

## IMPORTANT NOTICE

**THIS OFFERING IS AVAILABLE ONLY TO INVESTORS WHO ARE EITHER (1) BOTH QUALIFIED INSTITUTIONAL BUYERS UNDER RULE 144A AND QUALIFIED PURCHASERS AS DEFINED IN THE U.S. INVESTMENT COMPANY ACT OF 1940, AS AMENDED OR (2) NON-U.S. PERSONS OUTSIDE OF THE UNITED STATES UNDER REGULATIONS IN RELIANCE ON THE U.S. SECURITIES ACT OF 1933, AS AMENDED**

IMPORTANT: You must read the following before continuing. The following applies to the offering memorandum following this page (the “**Offering Memorandum**”), and you are therefore advised to read this carefully before reading, accessing or making any other use of the Offering Memorandum. In accessing the Offering Memorandum, you agree to be bound by the following terms and conditions, including any modifications to them any time you receive any information from us as a result of such access.

NOTHING IN THIS ELECTRONIC TRANSMISSION CONSTITUTES AN OFFER OF SECURITIES FOR SALE IN THE UNITED STATES OR ANY OTHER JURISDICTION WHERE IT IS UNLAWFUL TO DO SO. THE SECURITIES HAVE NOT BEEN, AND WILL NOT BE, REGISTERED UNDER THE UNITED STATES SECURITIES ACT OF 1933, AS AMENDED (THE “**SECURITIES ACT**”), OR THE SECURITIES LAWS OF ANY STATE OF THE UNITED STATES (THE “**UNITED STATES**” OR THE “**U.S.**”) OR OTHER JURISDICTION. THE SECURITIES MAY NOT BE OFFERED OR SOLD WITHIN THE UNITED STATES, OR TO, OR FOR THE ACCOUNT OR BENEFIT OF, U.S. PERSONS (AS DEFINED IN REGULATIONS UNDER THE SECURITIES ACT (“**REGULATION S**”)) EXCEPT PURSUANT TO AN EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND APPLICABLE STATE OR LOCAL SECURITIES LAWS.

THIS OFFERING MEMORANDUM MAY NOT BE FORWARDED OR DISTRIBUTED TO ANY OTHER PERSON AND MAY NOT BE REPRODUCED IN ANY MANNER WHATSOEVER, AND IN PARTICULAR, MAY NOT BE FORWARDED TO ANY ADDRESS IN THE UNITED STATES. ANY FORWARDING, DISTRIBUTION OR REPRODUCTION OF THIS DOCUMENT, IN WHOLE OR IN PART, IS UNAUTHORIZED. FAILURE TO COMPLY WITH THIS DIRECTIVE MAY RESULT IN A VIOLATION OF THE SECURITIES ACT OR THE APPLICABLE LAWS OF OTHER JURISDICTIONS.

**Confirmation of your Representation:** In order to be eligible to view the Offering Memorandum or make an investment decision with respect to the securities, investors must be either (1) both Qualified Institutional Buyers (“**QIBs**”) (within the meaning of Rule 144A under the Securities Act) and Qualified Purchasers (“**QPs**”) as defined in the United States Investment Company Act of 1940, as amended or (2) non-U.S. persons outside the United States in reliance on Regulation S under the Securities Act. The Offering Memorandum is being sent at your request and by accepting the e-mail and accessing the Offering Memorandum, you will be deemed to have represented to us that (1) you and any customers you represent are either (a) both QIBs and QPs or (b) non-U.S. persons outside of the United States and that the electronic mail address that you gave us and to which the Offering Memorandum has been delivered is not located in the United States and (2) you consent to delivery of the Offering Memorandum by electronic transmission.

IF ANY PERSON HOLDING AN INTEREST IN THE NOTES (AS DEFINED BELOW) IS NEITHER (1) A QIB WHO IS ALSO A QP AT THE TIME OF ACQUIRING THE NOTES NOR (2) A NON-U.S. PERSON OUTSIDE THE UNITED STATES, AS DEFINED IN REGULATIONS UNDER THE SECURITIES ACT, THE ISSUER MAY REGARD THE TRANSACTION WITH SUCH PERSON AS NULL AND VOID AND OF NO EFFECT. IN SUCH CIRCUMSTANCES, SUCH PERSON MAY BE FORCED TO TRANSFER OR SELL SUCH NOTES TO A PERMITTED TRANSFEREE MEETING THE REQUIREMENTS SET FORTH UNDER THE CAPTION “**TRANSFER RESTRICTIONS**” IN THIS OFFERING MEMORANDUM.

**MiFID II PRODUCT GOVERNANCE / TARGET MARKET:** The Pricing Supplement in respect of any Notes may include a legend entitled “**MiFID II Product Governance**” which will outline the target market assessment in respect of the Notes and which channels for distribution of the Notes are appropriate. Any person subsequently offering, selling or recommending the Notes (a “**distributor**”) should take into consideration the target market assessment; however, a distributor subject to Directive 2014/65/EU (as amended, “**MiFID II**”) is responsible for undertaking its own target market assessment in respect of the Notes and determining appropriate distribution channels.

A determination will be made in relation to each issue about whether, for the purpose of the MiFID Product Governance rules under EU Delegated Directive 2017/593 (the “**MiFID Product Governance Rules**”), any Dealer subscribing for any Notes is a manufacturer in respect of such Notes, but otherwise neither the Arrangers (as defined below) nor the Dealers nor any of their respective affiliates will be a manufacturer for the purpose of the MiFID Product Governance Rules.

**UK MiFIR PRODUCT GOVERNANCE / TARGET MARKET** – The Pricing Supplement in respect of any Notes may include a legend entitled “**UK MiFIR Product Governance**” which will outline the target market assessment in respect of the Notes and which channels for distribution of the Notes are appropriate. Any person subsequently offering, selling or recommending the Notes (a “**distributor**”) should take into consideration the target market assessment; however, a distributor subject to the FCA Handbook Product Intervention and Product Governance Sourcebook (the “**UK MiFIR Product Governance Rules**”) is responsible for undertaking its own target market assessment in respect of the Notes and determining appropriate distribution channels.

A determination will be made in relation to each issue about whether, for the purpose of the UK MiFIR Product Governance Rules, any Dealer subscribing for any Notes is a manufacturer in respect of such Notes, but otherwise neither the Arrangers nor the Dealers nor any of their respective affiliates will be a manufacturer for the purpose of the UK MiFIR Product Governance Rules.

**PROHIBITION OF SALES TO EEA RETAIL INVESTORS:** If the Pricing Supplement in respect of any Notes includes a legend entitled “**Prohibition of Sales to EEA Retail Investors**,” such Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the European Economic Area (the “**EEA**”). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client as defined in point (11) of Article 4(1) of MiFID II; or (ii) a customer within the meaning of Directive (EU) 2016/97 (the “**Insurance Distribution Directive**”), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (iii) not a qualified investor as defined in Regulation (EU) 2017/1129 (the “**Prospectus Regulation**”). Consequently, no key information document required by Regulation (EU) No 1286/2014 (as amended, the “**PRIIPs Regulation**”) for offering or selling the Notes or otherwise making them available to retail investors in the EEA will be prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

**PROHIBITION OF SALES TO UK RETAIL INVESTORS** – If the Pricing Supplement in respect of any Notes includes a legend entitled “**Prohibition of Sales to UK Retail Investors**”, such Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the United Kingdom (“**UK**”). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client, as defined in point (8) of Article 2 of Regulation (EU) No 2017/565 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018 (“**EUWA**”); (ii) a customer within the meaning of the provisions of the Financial Services and Markets

Act 2000 (the "FSMA") and any rules or regulations made under the FSMA to implement Directive (EU) 2016/97, where that customer would not qualify as a professional client, as defined in point (8) of Article 2(1) of Regulation (EU) No 600/2014 as it forms part of domestic law by virtue of the EUWA; or (iii) not a qualified investor as defined in Article 2 of Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA. Consequently no key information document required by Regulation (EU) No 1286/2014 as it forms part of domestic law by virtue of the EUWA (the "UK PRIIPs Regulation") for offering or selling the Notes or otherwise making them available to retail investors in the UK has been prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the UK may be unlawful under the UK PRIIPs Regulation. To the fullest extent permitted by law, none of the Dealers or the Arrangers accept any responsibility for the contents of the Offering Memorandum or for any other statements made or purported to be made by any Arranger or Dealer or on their behalf in connection with the Issuers or the Guarantor (each as defined in the Offering Memorandum) or the issue and offering of any securities. The materials relating to the offering of securities to which the Offering Memorandum relates do not constitute, and may not be used in connection with, an offer or solicitation in any place where offers or solicitations are not permitted by law. If a jurisdiction requires that the offering be made by a licensed broker or dealer and the underwriters or any affiliate of the underwriters is a licensed broker or dealer in that jurisdiction, the offering shall be deemed to be made by the underwriters or such affiliate on behalf of the relevant Issuer in such jurisdiction.

The Offering Memorandum has been sent to you in an electronic form. You are reminded that documents transmitted via this medium may be altered or changed during the process of electronic transmission and consequently none of the Issuers, the Guarantor, Merrill Lynch (Singapore) Pte. Ltd. and Standard Chartered Bank (the "Arrangers"), any Dealer (as defined in the Offering Memorandum), any person who controls any Arranger or Dealer (as defined in the Offering Memorandum), any director, officer, employee or agent of the Issuers, the Guarantor, the Arrangers or the Dealers, or affiliates of any such person accepts any liability or responsibility whatsoever in respect of any difference between the Offering Memorandum distributed to you in electronic format and the hard copy version available to you on request from the Arrangers or the Dealers.

You are responsible for protecting against viruses and other destructive items. Your use of this e-mail is at your own risk and it is your responsibility to take precautions to ensure that it is free from viruses and other items of a destructive nature.

## OFFERING MEMORANDUM



**GC TREASURY CENTER COMPANY LIMITED**  
(registered in the Kingdom of Thailand as a private company with limited liability)

Guaranteed by



**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED**  
(registered in the Kingdom of Thailand as a public company with limited liability)

### US\$2,000,000,000 Global Medium Term Note Program

Under the US\$2,000,000,000 Global Medium Term Note Program described in this Offering Memorandum (the “**Program**”), each of PTT Global Chemical Public Company Limited (the “**Company**”) and GC Treasury Center Company Limited (the “**Treasury Center**”), subject to compliance with all relevant laws, regulations and directives, may from time to time issue medium term notes. Each Series (as defined in “*Summary of the Program*”) of notes shall be issued either by (i) the Company (in its capacity as issuer, an “**Issuer**”) (the “**Direct Issuance Notes**”); or (ii) the Treasury Center (in its capacity as issuer, an “**Issuer**,” and together with the Company in its capacity as issuer, the “**Issuers**”); in the case of (ii), the notes shall be unconditionally and irrevocably guaranteed by the Company (in its capacity as guarantor, the “**Guarantor**”) (the “**Guaranteed Notes**” and, together with the Direct Issuance Notes, the “**Notes**”), subject to the Maximum Guaranteed Amount (as defined below).

Notes may only be issued in registered form. The aggregate nominal amount of Notes outstanding will not at any time exceed US\$2,000,000,000 (or its equivalent in other currencies, subject to any duly authorized increase). The Notes may be issued on a continuing basis to one or more of the Dealers specified under “*Summary of the Program*” or any additional Dealer appointed under the Program from time to time by the Company or the Treasury Center (each a “**Dealer**” and together the “**Dealers**”), which appointment may be for a specific issue or on an ongoing basis. References in this Offering Memorandum to the “**relevant Dealer**” shall, in the case of an issue of Notes being (or intended to be) purchased by more than one Dealer, be to all Dealers agreeing to purchase such Notes.

The guarantee of Guaranteed Notes (the “**Guarantee**”) constitutes a direct, unconditional, unsecured and unsubordinated obligation of the Guarantor, ranking at least *pari passu* with all other present and future unsecured and unsubordinated obligations of the Guarantor, save for such obligations as may be preferred by provisions of law that are both mandatory and of general application. In order to comply with applicable requirements of Thai law, the Indenture (as defined in “*Summary of the Program*”) will provide that the Guarantor’s maximum liability under the Guarantee will be capped at an amount equal to 125% of the outstanding aggregate principal amount of the relevant Series of Guaranteed Notes (the “**Maximum Guaranteed Amount**”). See “*Risk Factors—Risks Relating to the Guarantee.*”

Approval in-principle has been received from the Singapore Exchange Securities Trading Limited (the “**SGX-ST**”) for permission to deal in and for the listing and quotation of any Notes that are agreed at or prior to the time of issue thereof to be so listed on the SGX-ST. Such permission will be granted when such Notes have been admitted to the official list (the “**Official List**”) of the SGX-ST. Unlisted Series of Notes may also be issued pursuant to the Program. The relevant Pricing Supplement in respect of any Series of Notes will specify whether or not such Notes will be listed on the SGX-ST (or any other stock exchange). There is no assurance that an application to the SGX-ST for the listing of the Notes of any Series will be approved. Admission to the Official List of the SGX-ST and quotation of any Notes on the SGX-ST is not to be taken as an indication of the merits of the Issuers, the Guarantor, their respective subsidiary companies (if any), their respective associated companies (if any) or such Notes. The SGX-ST assumes no responsibility for the correctness of any of the statements made, opinions expressed or reports contained herein.

The Notes of each Series to be issued in registered form and which are sold in an “offshore transaction” within the meaning of Regulation S (“**Regulation S**”) under the United States Securities Act of 1933, as amended (the “**Securities Act**”) (“**Unrestricted Notes**”) will initially be represented by a registered global note certificate (each an “**Unrestricted Global Note Certificate**”) without interest coupons, which may be deposited on the relevant issue date (a) in the case of a Series intended to be cleared through Euroclear Bank SA/NV (“**Euroclear**”) and/or Clearstream Banking S.A. (“**Clearstream**”), with a common depository on behalf of Euroclear and Clearstream or (b) in the case of a Series intended to be cleared through The Depository Trust Company (“**DTC**”), registered in the name of Cede & Co. as nominee for DTC and (c) in the case of a Series intended to be cleared through a clearing system other than, or in addition to, Euroclear, Clearstream and/or DTC, or delivered outside a clearing system, as agreed among the relevant Issuer (in respect of each Series of Guaranteed Notes), the Guarantor and the relevant Dealer. Notes that are sold in the United States to investors who are both “qualified institutional buyers” (each, a “**QIB**”) within the meaning of Rule 144A (“**Rule 144A**”) under the Securities Act and “qualified purchasers” (each, a “**QP**”) as defined in the United States Investment Company Act of 1940, as amended (the “**U.S. Investment Company Act**”) (“**Restricted Notes**”) will initially be represented by a registered global note certificate (each a “**Restricted Global Note Certificate**”) and, together with the relevant Unrestricted Global Note Certificate, the “**Global Note Certificates**”), without interest coupons, which may be deposited on the relevant issue date with a custodian (the “**DTC Custodian**”) for, and registered in the name of Cede & Co. as nominee for, DTC or with a common depository on behalf of Euroclear and Clearstream. The provisions governing the exchange of interests in Global Notes for individual Note Certificates in registered form are described in “*Summary of Provisions Relating to the Notes while in Global Form.*”

The Notes and the Guarantee have not been, and will not be, registered under the Securities Act or the securities laws of any other jurisdiction. Subject to certain exceptions, the Notes and the Guarantee may not be offered or sold within the United States or to, or for the account of benefit of, U.S. persons. Accordingly, the Notes and the Guarantee may be offered and sold (i) in the United States (as defined in Regulation S) in registered form only to persons who are both QIBs and QPs in reliance on the exemption from the registration requirements of the Securities Act provided by Rule 144A and the exemption from the registration requirements of the U.S. Investment Company Act provided by Section 3(c)(7) of that act, and/or (ii) outside the United States to non-U.S. persons in offshore transactions in reliance on Regulation S under the Securities Act. Any Series of Notes and the Guarantee may be subject to additional selling restrictions. The applicable Pricing Supplement in respect of such Series of Notes will specify any such restrictions. See “*Subscription and Sale*” and the applicable Pricing Supplement.

Notes issued under the Program may be rated or unrated. When an issue of Notes is rated, its rating will not necessarily be the same as the rating applicable to the Program. A rating is not a recommendation to buy, sell or hold securities and may be subject to suspension, reduction, revision or withdrawal at any time by the assigning rating agency.

**Investing in Notes issued under the Program involves certain risks and may not be suitable for all investors. See “*Risk Factors*” beginning on page 9 for a discussion of factors that you should consider carefully before investing in the Notes.**

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#### Arrangers and Dealers

BofA Merrill Lynch

Standard Chartered Bank

The date of this Offering Memorandum is March 4, 2021.

## NOTICE TO INVESTORS

This Offering Memorandum is being furnished by us on a confidential basis in connection with an offering exempt from the registration requirements under the Securities Act, solely for the purpose of enabling a prospective investor to consider the purchase of the Notes. The Notes may be offered in reliance upon the exemptions from registration under the Securities Act. **The Notes have not been and will not be registered under the U.S. Securities Act or any state securities laws in the United States. Neither the Issuer nor the Guarantor is registered, nor will they register, under the U.S. Investment Company Act, and investors will not be entitled to the benefits of the U.S. Investment Company Act. Subject to certain exceptions, the Notes may not be offered or sold within the United States or to any national, resident or citizen of the United States. Pursuant to this offering, the Notes may not be offered or sold in the United States or to, or for the account or benefit of, U.S. persons as defined in Regulation S under the U.S. Securities Act, except that the Notes may be offered or sold to (a) persons who are both (i) “qualified institutional buyers,” as defined in Rule 144A under the U.S. Securities Act and (ii) “qualified purchasers,” as defined in the U.S. Investment Company Act, in reliance on the exemption from the registration requirements of the U.S. Securities Act provided by Rule 144A and the exemption from the registration requirements of the U.S. Investment Company Act provided by Section 3(c)(7) thereof and (b) non-U.S. persons in offshore transactions as defined under Regulation S. Prospective investors are hereby notified that sellers of the Notes may be relying on the exemption from the provisions of Section 5 of the Securities Act provided by Rule 144A.** Each purchaser of the Notes will be deemed to have made certain acknowledgments, representations and agreements regarding the Notes and the offer, sale, reoffer, pledge or other transfer of the Notes. See “*Transfer Restrictions.*”

Each Series (as defined herein) of Notes will be issued on the terms set out herein under “*Terms and Conditions of the Notes*” as amended and/or supplemented by the Pricing Supplement specific to such Series. This Offering Memorandum must be read and construed together with any amendments or supplements hereto and with any information incorporated by reference herein and, in relation to any Series of Notes, must be read and construed together with the relevant Pricing Supplement.

Distribution of this Offering Memorandum and any Pricing Supplement in whole or in part to any other person other than the prospective investor and any person retained to advise such prospective investor with respect to its purchase is unauthorized, and any disclosure of any of its contents, without our prior written consent, is prohibited. Each prospective investor, by accepting delivery of this Offering Memorandum and any Pricing Supplement, agrees to the foregoing and to make no photocopies of the whole or any part of this Offering Memorandum or any Pricing Supplement.

This Offering Memorandum and any Pricing Supplement do not constitute an offer to, and may not be used for the purpose of an offer to or a solicitation by, anyone in any jurisdiction or in any circumstances in which such an offer or solicitation is not authorized or is unlawful. No action has been or will be taken to permit a public offering of the Notes in any jurisdiction where action would be required for that purpose. The Notes may not be offered or sold, directly or indirectly, and neither this Offering Memorandum nor any Pricing Supplement may be distributed in any jurisdiction, except in accordance with the legal requirements applicable in such jurisdiction.

No person has been authorized to give any information or to make any representation other than those contained in this Offering Memorandum or any Pricing Supplement, and any information or representation not contained in this Offering Memorandum or any Pricing Supplement must not be relied upon as having been authorized by us, any of Merrill Lynch (Singapore) Pte. Ltd. and Standard Chartered Bank as the arrangers (the “**Arrangers**”) or the Dealers of the Program. Neither the delivery of this Offering Memorandum or any Pricing Supplement nor any sale of the Notes pursuant to the Program shall, under any circumstances, constitute a representation or create any implication that the information contained herein is correct as of any time subsequent to the date hereof or that there has been no change in the affairs of any party mentioned herein since that date.

No representation, warranty or undertaking, express or implied, is made by any of the Arrangers, the Dealers, the Trustee or the Agents (in such capacity) (each as defined herein), and no responsibility or liability is accepted by any thereof, as to the accuracy, adequacy, reasonableness or completeness of the information contained in this Offering Memorandum or any other information provided by us in connection with the Issuers, the Guarantor or the Notes, their distribution or their future performance. The Arrangers and the Dealers accordingly disclaim all and any liability whether arising in tort or contract or otherwise (save as referred to above) which they might otherwise have in respect of any such information.

Neither this Offering Memorandum, any Pricing Supplement nor any other information supplied in connection with the Notes should be considered as a recommendation by us, the Arrangers, the Dealers, the

Trustee or the Agents (each as defined herein) that any recipient of this Offering Memorandum or any Pricing Supplement should purchase any of the Notes. Each investor contemplating purchasing any Notes should make its own independent investigation of our business, financial condition and affairs, and its own appraisal of our creditworthiness.

To the best of its knowledge, having made all reasonable enquiries, each of the Company and the Treasury Center confirms that (i) this Offering Memorandum (as may be supplemented from time to time) contains all information with respect to the Issuers, the Guarantor and the Notes which are material in the context of the offering of the Notes under the Program; (ii) the statements contained herein (as may be supplemented from time to time) relating to the Issuers, the Guarantor and the Notes are true and accurate in all material respects and not misleading; (iii) the opinions and intentions expressed in this Offering Memorandum (as may be supplemented from time to time) with regard to the Issuers and the Guarantor are honestly held, have been reached after considering all relevant circumstances and are based on reasonable assumptions; and (iv) there are no other facts in relation to the Issuers, the Guarantor or the Notes the omission of which would, in the context of the offering of the Notes under the Program, make any statement in this Offering Memorandum (as may be supplemented from time to time) misleading in any material respect.

**THE NOTES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE UNITED STATES SECURITIES AND EXCHANGE COMMISSION (THE “SEC”), ANY STATE SECURITIES COMMISSION IN THE UNITED STATES OR ANY OTHER U.S. REGULATORY AUTHORITY, NOR HAVE ANY OF THE FOREGOING AUTHORITIES PASSED UPON OR ENDORSED THE MERITS OF THE OFFERING OF THE NOTES OR THE ACCURACY OR ADEQUACY OF THIS OFFERING MEMORANDUM. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE IN THE UNITED STATES.**

In connection with the issue of any Series of Notes, the Dealer(s) (if any) named as the stabilizing manager(s) or persons acting on behalf of any Stabilizing Manager(s)) (the “**Stabilizing Manager(s)**”) may over-allot the Notes or effect transactions with a view to supporting the price of the Notes at a level higher than that which might otherwise prevail for a limited period after the issue date of the Notes. However, there is no obligation on such Stabilizing Manager(s) to do this. Such stabilizing, if commenced, may be discontinued at any time, and must be brought to an end after a limited period. Such stabilizing shall be in compliance with all applicable laws, regulations and rules.

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#### **DISCLOSURE OF INVESTORS IN COMPLIANCE WITH THAI SEC REQUIREMENTS**

The Securities and Exchange Commission of Thailand will require the Dealers to disclose the identity of investors in the Notes in accordance with applicable regulation.

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#### **NOTICE TO PROSPECTIVE INVESTORS IN THE UNITED KINGDOM**

The Notes may not be offered or sold to any person in the United Kingdom, other than to persons whose ordinary activities involve them acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of their businesses or who it is reasonable to expect will acquire, hold, manage or dispose of investments (as principal or agent) for the purposes of their businesses or otherwise in circumstances which have not resulted and will not result in an offer to the public in the United Kingdom.

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#### **MIFID II PRODUCT GOVERNANCE / TARGET MARKET**

The Pricing Supplement in respect of any Notes may include a legend entitled “MiFID II Product Governance” which will outline the target market assessment in respect of the Notes and which channels for distribution of the Notes are appropriate. Any person subsequently offering, selling or recommending the Notes (a “**distributor**”) should take into consideration the target market assessment; however, a distributor subject to Directive 2014/65/EU (as amended, “**MiFID II**”) is responsible for undertaking its own target market assessment in respect of the Notes and determining appropriate distribution channels.

A determination will be made in relation to each issue about whether, for the purpose of the MiFID Product Governance rules under EU Delegated Directive 2017/593 (the “**MiFID Product Governance Rules**”), any Dealer subscribing for any Notes is a manufacturer in respect of such Notes, but otherwise neither the Arrangers nor the Dealers nor any of their respective affiliates will be a manufacturer for the purpose of the MiFID Product Governance Rules.

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### **UK MiFIR PRODUCT GOVERNANCE / TARGET MARKET**

The Pricing Supplement in respect of any Notes may include a legend entitled “UK MiFIR Product Governance” which will outline the target market assessment in respect of the Notes and which channels for distribution of the Notes are appropriate. Any person subsequently offering, selling or recommending the Notes (a “**distributor**”) should take into consideration the target market assessment; however, a distributor subject to the FCA Handbook Product Intervention and Product Governance Sourcebook (the “**UK MiFIR Product Governance Rules**”) is responsible for undertaking its own target market assessment in respect of the Notes and determining appropriate distribution channels.

A determination will be made in relation to each issue about whether, for the purpose of the UK MiFIR Product Governance Rules, any Dealer subscribing for any Notes is a manufacturer in respect of such Notes, but otherwise neither the Arrangers nor the Dealers nor any of their respective affiliates will be a manufacturer for the purpose of the UK MiFIR Product Governance Rules.

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### **PRIIPs / IMPORTANT – EEA RETAIL INVESTORS**

If the Pricing Supplement in respect of any Notes includes a legend entitled “Prohibition of Sales to EEA Retail Investors,” the Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the European Economic Area (the “**EEA**”). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client as defined in point (11) of Article 4(1) of Directive 2014/65/EU (as amended, “**MiFID II**”); or (ii) a customer within the meaning of Directive (EU) 2016/97 (the “**Insurance Distribution Directive**”), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (iii) not a qualified investor as defined in Regulation (EU) 2017/1129 (as amended, the “**Prospectus Regulation**”). Consequently, no key information document required by Regulation (EU) No 1286/2014 (as amended the “**PRIIPs Regulation**”) for offering or selling the Notes or otherwise making them available to retail investors in the EEA will be prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

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### **PRIIPs / IMPORTANT – UK RETAIL INVESTORS**

If the Pricing Supplement in respect of any Notes includes a legend entitled “Prohibition of Sales to UK Retail Investors”, such Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the United Kingdom (“**UK**”). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client, as defined in point (8) of Article 2 of Regulation (EU) No 2017/565 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018 (“**EUWA**”); (ii) a customer within the meaning of the provisions of the FSMA and any rules or regulations made under the FSMA to implement Directive (EU) 2016/97, where that customer would not qualify as a professional client, as defined in point (8) of Article 2(1) of Regulation (EU) No 600/2014 as it forms part of domestic law by virtue of the EUWA; or (iii) not a qualified investor as defined in Article 2 of Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA. Consequently no key information document required by Regulation (EU) No 1286/2014 as it forms part of domestic law by virtue of the EUWA (the “**UK PRIIPs Regulation**”) for offering or selling the Notes or otherwise making them available to retail investors in the UK has been prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the UK may be unlawful under the UK PRIIPs Regulation.

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**NOTIFICATION UNDER SECTION 309B(1)(C) OF THE SECURITIES AND FUTURES ACT  
(CHAPTER 289 OF SINGAPORE)**

Unless otherwise stated in the Pricing Supplement in respect of any Notes, all Notes issued or to be issued under the Program shall be prescribed capital market products (as defined in the Securities and Futures (Capital Markets Products) Regulations 2018) and Excluded Investment Products (as defined in MAS Notice SFA 04-N12: Notice on the Sale of Investment Products and MAS Notice FAA-N16: Notice on Recommendations on Investment Products).

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**NOTICE TO RESIDENTS OF THAILAND**

**THE NOTES HAVE NOT BEEN, AND WILL NOT BE, REGISTERED WITH THE THAI SEC. ANY OFFERING, SOLICITATIONS OR DISTRIBUTION, AS PRESCRIBED UNDER THAI LAWS AND REGULATIONS, OF THE NOTES IN THAILAND IS NOT LEGAL WITHOUT SUCH PRIOR REGISTRATION. DOCUMENTS RELATING TO THE OFFERING OF THE NOTES, AS WELL AS INFORMATION CONTAINED THEREIN, MAY NOT BE DISTRIBUTED IN OR SENT TO THAILAND, AS THE OFFERING OF THE NOTES IS NOT AN OFFERING OF SECURITIES IN THAILAND, NOR MAY THEY BE USED IN CONNECTION WITH ANY OFFER FOR SUBSCRIPTION OR SALE OF THE NOTES IN THAILAND.**

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**SERVICE OF PROCESS AND ENFORCEMENT OF CIVIL LIABILITIES**

The Company is a limited liability public company and the Treasury Center is a private limited liability company, both organized under the laws of Thailand. Substantially all of our directors and officers (and our auditors) are residents of Thailand and a substantial portion of our assets and the assets of our officers and directors are located in Thailand. As a result, it may not be possible for investors to effect service of process upon us or such persons outside Thailand, or to enforce judgments against us or such persons obtained in courts outside Thailand predicated upon civil liabilities of ours or such directors and officers under laws other than Thailand, including any judgment predicated upon United States federal securities laws. We have been advised by Baker & McKenzie Ltd., our Thai counsel, that a judgment or order obtained in a court outside Thailand would not be enforced as such by the courts of Thailand, but such judgment or order in the discretion of the courts of Thailand may be admitted as evidence of any obligation in new proceedings instituted in the courts of Thailand, which would consider the issue on the evidence before it.

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**CERTAIN DEFINED TERMS AND CONVENTIONS**

As used in this Offering Memorandum, unless the context otherwise requires, the terms “we,” “us,” “our,” “Group” and “GC” refer to PTT Global Chemical Public Company Limited and its consolidated subsidiaries (including the Treasury Center). The terms “Company” and “Treasury Center” refer to each of PTT Global Chemical Public Company Limited and GC Treasury Center Company Limited, respectively, on a standalone basis, unless the context requires otherwise.

In this Offering Memorandum, references to an “Issuer” or the “relevant Issuer” shall be either to the Company or the Treasury Center in their respective capacities as issuers under the Program, as the context requires, and references to the “Issuers” shall be to each Issuer collectively. References to the “Guarantor” shall be to the Company in its capacity as guarantor in respect of each Series of Guaranteed Notes.

The term “PTT” refers to PTT Public Company Limited and “PTT Group” refers to all the group companies under PTT, which include us.

In this Offering Memorandum, references to “US\$,” “\$” and “U.S. dollars” are to United States dollars, the legal currency of the United States, references to “THB,” “Baht” and “Thai Baht” are to the legal currency of the Kingdom of Thailand and references to “S\$” are to Singaporean dollars, the legal currency of Singapore. Unless otherwise specified or the context otherwise requires, all references to “Thai” and “Thailand” are

references to the Kingdom of Thailand. All references to the “Government” and “Thai government” herein are references to the Government of the Kingdom of Thailand. All references to “United States” and “U.S.” herein are references to the United States of America. Certain terms used herein are defined in the “*Glossary of Technical Terms*” contained elsewhere in this Offering Memorandum.

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## PRESENTATION OF FINANCIAL AND OTHER INFORMATION

### Exchange Rate Information

We publish our financial statements in Baht. Solely for convenience, this Offering Memorandum contains translations of certain Baht amounts into U.S. dollars at the exchange rate of THB30.01 = US\$1.00, which was the weighted-average interbank exchange rate announced by the Bank of Thailand (“BOT”) as of December 30, 2020 (the last day in December that such rate was published). These translations should not be construed as representations that the Baht amounts represent such U.S. dollar amounts or could be, or could have been, converted into U.S. dollars at the rates indicated or at all.

### Presentation of Financial Information

This Offering Memorandum contains our audited financial statements as of and for the year ended December 31, 2019, including comparative information presented as corresponding figures as of and for the year ended December 31, 2018, and our audited financial statements as of and for the year ended December 31, 2020, including comparative information presented as corresponding figures as of the for the year ended December 31, 2019. These financial statements have been prepared in accordance with Thai Financial Reporting Standards (“TFRS”), which are aligned with, but not identical to, International Financial Reporting Standards (“IFRS”). See “*Summary of Principal Differences Between TFRS and IFRS.*”

Effective January 1, 2020, we adopted TFRS 9 (Financial Instruments) and TFRS 16 (Leases) which resulted in changes in our accounting policy for fair value measurement of financial instruments and for leases (specifically for those leases formerly classified as operating and finance lease arrangements where we are the lessee), respectively. As a result of the implementation of TFRS 16, a lessee is required to recognize a right-of-use asset and a lease liability at the commencement of all leases, except for short-term leases and leases of low value assets. The impact of the adoption of TFRS 16 and our policies on the application of TFRS 16 are discussed further in Notes 2.6, 3.11 and 15 to our audited financial statements included elsewhere in this Offering Memorandum.

Except as otherwise indicated or the context otherwise requires, financial information in this Offering Memorandum is presented on a consolidated basis.

### Rounding

Rounding adjustments have been made in calculating some of the financial information included in this Offering Memorandum. As a result, numerical figures shown as totals in some tables may not be exact arithmetic aggregations of the figures that precede them.

### Operating Data and Non-TFRS Financial Measures

This Offering Memorandum includes certain operating and non-TFRS financial measures for GC. The non-TFRS financial measures include ADJUSTED EBITDA, ADJUSTED EBITDA margin, total debt to ADJUSTED EBITDA, net debt to ADJUSTED EBITDA and ADJUSTED EBITDA to finance costs. These measures are supplemental measures of performance and liquidity that are not required by, or presented in accordance with, TFRS or IFRS and should not be considered as an alternative to net income, operating income or any other performance measures derived in accordance with TFRS or IFRS or as an alternative to cash flow from operating activities or as a measure of liquidity. In addition, ADJUSTED EBITDA, ADJUSTED EBITDA margin, total debt to ADJUSTED EBITDA, net debt to ADJUSTED EBITDA and ADJUSTED EBITDA to finance costs are not standardized. Therefore, a direct comparison between companies using such measures may not be possible.

This Offering Memorandum also includes certain operating measures including utilization rates, distillation intake capacity, nameplate capacity, capacity utilization rates for our plants, gross refining margin and



product-to-feedstock margin, which are supplemental measures of our performance. As used in this Offering Memorandum, distillation intake capacity with respect to our refinery business unit refers to the total intake capacity of our refinery, which included, as of December 31, 2020, crude oil feed of 145,000 barrels per day and condensate feed of 135,000 barrels per day. The nameplate capacity with respect to other petrochemical products refers to the announced capacity of our plants based on technology licenses and/or production rates guaranteed by the construction contractor, as adjusted by upgrades or improvements. Capacity utilization rates refer to the actual total production expressed as a percentage of nameplate capacity during the relevant period. These operating measures are not standardized and a direct comparison between companies using such measures may not be possible.

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## AVAILABLE INFORMATION

While any Notes remain outstanding, we shall, during any period in which we are not subject to Section 13 or 15(d) of the U.S. Securities Exchange Act of 1934, as amended (the “**Exchange Act**”), or exempt from reporting pursuant to Rule 12g3-2(b) under the Exchange Act, make available to any qualified institutional buyer (as defined in Rule 144A) who is a holder and any prospective purchaser of a Note who is a qualified institutional buyer (as so defined) designated by such holder, upon the request of such holder or prospective purchasers, the information concerning us required to be provided to such holder or prospective purchaser by Rule 144A(d)(4) under the Securities Act.

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## FORWARD-LOOKING STATEMENTS

We have included statements in this Offering Memorandum which contain words or phrases such as “will,” “would,” “aimed,” “is likely,” “are likely,” “expected to,” “will continue,” “anticipated,” “estimate,” “intended,” “plan,” “contemplated,” “seeking to,” “target,” “propose to,” “future,” “objective,” “goal,” “project,” “should,” “can,” “could,” “may” and similar expressions or variations of such expressions, that are “forward-looking statements.” Although our management believes that its expectations as reflected by such forward-looking statements are reasonable based on information currently available to us, actual results may differ materially from those suggested by the forward-looking statements due to certain risks or uncertainties associated with our expectations with respect to, but not limited to:

- fluctuations in prices of refinery and petrochemical products or feedstock;
- continued availability of capital and financing;
- interest rates and foreign exchange rates;
- value added tax and other taxes and duties;
- our fixed obligations;
- our competitive environment;
- the financial health of our principal offtake and other domestic petrochemical customers;
- the extension or renewal of our feedstock, offtake, utility and other contractual arrangements;
- general economic and business conditions and petrochemical demand and supply in Thailand, Asia and the countries and regions in which we conduct our business;
- technical difficulties in the operation of our plants reducing expected levels of output and efficiency, including unplanned plant shutdowns;
- delays, cost overruns, shortages in materials or labor, defects in design or construction or other problems with construction of our proposed plants expansions;
- receipt of Government approvals and licenses for our other proposed plant expansions;
- our ability to develop new products and technologies successfully;

- our ability to successfully grow through strategic acquisitions and joint ventures;
- the cyclical and highly competitive nature of our business;
- significant capital expenditures required for plant maintenance and debottlenecking;
- our ability to realize anticipated synergies and cost savings;
- our dependence on principal customers and feedstock suppliers;
- unanticipated future regulatory restrictions in the refinery and/or petrochemical industry;
- liability for remedial actions under environmental regulations;
- political, economic and social developments in Thailand, Asia, the Middle East and the countries and regions in which we conduct our business;
- the cost and availability of adequate insurance coverage;
- any outbreak of severe communicable diseases, including the COVID-19 pandemic, and measures taken in response thereto; and
- other factors beyond our control.

For a further discussion of the factors that could cause our actual results to differ, see the discussion under “*Risk Factors*.” The risks described in the “*Risk Factors*” section in this Offering Memorandum are not exhaustive. Other sections of this Offering Memorandum describe additional factors that could adversely affect our business, financial condition or results of operations. No assurances can be given that such expectations will prove to be correct. Moreover, we operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time and it is not possible for us to predict all such risk factors, nor can we assess the impact of all such risk factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements. Given these risks and uncertainties, you should carefully review forward-looking statements as a prediction of actual results, which could differ materially from those contemplated in the relevant forward-looking statement. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

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## HISTORICAL AND CURRENT MARKET AND INDUSTRY DATA

Historical and current market data used throughout this Offering Memorandum were obtained from internal company analyses, consultants’ reports and industry publications. In particular, information has been provided by IHS Markit. Industry surveys and publications generally state that the information contained therein has been obtained from sources believed to be reliable, but the accuracy and completeness of information contained in consultants’ reports and industry publications is not guaranteed. Neither we nor the Arrangers and Dealers have independently verified this market data. Similarly, internal company analyses, while believed by us to be reliable, have not been verified by any independent sources, and neither we nor any of the Arrangers and Dealers make any representation as to the accuracy of such information. While we are not aware of any misstatements regarding any industry or similar data presented herein, such data involve risks and uncertainties and are subject to change based on various factors, including those discussed under the “*Risk Factors*” section in this Offering Memorandum. As a result, you should not place undue reliance on such information.

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This Offering Memorandum should be read and construed in conjunction with each relevant Pricing Supplement, the most recently published audited annual accounts and any interim accounts (whether audited or unaudited) published subsequently to our annual accounts from time to time (if any) and all amendments and supplements from time to time to this Offering Memorandum that are appended to or circulated with this Offering Memorandum, which shall form part of this Offering Memorandum and which shall be deemed to modify or supersede the contents of this Offering Memorandum to the extent that a statement contained in any such document is inconsistent with this Offering Memorandum. Copies of these documents shall be available for inspection at the specified offices of the Paying Agent set out at the end of this Offering Memorandum during normal business hours (being between 9:00 a.m. and 3:00 p.m. (London time)) on any weekday (Saturdays and public holidays excepted) following prior written notice and proof of holding and identity satisfactory to the Paying Agent.

Any published unaudited interim financial statements which are, from time to time, appended to or circulated with this Offering Memorandum, will not have been audited by our auditors. Accordingly, there can be no assurance that, had an audit been conducted in respect of such financial statements, the information presented therein would not have been materially different, and investors should not place undue reliance upon them.

## TABLE OF CONTENTS

	Page
SUMMARY OF THE PROGRAM .....	1
SUMMARY CONSOLIDATED FINANCIAL AND OTHER DATA .....	6
RISK FACTORS .....	10
USE OF PROCEEDS .....	35
CAPITALIZATION AND INDEBTEDNESS.....	36
SELECTED CONSOLIDATED FINANCIAL AND OTHER DATA .....	37
MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS .....	41
INDUSTRY OVERVIEW.....	67
CORPORATE HISTORY AND CORPORATE STRUCTURE.....	101
DESCRIPTION OF THE TREASURY CENTER .....	108
BUSINESS.....	109
MANAGEMENT .....	139
PRINCIPAL SHAREHOLDERS .....	153
FORM OF THE NOTES.....	154
TERMS AND CONDITIONS OF THE NOTES .....	156
SUMMARY OF PROVISIONS RELATING TO THE NOTES WHILE IN GLOBAL FORM.....	191
FORM OF PRICING SUPPLEMENT .....	194
CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS .....	205
DESCRIPTION OF OTHER MATERIAL INDEBTEDNESS .....	207
TAXATION.....	210
CLEARANCE AND SETTLEMENT .....	219
SUBSCRIPTION AND SALE .....	222
TRANSFER RESTRICTIONS.....	229
ERISA CONSIDERATIONS.....	233
SUMMARY OF PRINCIPAL DIFFERENCES BETWEEN TFRS AND IFRS .....	236
LEGAL MATTERS .....	238
INDEPENDENT AUDITORS .....	239
GLOSSARY OF TECHNICAL TERMS .....	240
INDEX TO THE FINANCIAL STATEMENTS .....	F-1

## SUMMARY OF THE PROGRAM

*This summary must be read as an introduction to this Offering Memorandum and any decision to invest in the Notes should be based on a consideration of the Offering Memorandum as a whole, including any information incorporated by reference. Some of the terms described below are subject to important limitations and exceptions. Words and expressions defined in the “Terms and Conditions of the Notes” below or elsewhere in this Offering Memorandum have the same meanings in this summary. For a more complete description of the terms and conditions of the Notes, see “Terms and Conditions of the Notes” in this Offering Memorandum.*

<b>Issuers</b> .....	PTT Global Chemical Public Company Limited (in respect of Direct Issuance Notes) and GC Treasury Center Company Limited (in respect of Guaranteed Notes).
<b>Guarantor (in respect of Guaranteed Notes)</b> .....	PTT Global Chemical Public Company Limited.
<b>Guarantee</b> .....	The Guarantor will, in respect of a Series of Guaranteed Notes, fully, irrevocably and unconditionally guarantee the due and punctual payment of premium (if any) and interest in respect of or on, and all other amounts payable under, such Series of Guaranteed Notes (and any Additional Amounts), subject to the Maximum Guaranteed Amount and the amended and restated indenture dated March 4, 2021 (the “ <b>Indenture</b> ”), expressed to be payable by the Treasury Center. The Guarantor’s maximum liability under the Guarantee will be capped at the Maximum Guaranteed Amount.
<b>Program Size</b> .....	Up to US\$2,000,000,000 (or the equivalent in other currencies calculated as described in the Dealer Agreement (as defined in “ <i>Subscription and Sale</i> ”)) outstanding at any time. The Issuers and the Guarantor may increase the amount of the Program in accordance with the terms of the Dealer Agreement.
<b>Arrangers</b> .....	Merrill Lynch (Singapore) Pte. Ltd. and Standard Chartered Bank.
<b>Dealers</b> .....	The Arrangers and any other Dealers appointed from time to time by the Issuers or the Guarantor (as the case may be) either generally in respect of the Program or in relation to a particular Series of Notes.
<b>Principal Paying Agent and Paying Agent</b> .....	Citibank, N.A., London Branch.
<b>Registrar and Transfer Agent</b> .....	Citibank, N.A., London Branch.
<b>Exchange Agent</b> .....	Citibank, N.A., London Branch.
<b>Trustee</b> .....	Citicorp International Limited.
<b>Method of Issue</b> .....	The Notes will be issued on a syndicated or non-syndicated basis. The Notes will be issued in series (each a “ <b>Series</b> ”) having one or more issue dates and on terms otherwise identical (or identical other than in respect of the first payment of interest and their issue price), and intended to be interchangeable with all other Notes of that Series. Each Series may be issued in tranches (each a “ <b>Tranche</b> ”) on the same or different issue dates. The specific terms of each Tranche (which will be completed, where necessary, with the relevant terms and conditions and, save in respect of the issue date, issue price, first payment date of interest and nominal amount of the Tranche, will be identical to the terms of other Tranches of the same Series) will be completed in the Pricing Supplement.
<b>Clearing Systems</b> .....	Euroclear, Clearstream and/or DTC and such other clearing system as shall be agreed between the relevant Issuer, (in respect of each Series

of Guaranteed Notes) the Guarantor, the Trustee, the Agents and the relevant Dealer(s).

**Form of the Notes** .....

Notes may only be issued in registered form.

Each Series of Notes, which are sold outside the United States in reliance on Regulation S, will, unless otherwise specified in the applicable Pricing Supplement, be represented by a Global Note Certificate (as defined in the “*Form of the Notes*”), which will be deposited on or about its issue date with a common depository for, and registered in the name of a nominee of, Euroclear and Clearstream, or with a custodian for, and registered in the name of a nominee of, DTC for the accounts of Euroclear and Clearstream. With respect to all offers or sales by a Dealer of an unsold allotment or subscription, beneficial interests in a Global Note Certificate of such Series may be held only through Euroclear, Clearstream, DTC for the accounts of Euroclear and Clearstream. Regulation S Global Note Certificates will be exchangeable for Definitive Notes only upon the occurrence of an Exchange Event as described in “*Form of the Notes*.”

Each Tranche of Notes sold to persons who are both QIBs and QPs in compliance with Rule 144A and subject to the restrictions described in “*Transfer Restrictions*” and “*Subscription and Sale*” and the applicable Pricing Supplement will, unless otherwise specified in the applicable Pricing Supplement, be represented by a Rule 144A Global Note Certificate, which will be deposited on or about its issue date with a custodian for, and registered in the name of a nominee of, DTC. Rule 144A Global Note Certificates will be exchangeable for Definitive Notes only upon the occurrence of an Exchange Event as described in “*Form of the Notes*.”

Application will be made to have Global Note Certificates of any Series accepted for clearance and settlement through the facilities of DTC, Euroclear and/or Clearstream, as appropriate.

**Currencies** .....

Notes may be denominated in any currency or currencies, agreed between the relevant Issuer, (in respect of a Series of Guaranteed Notes) the Guarantor and the relevant Dealer(s) subject to compliance with all applicable legal and/or regulatory and/or central bank requirements. Payments in respect of Notes may, subject to such compliance, be made in and/or linked to, any currency or currencies other than the currency in which such Notes are denominated.

**Denominations** .....

Notes will be issued in such denominations as may be specified in the relevant Pricing Supplement, subject to compliance with all applicable legal and/or regulatory and/or central bank requirements.

**Status of the Notes** .....

The Notes will constitute direct, unconditional, unsubordinated and (subject to Condition 5(a) (*Certain Covenants—Limitation on Liens*)) unsecured obligations of the relevant Issuer which will at all times rank *pari passu* among themselves and at least *pari passu* with all other present and future unsecured and unsubordinated obligations of the relevant Issuer, save for such obligations as may be preferred by provisions of law that are both mandatory and of general application. See “*Terms and Conditions of the Notes—Status*.”

**Status of the Guarantee**.....

The Guarantee will constitute a direct, unconditional, unsubordinated and unsecured obligation of the Guarantor and will rank at least *pari passu* with all other present and future unsecured and unsubordinated obligations of the Guarantor, save for such obligations as may be preferred by provisions of law that are both mandatory and of general application. Notwithstanding anything to the contrary, the Guarantor’s

	<p>maximum liability under the Guarantee in respect of each Series of Guaranteed Notes will be capped at the Maximum Guaranteed Amount.</p>
<b>Issue Price</b> .....	<p>Notes may be issued at their nominal amount or at a discount or premium to their nominal amount. Partly Paid Notes may be issued, the issue price of which will be payable in two or more installments.</p>
<b>Maturities</b> .....	<p>Any maturity, subject, in relation to specific currencies, to compliance with all applicable legal and/or regulatory and/or central bank requirements.</p> <p>Where Notes have a maturity of less than one year and either (a) the issue proceeds are received by the relevant Issuer in the United Kingdom or (b) the activity of issuing the Notes is carried on from an establishment maintained by the relevant Issuer in the United Kingdom, such Notes must: (i) have a minimum redemption value of £100,000 (or its equivalent in other currencies) and be issued only to persons whose ordinary activities involve them in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of their businesses or who it is reasonable to expect will acquire, hold, manage or dispose of investments (as principal or agent) for the purposes of their businesses; or (ii) be issued in other circumstances which do not constitute a contravention of section 19 of the Financial Services and Markets Act 2000 (“FSMA”) by the Issuers or the Guarantor.</p>
<b>Redemption</b> .....	<p>Notes may be redeemable at par or at such other Redemption Amount (detailed in a formula, index or otherwise) as may be specified in the relevant Pricing Supplement. Notes may also be redeemable in two or more installments on such dates and in such manner as may be specified in the relevant Pricing Supplement.</p>
<b>Optional Redemption</b> .....	<p>If specified in the relevant Pricing Supplement, Notes may be redeemed before their stated maturity at the option of the relevant Issuer (either in whole or in part) as described in Condition 10(c) (<i>Redemption and Purchase—Optional Redemption</i>).</p>
<b>Tax Redemption</b> .....	<p>Except as described in “<i>Optional Redemption</i>” above, early redemption of Notes will only be permitted for tax reasons as described in Condition 10(b) (<i>Redemption and Purchase—Optional Tax Redemption</i>).</p>
<b>Interest</b> .....	<p>Notes may be interest-bearing or non-interest-bearing. Interest (if any) may accrue at a fixed rate or a floating rate or other variable rate or be index linked and the method of calculating interest may vary between the issue date and the maturity date of the relevant Series. All such information will be set out in the relevant Pricing Supplement.</p>
<b>Certain Covenants</b> .....	<p>Each of the Issuers and the Guarantor has covenanted in Condition 5 (<i>Certain Covenants</i>) with certain limitations and exceptions, not to incur certain liens or consolidate, merge or sell all or substantially all of its property or assets unless certain conditions are satisfied.</p>
<b>Maximum Guaranteed Amount</b> .....	<p>In order to comply with applicable requirements of Thai law, the Guarantor’s maximum liability under the Guarantee will be capped at an amount equal to 125% of the outstanding aggregate principal amount of the relevant Series of Guaranteed Notes.</p>

<b>Increase in Interest Rate Payable Upon the Occurrence of a Change of Control Triggering Event</b> .....	The interest rate payable on the Notes will be subject to an increase of 1.25% upon the occurrence of a Change of Control Triggering Event.
<b>Cross Default</b> .....	The Notes will contain a cross default provision as further described in Condition 13 ( <i>Events of Default</i> ).
<b>Withholding Tax</b> .....	See Condition 10(b) ( <i>Redemption and Purchase — Optional Tax Redemption</i> ) and Condition 12 ( <i>Additional Amounts</i> ).
<b>Listing and Trading</b> .....	<p>Approval in-principle has been received from the SGX-ST for permission to deal in and for the listing and quotation of Notes that may be issued pursuant to the Program and which are agreed at or prior to the time of issue thereof to be so listed on the SGX-ST. The Notes may also be listed on such other or further stock exchange(s) as may be agreed between the relevant Issuer, (in respect of each Series of Guaranteed Notes) the Guarantor and the relevant Dealer in relation to each Series. Unlisted Series of Notes may also be issued pursuant to the Program. The relevant Pricing Supplement in respect of any Series of the Notes will specify whether or not such Notes will be listed and, if so, on which exchange(s) the Notes are to be listed. There is no assurance that an application to the Official List of the SGX-ST for the listing of the Notes of any Series will be approved. If approval in-principle is received from the SGX-ST in relation to the Notes of any Series to be listed on the SGX-ST, such Notes will be traded on the SGX-ST in a minimum board lot size of at least S\$200,000 (or its equivalent in foreign currencies) following listing, for so long as such Notes are listed on the Official List of the SGX-ST and the rules of the SGX-ST so require.</p> <p>For so long as any Notes are listed on the SGX-ST and the rules of the SGX-ST so require, the Issuers and the Guarantor shall appoint and maintain a paying agent in Singapore, where such Notes may be presented or surrendered for payment or redemption, in the event that the Global Notes representing such Notes are exchanged for Definitive Notes. In addition, in the event that the Global Notes are exchanged for Definitive Notes, an announcement of such exchange will be made by or on behalf of the relevant Issuer and the Guarantor through the SGX-ST and such announcement will include all material information with respect to the delivery of the definitive notes, including details of the paying agent in Singapore.</p>
<b>Governing Law</b> .....	The Notes, the Guarantee and the Indenture will be governed by, and construed in accordance with, the laws of the State of New York.
<b>Rating</b> .....	<p>Notes issued under the Program may be rated or unrated, as specified in the applicable Pricing Supplement.</p> <p>A rating is not a recommendation to buy, sell or hold securities and may be subject to suspension, reduction, revision or withdrawal at any time by the assigning rating agency.</p>
<b>Selling Restrictions</b> .....	For a description of certain restrictions on offers, sales and deliveries of Notes and on the distribution of offering materials in the United States of America, the European Economic Area, the United Kingdom, the PRC, Hong Kong, Japan, Singapore and Thailand, see “ <i>Subscription and Sale</i> ” below.



In connection with the offering and sale of a particular Series of Notes, additional restrictions may be imposed which will be set out in the applicable Pricing Supplement.

**Transfer Restrictions**..... There are restrictions on the transfer of Notes sold pursuant to Regulation S under the Securities Act prior to the expiration of the relevant distribution compliance period and on the transfer of Notes sold pursuant to Rule 144A under the Securities Act. See “*Transfer Restrictions*.” The Notes may not, either directly or indirectly, be resold, pledged or otherwise transferred in Thailand.

**Initial Delivery of Notes** ..... On or before the issue date for each Series, the Global Note Certificate representing Notes may be deposited with a common depository for Euroclear and Clearstream or registered in the name of a nominee of DTC and deposited on or about the issue date or any other clearing system or may be delivered outside any clearing system *provided that* the method of such delivery has been agreed in advance by the relevant Issuer, (in respect of each Series of Guaranteed Notes) the Guarantor, the Trustee, the Principal Paying Agent and the relevant Dealer(s). Notes that are to be credited to one or more clearing systems on issue will be registered in the name of, or in the name of a nominee or a sub-custodian for, such clearing systems.

## SUMMARY CONSOLIDATED FINANCIAL AND OTHER DATA

You should read the following summary consolidated financial information in conjunction with our consolidated financial statements, together with each of their related notes, "Presentation of Financial and Other Information," "Selected Consolidated Financial and Other Data" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" included elsewhere in this Offering Memorandum. Our consolidated financial statements have been prepared and presented in accordance with TFRS, which differs in certain respects from IFRS. See "Summary of Principal Differences Between TFRS and IFRS."

### Summary Consolidated Financial and Other Data

The following tables set forth our summary consolidated financial information for the years ended December 31, 2018, 2019 and 2020.

#### Summary Consolidated Statement of Income (Loss) Information:

	For the year ended December 31,			
	2018	2019	2020	
	THB	THB	THB	US\$
	(in millions)			
Revenue from sale of goods and rendering of services .....	518,654.7	412,810.3	329,291.2	10,972.7
Cost of sale of goods and rendering of services.....	(466,025.8)	(390,619.3)	(317,093.4)	(10,566.3)
<b>Gross profit .....</b>	<b>52,629.0</b>	<b>22,191.0</b>	<b>12,197.8</b>	<b>406.5</b>
Investment income.....	1,577.3	1,000.8	362.4	12.1
Other income .....	1,117.1	1,317.9	1,920.2	64.0
Gain on bargain purchases.....	1,354.9	31.5	—	—
Selling and distribution expenses .....	(3,405.8)	(3,931.4)	(3,687.1)	(122.9)
Administrative expenses.....	(11,448.5)	(12,537.3)	(11,194.1)	(373.0)
Reversal of (expenses from) raw materials derogation .....	(2,003.6)	232.5	—	—
Reversal of impairment losses on assets .....	—	—	312.7	10.4
Net derivative gain .....	122.0	1,498.8	1,168.9	38.9
Net gain (loss) on foreign exchange rate.....	13.1	1,755.5	(349.5)	(11.6)
Finance costs .....	(3,593.4)	(3,119.4)	(3,511.1)	(117.0)
Share of profit of investments in joint ventures .....	5,208.7	2,625.7	863.2	28.8
Share of profit of investments in associates .....	1,686.1	1,933.1	2,459.4	82.0
<b>Profit before income tax expense ..</b>	<b>43,256.9</b>	<b>12,998.7</b>	<b>542.6</b>	<b>18.1</b>
Income tax benefit (expense).....	(2,986.0)	(649.4)	109.3	3.6
<b>Profit for the year .....</b>	<b>40,271.0</b>	<b>12,349.3</b>	<b>651.9</b>	<b>21.7</b>
<b>Profit attributable to:</b>				
Owners of the Company .....	40,069.5	11,682.1	199.6	6.6
Non-controlling interests .....	201.5	667.2	452.3	15.1
<b>Profit for the year .....</b>	<b>40,271.0</b>	<b>12,349.3</b>	<b>651.9</b>	<b>21.7</b>
<b>Basic earnings per share (Baht) ....</b>	<b>8.89</b>	<b>2.59</b>	<b>0.04</b>	<b>0.00</b>

**Summary Consolidated Statement of Financial Position Information:**

	As of December 31,			
	2018	2019	2020	
	THB	THB	THB	US\$
	(in millions)			
Cash and cash equivalents .....	36,744.0	18,840.3	44,313.0	1,476.6
Total current assets .....	144,310.0	104,494.3	129,911.0	4,328.9
Total non-current assets .....	324,945.3	348,020.1	359,471.7	11,978.4
<b>Total assets .....</b>	<b>469,255.3</b>	<b>452,514.4</b>	<b>489,382.7</b>	<b>16,307.3</b>
Total current liabilities.....	73,858.2	53,033.1	59,041.5	1,967.4
Total non-current liabilities .....	91,914.9	105,885.9	141,347.2	4,710.0
<b>Total liabilities.....</b>	<b>165,773.1</b>	<b>158,919.0</b>	<b>200,388.7</b>	<b>6,677.4</b>
<b>Total equity .....</b>	<b>303,482.2</b>	<b>293,595.4</b>	<b>288,994.0</b>	<b>9,629.9</b>
<b>Total liabilities and equity.....</b>	<b>469,255.3</b>	<b>452,514.4</b>	<b>489,382.7</b>	<b>16,307.3</b>

**Summary Consolidated Statement of Cash Flow Information:**

	For the year ended December 31,			
	2018	2019	2020	
	THB	THB	THB	US\$
	(in millions)			
Net cash from operating activities ...	53,629.0	30,175.0	22,145.8	737.9
Net cash used in investing activities	(32,841.6)	(41,780.0)	(28,274.5)	(942.2)
Net cash from (used in) financing activities .....	(27,397.4)	(6,460.6)	31,793.8	1,059.4
Effect of exchange rate changes on cash and cash equivalents and effect from translation differences on financial statements.....	(75.4)	161.9	(192.4)	(6.4)
Cash and cash equivalents as of the beginning of the year.....	43,429.4	36,744.0	18,840.3	627.8
Cash and cash equivalents as of the end of the year.....	36,744.0	18,840.3	44,313.0	1,476.6

**Certain Other Financial and Operational Information**

	<b>For the year ended December 31,</b>			
	<b>2018</b>	<b>2019</b>	<b>2020</b>	
	<b>THB</b>	<b>THB</b>	<b>THB</b>	<b>US\$</b>
	<b>(in millions, unless otherwise stated)</b>			
<b>ADJUSTED EBITDA Data:</b>				
ADJUSTED EBITDA <sup>(1)</sup> .....	58,263.3	27,801.8	20,290.5	676.1
ADJUSTED EBITDA margin (%) <sup>(2)</sup> .....	11.2	6.7	6.2	—
<b>Certain Other Financial Information and Ratios:</b>				
Total Debt <sup>(3)</sup> .....	96,907.1	107,087.4	155,083.4	5,167.7
Net Debt <sup>(4)</sup> .....	43,345.2	81,527.3	94,425.1	3,146.5
Total Debt to ADJUSTED EBITDA (times) <sup>(5)</sup> .....	1.7	3.9	7.6	—
Net Debt to ADJUSTED EBITDA (times) <sup>(6)</sup> .....	0.7	2.9	4.7	—
ADJUSTED EBITDA to Finance Costs (times) <sup>(7)</sup> .....	16.2	8.9	5.8	—
Net Debt to Equity (times) <sup>(8)</sup> .....	0.1	0.3	0.3	—

**Notes:**

(1) ADJUSTED EBITDA means profit for the year excluding income tax benefit (expense), finance costs, interest income, dividend income, share of profit of investments in joint ventures, share of profit of investments in associates, depreciation and amortization and others.

(2) ADJUSTED EBITDA margin means ADJUSTED EBITDA divided by the sum of revenue from sale of goods and revenue from rendering of services.

(3) Total debt means the sum of short-term loans from financial institutions, long-term loans from financial institutions, long-term loans from others and debentures. For the year December 31, 2020, total debt includes lease liabilities following the adoption of TFRS 16.

(4) Net debt means total debt less (i) cash and cash equivalents and (ii) current investments in financial assets.

(5) Calculated from total debt divided by ADJUSTED EBITDA.

(6) Calculated from net debt divided by ADJUSTED EBITDA.

(7) Calculated from ADJUSTED EBITDA divided by finance costs.

(8) Calculated from net debt divided by total shareholders' equity.

The following table shows a reconciliation of ADJUSTED EBITDA to profit for the year for the periods indicated.

	For the year ended December 31,						
	2018		2019		2020		
	THB	Margin	THB	Margin	THB	US\$	Margin
	(in millions, unless otherwise stated)						
Revenue from sale of goods and rendering of services .....	518,654.7	100.0%	412,810.3	100.0%	329,291.2	10,972.7	100%
<b>Profit for the year .....</b>	<b>40,271.0</b>	<b>7.8%</b>	<b>12,349.3</b>	<b>3.0%</b>	<b>651.9</b>	<b>21.7</b>	<b>0.2%</b>
<b>Adjusted for:</b>							
Income tax expense .....	2,986.0	0.6%	649.4	0.2%	(109.3)	(3.6)	0.0%
Finance costs.....	3,593.4	0.7%	3,119.4	0.8%	3,511.1	117.0	1.1%
Interest income...	(1,176.1)	(0.2%)	(989.4)	(0.2%)	(342.5)	(11.4)	(0.1%)
Dividend income	(37.1)	0.0%	(11.4)	0.0%	(17.4)	(0.6)	0.0%
Share of profit of investments in joint ventures .	(5,208.7)	(1.0%)	(2,625.7)	(0.6%)	(863.2)	(28.8)	(0.3%)
Share of profit of investments in associates .....	(1,686.1)	(0.3%)	(1,933.1)	(0.5%)	(2,459.4)	(82.0)	(0.7%)
Depreciation and amortization ...	19,279.0	3.7%	19,513.9	4.7%	20,377.1	679.0	6.2%
Others <sup>(1)</sup> .....	242.0	0.0%	(2,270.6)	(0.6%)	(457.7)	(15.3)	(0.1%)
<b>ADJUSTED EBITDA.....</b>	<b>58,263.3</b>	<b>11.2%</b>	<b>27,801.8</b>	<b>6.7%</b>	<b>20,290.5</b>	<b>676.1</b>	<b>6.2%</b>

Note:

(1) Others is comprised of gain from private fund, loss from fair value adjustments, gain on bargain purchases, loss on impairment of assets, expenses and reversals of expenses from raw materials derogation, unrealized and realized gain/loss from non-commodity derivatives, and gain/loss from foreign exchange rate.

## RISK FACTORS

*Investing in the Notes issued under the Program involves a high degree of risk. You should carefully consider the risks and uncertainties described below, together with all of the other information set out in this Offering Memorandum, including the consolidated financial statements and the related notes included elsewhere in this Offering Memorandum, before deciding whether to invest in the Notes issued under the Program.*

*The risks and uncertainties described below are not the only ones that may affect us or the Notes issued under the Program. Additional risks and uncertainties that we are unaware of, or that we currently believe are not material, may also become important factors that adversely affect our business. In general, investing in securities of issuers in emerging market countries such as Thailand involves risks not typically associated with investing in the securities of companies in countries with more developed economies. To the extent any information below relates to the Thai government or Thai macroeconomic data, such information has been extracted from official Thai government publications or other third-party sources and has not been independently verified by us.*

### **Risks Relating to Our Business**

***Any significant fluctuation in price of the feedstock we purchase may substantially increase our production costs.***

Cost of our feedstock, primarily comprised of crude oil, condensate and natural gas, forms a substantial majority of our cost of sale of goods, accounting for 25.0%, 16.5% and 11.3% of our total cost of sale of goods, respectively, in the year ended December 31, 2020. As a result, changes in feedstock prices may have a material effect on our results of operations, income and cash flows. The prices of certain feedstock such as crude oil and condensate could be highly volatile. Although we purchase a significant majority of our feedstock pursuant to long-term supply agreements, the purchase prices for a majority of our feedstock are referenced in whole or in part to published industry benchmarks, including Europe, Middle East and Asian crude benchmarks. Because of the commodity nature of the products we sell, price increases in the feedstock that we purchase are not always of the same magnitude or direction as changes in the prices we receive from sales of our products, which can cause significant fluctuations in our margins.

A substantial portion of the crude oil feedstock we purchase from PTT is sourced from the domestic market, the Middle East, Asia, West Africa and the U.S., while the majority of the condensate and natural gas feedstock we purchase from PTT is sourced from the Gulf of Thailand. As a result, our feedstock costs and availability may be adversely affected by conditions in these regions, including political and economic instability, including instability in the Middle East, fluctuations in transportation costs, local rules and regulations, and climate and weather conditions. Other external factors beyond our control can also cause wide fluctuations in feedstock prices. These factors include:

- general economic conditions and policies, including the changes in China's monetary policies;
- level of business activity in the derivative uses for our products;
- actions of our competitors;
- international events and circumstances, including the impact of the COVID-19 pandemic;
- changes in product and process technologies;
- price and availability of substitute products;
- discoveries of low-cost feedstock in new geographical areas;
- tariffs and other governmental regulation, including those relating to the petrochemical and refining industries in Thailand and abroad; and
- natural disasters, including floods, earthquakes, lightning and tsunami.

We also maintain inventories of crude oil and refined petroleum products, as required under Thai laws and regulations, and the value of such inventories are subject to fluctuations in market prices. As a result, changes in the prices of crude oil and other feedstock may have a material adverse effect on our business, cash flow, financial condition, results of operations and prospects.

***Cyclicality in the petrochemical and refining industries may result in reduced volumes or operating margins, and uncertainty regarding the global economic recovery could have a material adverse effect on us in the future.***

Our historical operating results reflect in part the volatile and cyclical nature of the petrochemical and refining industries. Historically, the petrochemical and refining industries have experienced alternating periods of tight supply, resulting in increased prices and profit margins, followed by periods of substantial capacity addition, resulting in oversupply and reduced prices and profit margins. Because of the commodity nature of the products we sell, changes in the prices we receive from sales of our products are not always of the same magnitude or direction as price changes in the feedstock that we purchase, which can cause significant fluctuations in our margins for certain of our products, except profit margins from olefins and polymers, which are more stable as they are based on profit sharing arrangements we have with our feedstock supplier, PTT, which are intended to provide an equitable return on each party's respective investment. Although we sell a majority of our products pursuant to long-term supply agreements with minimum offtake commitments or to customers with whom we have long-standing relationships, our offtake arrangements generally provide for the purchase price to be referenced in part to published industry benchmarks. Any significant downturn in the end markets for our products or in general economic conditions could result in a material reduction in demand and margins for our products and could harm our business. We are unable to predict with certainty supply and demand balances, market conditions and other factors that will affect industry operating margins. We may reduce production at or idle a facility or a particular unit at a facility for an extended period of time, discontinue a product line because of an oversupply of a particular product and/or a lack of demand for that particular product, or high feedstock prices that make production uneconomical.

Other external factors beyond our control can also cause wide fluctuations in the demand for our products, our products prices and margins. For example, factors that may affect our refining margins and financial performance include the ability of the Organization of Petroleum Exporting Countries and other petroleum-producing nations to set and maintain production levels and therefore influence market price; domestic and foreign government regulations with respect to oil and energy industries in general; the level and scope of activity of oil speculators; the price, availability and acceptance of substitute petroleum products, such as biodiesel; adoption of or modifications to environmental, taxation and other laws and regulations in Thailand and abroad; and fluctuations in the value of the Baht against the U.S. dollar. As a result of the foregoing factors, our gross refining margins may decrease, which may adversely affect our business, cash flow, financial condition, results of operations and prospects.

***The outbreak of COVID-19 (or any future pandemic or outbreak of severe communicable diseases) and measures taken in response thereto could adversely affect demand for our products, our business, results of operations and financial condition***

A novel strain of coronavirus (“**COVID-19**”) was first reported in December 2019 and has subsequently spread throughout the world to countries and jurisdictions in which we operate including in Thailand and other countries wherein we have operating plants. On January 30, 2020, the World Health Organization declared COVID-19 a public health emergency of international concern and on March 11, 2020, the World Health Organization declared the outbreak a pandemic. COVID-19 has had and continues to have adverse repercussions across regional and global economies and financial markets which necessarily adversely affects Thailand, the jurisdictions in which we operate and in turn, our business. The governments of many countries, including certain of the jurisdictions in which we operate, have reacted by instituting lockdowns, business shutdowns, quarantines and restrictions on travel. Businesses have also implemented countermeasures and safety measures to reduce the risk of transmission. Such actions have not only disrupted businesses but have had a material and adverse effect on industries and local, regional and global economies.

For example, the Prime Minister of Thailand issued the first order under the Emergency Decree on March 25, 2020. A state of emergency was announced to take effect on March 26, 2020. It has since been extended such that non-resident foreigners were prohibited from entering Thailand, public gatherings were prohibited and public places were closed. Further nation-wide curfews and travel restrictions were imposed on April 3, 2020, while all international passenger flights were suspended on April 4, 2020. Businesses, including ours, have faced disruptions in light of these restrictions that have been put in place and has resulted in reduced levels of commercial activities and industrial production in affected countries. In mid-April 2020, the situation in Thailand improved and the Government gradually implemented a five-phase restrictions easing plan thereafter. However, the nationwide state of emergency was extended and remains in effect as of the date of this Offering Memorandum.

The COVID-19 pandemic may affect our industry and businesses in a number of ways, including:

- resulting in further declines or continuing to repress prices of feedstocks;
- reducing the sales volume of some refined products such as jet fuel due to a decline in demand for air transportation (for which we have adjusted production as necessary to manage our product portfolio and minimize impacts to overall sales volumes);
- limiting our ability to generate cash flow, and as a result, affecting our financial condition;
- adversely impacting our ability to enter into new strategic transactions or to finalize strategic transactions on previously agreed terms and timetables; and
- requiring us to make operational changes and implement measures to ensure the health and safety of our employees and counterparties, which may involve increased costs or operational inefficiencies.

In addition, the COVID-19 pandemic and resulting economic disruption has also led to significant volatility in the capital markets and may adversely impact our ability to access cash. Any or all the aforementioned consequences, individually or in the aggregate, may have an adverse impact on our business and results of operations. Although as of the date of this Offering Memorandum, the COVID-19 pandemic has not had a material adverse impact on our results and liquidity, the extent of the impact of the COVID-19 pandemic on our operational and financial performance will depend on future developments, including the duration and spread of the pandemic and related restrictions and the impact of COVID-19 on the overall economy, all of which are highly uncertain and cannot be predicted. See “*Business—Recent Developments—COVID-19*” for further details on the impact of, and our response to, the COVID-19 pandemic. There can be no assurance that the COVID-19 pandemic or any future outbreak of another virus or other contagious diseases will not have a material adverse effect on our business and results of operations.

To the extent the COVID-19 pandemic adversely affects our business and financial results, it may also have the effect of heightening many of the other risks described in this “*Risk Factors*” section.

***We are heavily dependent on our relationship with PTT as our supplier, customer and major shareholder.***

***— We rely on a limited number of feedstock suppliers, including our principal feedstock supplier, PTT, who is also our major shareholder. If PTT or other suppliers cease to or are unable to supply us with feedstock at prices and terms that are mutually agreeable, we may be unable to procure, or have to incur additional costs to procure, alternative sources of feedstock.***

For the year ended December 31, 2020, we sourced 100.0%, 100.0% and 99.0% of our crude oil, condensate and natural gas feedstock, respectively, under feedstock supply agreements with PTT, our major shareholder. PTT procures crude oil and condensate on the spot market and sources natural gas from the Gulf of Thailand. Our feedstock supply agreements with PTT are generally renewable after the expiration of their initial terms, unless either party indicates an intention not to renew. We believe the pricing we receive under our long-term contracts with PTT are generally better than pricing we would obtain under short-term contracts with other suppliers or in the international spot markets for Southeast Asia. Furthermore, we believe we benefit from a strategically-aligned relationship with PTT, given our position as the PTT Group’s principal petrochemical and chemical arm and as PTT is both our principal offtaker of products and principal supplier of feedstock. Notwithstanding this, our pricing and profit sharing arrangements with PTT are subject to arm’s length negotiations and our feedstock costs may increase from time to time. Furthermore, there is no assurance that PTT will be able to procure natural gas and other feedstock from the Gulf of Thailand or elsewhere at similar quantities, or at all.

We also procure feedstock from short-term suppliers and on the spot market. Our reliance on these short-term suppliers and spot market purchases increases during periods when PTT or other long-term suppliers experience plant shutdowns or other interruptions in their ability to supply feedstock. Our reliance on our short-term suppliers and spot market purchases also increases during periods when our demand for feedstock exceeds historical norms. If any of these short-term suppliers should for any reason decline to continue to supply us with feedstock on mutually agreeable terms and prices after the expiry of their current or future short-term contracts, we may be required to import our feedstock or increase our spot market purchases, either of which may be more costly. Similarly, if PTT or other long-term suppliers fail to supply us with feedstock pursuant to the terms of the



relevant agreements or we fail to negotiate an extension or renewal of such contracts at all or on reasonable terms, we may be unable to procure, or have to procure at higher cost, alternative sources of feedstock.

***— We sell a significant portion of our products to PTT Group and may be materially and adversely affected by a reduction in or loss of sales to PTT Group.***

PTT Group is our largest customer by revenue, accounting for 36.6% of total sales revenue in the year ended December 31, 2020. From our sales to PTT Group (as distributor to end-users), 85.6% and 14.2% were refinery and aromatics products, respectively, in the year ended December 31, 2020. As a result, we will be affected by a reduction in or loss of sales to PTT Group or changes in its financial condition or operations.

We cannot assure you that PTT Group will be able to continue to purchase our products in quantities historically purchased, or at all. If PTT Group is unable to purchase our products, or otherwise ceases or suspends its purchases, and we cannot find other customers to offtake those quantities in bulk, we will likely respond by increasing our sales efforts to new customers or directly to end users in the Thai domestic market or in the international spot markets for Southeast Asia and East Asia. Negotiated pricing under direct sales in the Thai domestic market and pricing in the international spot markets for Southeast Asia and East Asia are less predictable and more prone to volatility. As a result, our revenues, margins and cash flows may be adversely affected.

We generally make sales to PTT Group under long-term offtake agreements with minimum offtake commitments. As a result, our inability to successfully negotiate offtake agreements with PTT Group, or the failure of PTT Group to comply with the terms of the existing offtake agreements, could have a material adverse effect on our business, financial condition, results of operations and prospects. PTT Group sells certain of the products it purchases from us to other end-user customers. Any changes in the demand for our products from end-user customers may affect future levels of offtake commitments by PTT Group and adversely impact our business and results of operations.

***— We are heavily dependent on our relationship with PTT, our major shareholder, and the interests of PTT or its associated companies, or of our directors or executive officers, may conflict with ours and yours as a holder of the Notes.***

As of May 5, 2020, PTT (which is majority-owned by the Government) owned 47.7% of our total ordinary shares outstanding. PTT has the ability to influence the outcome of actions requiring shareholder approval, including the nomination and approval of the directors, and their interests may not be aligned with yours as a holder of the Notes. Many of our directors, including the Chairman of our Board of Directors, are currently, or previously have been, directors or executive officers of PTT or a PTT Group company. As a result, circumstances may occur in which the interests of PTT or its associated companies may be in conflict with our interests, and our management may face potential conflicts of interest in fulfilling their responsibilities as directors and executive officers.

PTT and a number of other companies affiliated with PTT compete with us for sales of various products and for sales in the Thai domestic market and in the international markets. Generally, conflicts of interest may arise between us and the PTT Group each time we make business and other decisions that may have different implications for us and our principal shareholders and their associated companies. Potential conflicts of interest include matters relating to:

- entering into, negotiating terms for, or agreeing to amendments to or waivers of any breach (e.g., in reliance on hardship or force majeure clauses) of any feedstock supply or offtake agreements, including terms relating to pricing and minimum offtake quantities with respect to any agreements entered into with PTT or its associated companies;
- potential competition or new ventures in the petrochemical and refinery businesses;
- issuances or dispositions of securities;
- investment decisions and other capital expenditures;
- enforcement of contract rights;
- payment of dividends and other distributions; and
- regulatory and legal positions;

There can be no assurance that we or PTT will be able to resolve any potential conflict, or that, if such conflicts are resolved, we would not receive a more favorable resolution if it were dealing with an unaffiliated party. We have adopted a Code of Conduct for our directors and executive officers that includes provisions designed to address such conflicts of interest. However, we cannot assure you that conflicts of interest among ourselves and our directors and executive officers, on the one hand, and the PTT Group and its directors and executive officers, on the other hand, will always be resolved in a manner not adverse to our interests or your interests as holders of the Notes.

***— If PTT, as our supplier, customer and major shareholder, reduces or withdraws its stake in us, we may cease to derive benefits from our relationship with PTT.***

Our major shareholder, PTT is the largest supplier of petroleum and natural gas in Thailand by market share and revenue. We benefit from our relationship with PTT in a number of important respects. As the principal petrochemical and chemical company of the PTT Group, we are able to benefit from PTT's market position, expertise and customer base. PTT's position as our principal feedstock supplier and principal offtake customer provides important stability to our business. Our membership within the PTT Group also provides us with significant economies of scale, discounts through bulk purchases, business opportunities and group synergies.

Other benefits of being majority-owned by PTT include access to advanced technological, operational and engineering services, and participation in PTT's research and development programs. We also benefit from the use of the "PTT" logo, the availability of PTT and affiliated management and technical personnel, including certain of our senior personnel. Certain of our agreements contain termination or amendment clauses in the event PTT reduces its shareholding in our Company. For example, our revised gas feedstock supply agreement with PTT provides for a mandatory revision to the specified pricing formula in the event that PTT is no longer our major shareholder. In addition, our concession agreement for the operation of our refinery with the Ministry of Energy (formerly, the Ministry of Industry) may be terminated upon a one-month notice from the Ministry of Energy if PTT ceases to hold at least 25% of our registered share capital. Finally, under a number of our outstanding loan agreements, an event of default is deemed to occur if PTT, directly and indirectly, owns less than 40% of our issued share capital. We cannot assure you that PTT will continue its current level of shareholding in us, or at all, or that PTT will continue to provide support to us. If PTT reduces its shareholding in us or ceases to provide us with support, or if any of our material feedstock and offtake agreements with PTT were terminated, and we were unable to secure alternate sources for such financing and services or recruit additional key personnel, our business, cash flow, financial condition, results of operations and prospects could be materially adversely affected.

***Our business is capital intensive and our expansion plans have significant capital expenditure and financing requirements, which are subject to a number of risks and uncertainties.***

The petrochemical and refining industries are capital intensive. Our ability to maintain and increase our revenues and net profits depends on continued capital spending, including investing in, constructing, upgrading and maintaining our facilities. In addition, we continually monitor developments in the petrochemical and refining products markets in Thailand, Southeast Asia, East Asia and elsewhere for opportunities to expand into new businesses or invest in derivative uses of our petrochemical and refinery production. Any future expansion of our business, including our planned expansion projects, will require additional capital expenditures, which may be substantial.

Our actual capital expenditures depend on various factors, including, among others, unplanned cost overruns, our ability to generate sufficient cash flows from operations and our ability to obtain adequate external financing for our planned capital expenditures. In addition, we cannot assure you whether, or at what cost, our planned or other possible expansion projects will be completed or that these projects will be successful if completed. See "*Risk Factors—Risks Relating to Our Business—Our planned expansion projects may not be completed as planned or at all. In addition, the cost of our planned expansion projects may be more than we anticipate.*"

Our future plans contemplate significant investments into new product opportunities, including performance materials and chemicals, such as polyurethane, other downstream and derivative petrochemical products, green chemicals and other high value businesses ("**HVB**"). For instance, PTTGC America LLC is conducting a feasibility study in relation to a production facility in Ohio, U.S. We believe that we must continue to dedicate a significant amount of resources to maintain our competitive position and diversify into new product offerings. However, we may make these investments without being certain that they will result in products that the markets will accept or that they will expand our share of those markets. We may also experience delays in

developing and releasing new products. This has led to, and may in the future lead to, increased expenses and lower than anticipated sales revenue. In addition, our future growth is also dependent on our ability to capture more downstream value in our production chain, particularly in performance materials and chemicals, green chemical products and other downstream and derivative petrochemical products. If we are unable to succeed in capturing more downstream value, or if we are unable to acquire the adequate technology or find adequate joint venture partners from which to acquire new technology, our results of operations may be adversely affected. Any or all of the above problems could materially harm our business and operating results.

***Our operations consume large amounts of electricity, industrial water, steam and other utilities, and shortages, supply disruptions or substantial increases in the price of such utilities could adversely affect our business.***

The successful operation of our plants depends on an uninterrupted supply of electricity, industrial water, steam and other utilities. Accordingly, we are at risk in the event of a disruption in the supply of any of these utilities. Prolonged blackouts or disruptions caused by natural disasters such as floods, droughts, earthquakes or tsunami could also substantially disrupt our production, directly or indirectly. Future disruptions could materially and adversely affect our operating results and financial condition. Many factors, such as the supply and demand for electricity, general economic conditions, changes in Government policies, political instability and global weather patterns, including natural disasters such as floods, droughts, earthquakes or tsunami may affect the availability and prices of these utilities. These risks may be exacerbated given the close proximity of our plants. Additional prolonged substantial increases in the price of these utilities could have a material and adverse effect on the costs of operating our plants and would negatively impact our gross margins unless we are able to fully pass on the additional expense to our consumers.

***We sell a significant portion of our petrochemical and refinery production in the highly competitive Thai domestic and international spot markets and may face competitors with greater resources in these markets.***

We sell a significant portion of our petrochemical and refining products as transactional sales in the highly competitive Thai domestic market and as exports in the highly competitive international spot markets for Southeast Asia and East Asia. For example, for the year ended December 31, 2020, 31.2% and 77.8% of total sales revenue of our refinery and aromatics products, respectively, were generated outside of our offtake agreements with the PTT Group. Because of the commodity nature of our petrochemical and refining products, competition in the Thai domestic and international spot markets for these products is based primarily on price and, to a lesser extent, on product quality and lead times to product delivery. As a result, we generally are not able to protect our position in the Thai domestic market and export markets by product differentiation and may not be able to pass on price increases to our customers.

Some of our competitors who sell into the markets to which we export may be able to drive down product prices if they have costs lower than ours and their export quantities are sufficiently large to influence market prices. Furthermore, some of our competitors may have greater financial, technological and other resources than ours, and may be in a better position to withstand changes in market conditions. Our competitors may also be able to respond more quickly to new or emerging technologies and changes in customer requirements than we can.

We face competition for the acquisition, development and production of petrochemical and refining products in Thailand and abroad, and for the capital to finance such activities, including companies that may have greater financial and other resources. Our ability to enter into commercial arrangements with customers will be dependent upon the continuation of our close working relationships with them, our joint venture partners, the status of PTT as the primary purchaser of our products in Thailand, and our ability to select and evaluate suitable expansion projects and consummate transactions in a highly competitive environment. See “*Business—Competition.*”

***Our plants are subject to operating and other risks that may adversely affect our operations.***

Our operations are subject to operating and other risks typically associated with petrochemical and refinery manufacturing and the related storage and transportation of highly flammable, explosive and hazardous raw materials, products and wastes, the occurrence of which could affect our productivity, results of operations and operations as a whole, including, among other risks:

- fires and explosions;
- mechanical failures, malfunctions and interruptions;
- pipeline leaks and ruptures;

- remediation complications;
- discharges or releases of hazardous substances or gases and other environmental risks;
- storage tank leaks;
- chemical spills; and
- inclement weather and natural disasters.

Our income and cash flows will be adversely affected by any disruption of operations of our existing production plants due to any of the foregoing risks. For example, any unplanned plant shutdowns for an extended period of time will have a materially adverse effect on our ability to produce products for sale, and therefore, our results of operations could suffer. In addition, many of these operating and other risks may cause personal injury and loss of life, severe damage to or destruction of property and equipment and environmental damage, and may result in loss of permits or licenses, suspension of operations and the imposition of civil or criminal penalties.

Substantially all of our revenues are derived from sales of our products produced at our production plants in the Map Ta Phut Industrial Complex in Thailand. Our principal feedstock suppliers and principal customers are also located in or near the Map Ta Phut Industrial Complex. Significant damage to our or their plants, offices, facilities or the pipeline network in the Map Ta Phut Industrial Complex, whether as a result of accident, fire, flooding, terrorist attacks or other causes, could interrupt our operations and have a material adverse effect on our results of operations.

Furthermore, a portion of our crude oil pipelines that we and Star Petroleum Refining Public Company Limited (“SPRC”) jointly own lies under land that has been reclaimed by the Industrial Estate Authority of Thailand (“IEAT”) for industrial use. IEAT has granted use of the reclaimed land to an unaffiliated power company to construct a power generation plant, resulting in part of our pipelines being buried and inaccessible by us. While we and SPRC have inspected the crude oil pipeline and the pipeline is in good condition and up to standards for operation, if we are not granted access in the future, any such limitation could prevent us from taking remedial actions should leaks occur or to complete our routine inspection and maintenance work.

We cannot assure you that there will be no interruptions of operations, lost revenues, increased maintenance costs and damages in the future as a result of the risks outlined above or other risks, and the occurrence of any of these events may have a material adverse effect on our business, financial condition and results of operations.

***Our insurance coverage may not adequately protect us against operational hazards, natural disasters and other unforeseen circumstances and their resulting losses.***

Our operations may be adversely affected by various factors, including operational hazards (*see — “Our plants are subject to operating and other risks that may adversely affect our operations”*), natural disasters and other unforeseen circumstances such as interruption of power supply. We carry all-risks insurance, business interruption insurance and third-party liability insurance for all our commercial operating plants. As of December 31, 2020, the total amount of such all-risks insurance, business interruption insurance and third-party liability insurance coverage was US\$14,430 million. In addition, we carry insurance coverage for our projects under construction. We also carry policies for loss of gross profits as a consequence of fire, explosion, electrical damage, machinery breakdown, natural catastrophes, and fuel and/or power shortages, including third party liability insurance, transport insurance, computer insurance and life insurance for all of our employees. We believe our policies are in accordance with customary industry practices, including deductibles and coverage amounts. However, the losses incurred or payments required may exceed our insurance coverage, and our results of operations may be adversely affected as a result. In addition, our insurance policies do not cover any penalties or fines or other payments made to the Government resulting from any of these risks. Although we believe that Thailand does not have a history of levying material fines in the petrochemical and refining industries, we cannot assure you that the Government will not do so in the future.

***Failure to obtain, renew or maintain the permits and approvals required to operate our businesses may have an adverse effect on our business, financial condition, results of operations and prospects.***

We require permits and approvals to operate our business and/or to construct and operate our plants. For example, we are required to obtain environmental impact assessment approvals, and to comply with license requirements, rules, laws and regulations with respect to construction permit, fire prevention, safety and

environmental protection. Health and environmental impact assessment approvals, if required, for any new projects are time-consuming, create uncertainty and may impact the feasibility of our planned projects. In the future, we may be required to renew such permits and approvals or to obtain new permits and approvals. There can be no assurance that the relevant authorities will issue any such permits or approvals in the time frame anticipated by us, or at all.

In response to recent Government-enacted control parameters on the release of polluted air emissions from refineries and gas separation plants, we have adopted environmental compliance procedures, including environmental assessment, safety, health and environment regulations management, and waste management procedures. We continue to monitor changes in safety, health and environment rules and regulation and engage in mitigation projects to anticipate any emerging issues, including VOC emission and soil and groundwater quality, which may require us to obtain new permits or approvals in the future. See “*Business—Environment.*”

We cannot assure you that we will be able to obtain these and other approvals and permits that are critical to our business in a timely manner or at all. Failure to obtain such approvals and permits may subject us to fines, suspensions, or disrupt our operations and construction, which may materially and adversely affect our business, results of operations and financial condition.

***The costs to comply with, and to address liabilities arising under, environmental laws and regulations could adversely affect our business, financial condition, results of operations and cash flows.***

We are subject to a wide range of environmental laws and regulations in Thailand and other countries in which we operate concerning, among others, the preparation of health and environmental impact assessments for our projects, the protection of the environment and human health, the generation, storage, handling and disposal of waste, the discharge of pollutants and the remediation of contamination. As a refinery and petrochemical products manufacturer, we generate air and water emissions. At times, despite our precautions, we may also generate hazardous wastes. These emissions and waste disposals are subject to limits or controls prescribed by law or by our operating permits, and we may be required to install or upgrade our pollution control equipment in order to meet these legal requirements. We have made, and expect to continue to make, expenditures to maintain compliance with environmental laws and industry standards. Failure to comply with environmental requirements may result in civil, administrative or criminal fines or sanctions, claims for environmental damages, remediation obligations, the revocation of environmental authorizations or the temporary or permanent closure of plants. Environmental regulations in Thailand and other countries in which we operate have become increasingly stringent in recent years (for example, in connection with the approval and development of new projects), and this trend is likely to continue. Future changes in environmental laws, or in the application, interpretation or enforcement of those laws, including new or stricter requirements related to harvesting activities, air and water emissions and/or climate change regulations, could result in substantially increased capital, operating or compliance costs, impose conditions that restrict or limit our operations or otherwise adversely affect our business, financial condition, results of operations and cash flows. These changes could also limit the availability of our funds for other purposes, which could adversely affect our business, financial condition, results of operations and cash flows. Litigation and protests related to the environment and continued focus on these issues pose reputational and other risks that could materially and adversely affect our results of operations and business. Protests relating to environmental and other issues have also occurred.

Additional proceedings, enforcement actions or claims related to compliance with environmental requirements or alleged environmental damages and protests related to environmental and other issues may impact us directly or adversely affect our customers. Any such proceedings, claims or protests may have an adverse effect on our reputation, business, financial condition, results of operations and cash flows. See “*Business—Environment.*”

***Compliance with health and safety regulations can be costly, while non-compliance with such regulations may result in adverse publicity and potentially significant monetary damages, fines and suspension of our business operations.***

Our business involves the handling, manufacture and use of substances and compounds that may be considered toxic or hazardous within the meaning of environmental, health and safety laws. As a result, we may face liability for alleged personal injury, property damage or product defects due to exposure to chemicals or other hazardous substances at our plants or chemicals that we manufacture, handle, own or sell. Although we have not experienced any claims of this nature to date, claims of this nature can be substantial and could in the future materially adversely affect our reputation, business, financial condition, profitability or cash flows.

We also incur and expect to continue to incur capital and operating costs to comply with health and safety laws and regulations in Thailand and other countries in which we operate. In addition, new laws and regulations, stricter enforcement of, or changes to, existing laws and regulations, the discovery of previously unknown health and safety hazards or the implementation of more stringent quality standards could in the future require us to incur costs, or affect our production or revenues, in ways that may have an adverse effect on our financial condition or results of operations. We cannot assure you that material capital expenditures, costs, or operating expenses beyond those currently anticipated will not be required under applicable health and safety laws and regulations, or that developments with respect to such laws and regulations will not adversely affect our production or revenues. See “*Business—Health and Safety.*”

***We may be subject to legal proceedings that could be time consuming, result in costly litigation, require significant amounts of management time and result in the diversion of significant operational resources.***

We may be involved in lawsuits, claims and proceedings, whether incident to the ordinary course of our business or otherwise. Litigation is inherently unpredictable. Any claims against us, whether meritorious or not, could be time consuming, result in costly litigation, require significant amounts of management time and result in the diversion of significant operational resources. The cost of defending claims against us or the ultimate resolution of such claims may harm our business, reputation and operating results. See “*Business—Legal Proceedings.*”

***Compliance with governmental regulations and changes in laws and regulations and risks from investigations and legal proceedings could be costly and could adversely affect operating results.***

Our operations could be impacted by changes in the legal and business environments in which we operate as well as the outcome of government investigations, tax audits and legal proceedings. Also, as a result of new laws and regulations or other factors, we could be required to curtail or cease certain operations. Changes that could impact the legal environment include new legislation, new regulation, new policies, investigations and legal proceedings and new interpretations of the existing legal rules and regulations. Changes that impact the business environment include changes in electricity supply and tariffs, including the tariffs applicable to end-user customers, product specification and pricing intervention, changes in accounting standards, changes in environmental laws, changes in tax laws or tax rates, including tax rules and regulations affecting transfer pricing of products between group companies, and changes affecting the rights, privileges and conditions under our Board of Investment of Thailand (“**BOI**”) investment promotion certificates. See “*Business—Investment Promotion,*” “*Business—Environment,*” and “*Business—Legal Proceedings.*” These changes could have a significant financial impact on our future operations and the way we conduct, or if we conduct, business in the affected countries.

The Government may intervene from time to time to regulate the prices we charge for our products. For example, the Government regulates the ex-refinery retail and wholesale prices of LPG, which is largely used by households for cooking gas. The Government requires all LPG producers, including us, to sell LPG to offtakers at fixed prices. Sales in excess of the Government mandated price must contribute to the Government oil fuel fund. Any changes in the Government’s pricing policies may result in a material adverse impact on our business, operating results, and financial condition.

***Our planned expansion projects may not be completed as planned or at all. In addition, the cost of our planned expansion projects may be more than we anticipate.***

We are engaged in a number of expansion projects, including the Olefins Reconfiguration Project (“**ORP Project**”) and Olefins 2 Modification Project (“**OMP Project**”). The ORP Project is expected to commence commercial operations in the first quarter of 2021. Upon commencement of operations, we expect to be able to use Light Naphtha (LN) and/or Liquefied Petroleum Gas (LPG) from existing facilities and/or imported as feedstocks to produce 500,000 metric tons of polymer-grade ethylene per year and 250,000 metric tons of polymer-grade propylene per year, thereby enhancing our feedstock flexibility. We have also announced the our final investment decision in the OMP Project, which is planned to commence commercial operations within the first quarter of 2023. This project will allow us to increase the use of propane as feedstock, aligned with our strategy to enhance feedstock flexibility and long-term competitiveness.

We expect to continue to invest in these types of expansion projects. The timing and cost of completion of these projects will depend on a number of factors, including the cost and availability of financing and changes in general economic conditions in Thailand and elsewhere or our intended significant export markets. The completion of these projects may also be adversely affected by uncertainties commonly associated with large construction and expansion projects. These include shortages or changes in prices of equipment or materials,

defects in design or construction, lack of environmental approvals, adverse weather conditions, natural disasters, accidents and unforeseen circumstances and problems, variations to the scope of work or specifications that we may require or other variations that may be claimed by the contractor. Any of these uncertainties may cause delays in completion of all or part of the planned projects and increases in related investment costs. We cannot assure you that we will be able to obtain the full amount of financing for these projects, or that any financing obtained will be timely or on terms favorable to us.

***Our operations are subject to the risks associated with acquisitions and investments in joint ventures, corporate restructuring and sales of assets.***

As part of our business strategy, we build and enhance our existing market leadership position in each of the regions where our Group operates, as well as grow and expand our businesses and geographical presence through selected greenfield and brownfield acquisitions, investments and joint ventures. Therefore, we continually review opportunities for strategic growth through value-enhancing acquisitions and joint ventures. Our ability to acquire new businesses or enter into joint ventures from time to time may be limited by many factors, including (without limitation) availability of financing, government regulation and competition from other potential acquirers. Even if we are successful in acquiring new businesses, the integration of these businesses may present significant costs and challenges. Additionally, these transactions present financial, managerial and operational challenges, including (without limitation):

- diversion of management attention from other business concerns;
- difficulty in locating a suitable target or joint venture partner;
- difficulty in funding our investments;
- difficulty with integrating businesses, operations, personnel and financial and other systems;
- lack of experience in operating in the geographical market of the acquired business or joint venture;
- potential loss of key employees, suppliers and customers of the acquired business or joint venture;
- assumption of and exposure to unknown or contingent liabilities of the acquired business or joint venture; and
- potential lack of common business goals and strategies with, and cooperation of, our joint venture partners.

In the case of projects we are undertaking together with joint venture partners, we, or our joint venture partners, may decide not to proceed with the construction of the proposed plants for various reasons, including the inability to obtain sufficient financing, increased costs and other regulatory, operating or commercial risks, some of which are beyond our control. If we or our joint venture partners decide not to proceed with any of the proposed projects, or are unable to proceed, our reputation and results of operations may be adversely affected. Acquisitions and investments in joint ventures outside Thailand may present unique difficulties and increase our exposure to those risks associated with international operations. The existence or occurrence of one or more of the circumstances and events described in the preceding paragraph could have a material adverse impact on our profitability or the viability of our acquired businesses and the interests held through our joint ventures, which could have a material adverse impact on our reputation, cash flows, earnings, results of operations and financial condition.

Furthermore, we must comply with applicable antitrust laws and may have to seek prior approval from the relevant governmental authorities if we are to acquire or merge with other businesses in Thailand or elsewhere. Failure to comply with the applicable restrictions or obtain the approval could delay or obstruct our operation expansion plans and, in turn, have a material adverse effect on our business, financial condition, results of operations and prospects.

While we continue to evaluate growth and expansion through potential acquisitions, investments and joint ventures, we also continue to evaluate our current investments and portfolio of assets with a view to potential restructurings and/or sales of certain of our non-core assets from time to time. Risks commonly encountered in connection with such restructuring and sales may include incorrect valuation of assets, diversion of management's attention, significant costs and expenses, the loss of customer relationships and cash flows, and the disruption of the affected assets or business operations. Failure to timely complete or to consummate such transactions may

also negatively affect the valuation of the affected assets or business operations.

***We may not be able to sell the additional production or new products that we produce following our expansion projects and/or enter into new business areas on commercially acceptable terms.***

We intend to sell our additional production and/or new products that we produce both to existing and new customers. We cannot assure you that sufficient demand for our additional production and/or new products will exist in either the domestic or export markets, or if sufficient demand does exist, that we will be able to sell our products at prices that will provide us with commercially acceptable margins or that will not cause us to incur losses. Our sales may also be adversely impacted if we fail to accurately estimate demand for our products or experience technical problems with our expansion projects or new business lines. If we are unable to sell our additional production and/or new products on commercially acceptable terms, we may have to decrease the utilization of our plant, which would have an adverse effect on our business, financial condition, results of operations and prospects.

Our current business plan contemplates that we will become involved in markets that are new to us. We expect that we will have to compete in domestic and overseas markets that we have previously not sold into. We cannot assure you that we will be successful or that the terms of these sales will be favorable to us.

***Future financing may place restrictions on our operations.***

We expect to finance any future expansions of our business or the upgrade and maintenance of our plants through additional indebtedness, whether project-specific or otherwise, and/or cash flows from operations. We cannot assure you that we will be able to obtain additional financing when needed on commercially acceptable terms or at all. Any additional debt financing may place restrictions on us, which may, among other things:

- increase our vulnerability to general adverse economic and industry conditions;
- limit our ability to pursue growth plans;
- limit our ability to raise additional debt financing;
- require us to dedicate a substantial portion of cash flow from operations to payments on our debt, thereby reducing the availability of our cash flow to fund capital expenditure, working capital requirements and other general corporate purposes; and/or
- limit our flexibility in planning for, or reacting to, changes in our business and its industry, either through the imposition of restrictive financial or operational covenants or otherwise.

For a summary of certain terms of our existing material indebtedness, see “*Description of Other Material Indebtedness.*”

In the past, economic developments outside Thailand have adversely affected the markets in which we operate and our overall business. For instance, recent concerns relating to the U.S. Federal Reserve’s decision to cut interest rates in the United States have led to increased volatility, particularly in the stock and currency markets in emerging economies. In addition, following a national referendum and enactment of legislation by the government of the United Kingdom, the United Kingdom formally withdrew from the European Union and ratified a trade and cooperation agreement governing its future relationship with the European Union. The agreement, which is being applied provisionally from January 1, 2021 until it is ratified by the European Parliament and the Council of the European Union, addresses trade, economic arrangements, law enforcement, judicial cooperation and a governance framework including procedures for dispute resolution, among other things. Because the agreement merely sets forth a framework in many respects and will require complex additional bilateral negotiations between the United Kingdom and the European Union as both parties continue to work on the rules for implementation, significant political and economic uncertainty remains about how the precise terms of the relationship between the parties will differ from the terms before withdrawal. The United States and China have also been involved in controversy over trade barriers in China that threatened a trade war between the countries and have implemented or proposed to implement tariffs on certain imported products. Sustained tension between the United States and China over trade policies could significantly undermine the stability of the global economy.

If there is a tightening of credit in financial markets globally, this could also impact the Thai market and debt could become significantly more expensive for us. We may not be able to arrange for debt financing for our



capital requirements at all or debt financing which is available to us may not be on commercially acceptable terms; as a result, we may experience material cash flow problems. Any difficulties we face in accessing financing on acceptable terms and conditions could have a material adverse effect on our business, financial condition, results of operations and prospects.

***Our business operations and future operating results may be adversely affected by events outside of our control, including, but not limited to, natural disasters such as the recent flooding in central Thailand and tsunami in southern Thailand.***

Our business and operating results are vulnerable to interruption by events outside of our control that may affect our plants or facilities in Thailand or the facilities of our suppliers and customers. Possible disruptions include, among others: earthquakes, fire, tsunami, volcanic activity, flooding, power loss, telecommunications failures, political instability, military conflict and uncertainties arising from terrorist attacks, the economic consequences of military action or terrorist activities and associated political instability, and the effect of heightened security concerns on domestic and international travel and commerce. Floods and other natural events beyond our control can harm our business, financial condition and results of operation by causing, among other things, production stoppages, the incurrence of significant costs, including, but not limited to, supply chain shortages or reduced demand for our products due to the impact on our customers or supply chains.

***Failure to adequately protect our intellectual property could have an adverse and material effect on our results of operations or financial condition.***

Intellectual property rights are an important part of our polymer, green chemical and performance materials and chemicals business units. We attempt to protect our intellectual property rights and acquire rights to use third parties' intellectual property through a combination of patent, trademark and copyright laws, as well as licensing agreements and third-party nondisclosure and assignment agreements. See "*Business—Research and Development and Intellectual Property.*" Adverse determinations in a judicial or administrative proceeding could prevent us from producing and selling our products or prevent us from stopping others from producing and selling competing products. Failure to obtain or maintain adequate protection of our intellectual property rights and licenses of third parties' intellectual property rights for any reason could have a material adverse effect on our business.

***We depend on the expertise of our senior management and skilled personnel.***

We are dependent on our senior management for setting our strategic direction and managing our business, which are crucial to our success. Furthermore, our continued success also depends upon our ability to attract and retain a large group of experienced professionals, including skilled engineers, technicians, and sales and marketing personnel in our existing and future planned product lines. We have been successful in the past in attracting qualified managers and key personnel, and we have invested significant resources in training our personnel. However, shortages of trained engineers, technicians and managers in Thailand and other countries where we operate may make it more difficult or costly for us to hire adequate numbers of such personnel in the future.

***Increased IT security threats, breaches, hacking and similar disruptive problems could adversely affect our IT systems, network and production.***

Increased global IT security threats, breaches, hacking and similar disruptive problems present risks to the confidentiality, security and integrity of our data, system, network and operations. Furthermore, our operating activities could be subject to risks caused by the misappropriation, misuse, leakage, falsification or accidental release or loss of information maintained in our IT systems and network. While we maintain systems and security procedures to oversee compliance with applicable cybersecurity and data protection laws and regulations, any failure of such systems and security procedures could result in damage to our reputation and the credibility of our operations and adversely affect our business and operations.

#### **Risks Relating to the Treasury Center as an Issuer**

***The Treasury Center has limited assets and is dependent on intercompany loans from the Company and its subsidiaries.***

The Treasury Center is a subsidiary of the Company and is its designated corporate treasury center. As an Issuer, it will on-lend the proceeds from the sale of the Notes to the Company or its subsidiaries. The Treasury Center will depend on payments from these inter-company loans and other similar loans to provide it with funds

to meet its obligations under the Notes, including payments of principal and interest thereon. The Treasury Center has limited assets and no subsidiaries. See “*Description of the Treasury Center.*” The Treasury Center’s material liabilities will be the Notes and other securities. As such, it will be dependent upon payments under intercompany loans to make any payments due on the Notes. Should any of the companies to which the Treasury Center lends be unable to fund their payments under their respective loans, then the Treasury Center may be unable to meet its obligations under the Notes.

### **Risks Relating to Thailand**

***Most of our assets and operations are located in Thailand and we are subject to economic, legal and regulatory uncertainties in Thailand.***

Most of our assets and operations, including our headquarters, are located in Thailand. Consequently, we are subject to political, legal and regulatory conditions in Thailand that differ in certain significant respects from those prevailing in other countries. There is no assurance that the Thai economy will meet current projections or improve in the future. Any downturn in the Thai economy could have a material adverse effect on our business, financial condition, results of operations and prospects and the market price of the Notes. Furthermore, prior Thai governments have, in the past, intervened in the Thai economy and occasionally made significant changes in policy including, among other things, foreign exchange control, policies concerning wage and price controls (including price controls on LPG), capital controls and limits on imports, at times partially reversing such policies soon after the new policies were announced. See “—*Risks Relating to Our Business—Compliance with governmental regulations and changes in laws and regulations and risks from investigations and legal proceedings could be costly and could adversely affect operating results.*”

Our businesses and operations in Thailand are subject to the changing economic conditions prevailing from time to time in Thailand. From 1996 to 1998, Thailand’s gross domestic product (“GDP”) growth slowed significantly in relation to historical levels and the country entered a recession. Since 1999, Thailand’s economy has been recovering, recording positive GDP growth each year until the global economy began to worsen in 2008. According to the National Economic and Social Development Council of Thailand, Thailand’s GDP grew by 4.2% in 2018, 2.3% in 2019. In 2020, the COVID-19 pandemic resulted in lockdowns worldwide and paused economic activity. As a result, the economy entered into a recession and Thailand’s GDP experienced negative growth at -6.1% in 2020. However, the continued prospects for the global and regional economy are uncertain. The demand for energy is generally correlated with GDP, and a contraction in Thailand’s GDP could lead to a reduction in the demand for energy, which could have a material adverse effect on our business, financial condition, results of operations and prospects. There is no assurance that the Thai economy will meet current projections or improve in the future. Any instability or economic downturn in Thailand could have a material adverse effect on our business, financial condition, results of operations and prospects and the market price of the Notes.

From 1996 to 1998, international credit rating agencies, including Moody’s, Fitch and Standard & Poor’s, lowered Thailand’s sovereign rating as well as various Thai corporate debt ratings. With the improved performance of the Thai economy in 1999 through 2003, there was corresponding improvement in these credit ratings. As of December 31, 2020, Thailand’s sovereign foreign currency long-term debt was rated “Baa1” with a stable outlook by Moody’s, “BBB+” with a stable outlook by Fitch and “BBB+” with a stable outlook by Standard & Poor’s. In the past, certain credit rating agencies have warned that Thailand’s credit rating may be downgraded due to political uncertainties and the weakening of the fiscal economic condition. Future lowering of the credit ratings for Thai sovereign debt may make it more expensive for us to obtain additional debt financing for our working capital and capital expenditures, which could have an adverse effect on our financial condition.

Additionally, prior Thai governments have, in the past, intervened in the Thai economy and occasionally made significant changes in policy. Policy changes made by the Thai government and the Bank of Thailand have included the imposition (and subsequent reversal) of a one-year 30% unremunerated reserve requirement on foreign exchange inflows, under which any foreigner buying stock in Thailand had to place an extra non-interest-bearing deposit. There is no assurance that the Thai government will not in the future reimpose restrictive foreign exchange controls that may affect the outward remittance of funds, including interest or other payments payable on the Notes. Our business, financial condition, results of operations and prospects and the market price of the Notes may be adversely affected by future changes in Thai government policies.

***Political conditions in Thailand will have a direct impact on our business and the market price of the Notes.***

Our business, financial condition, results of operations and prospects may be influenced in part by political conditions in Thailand, which have historically been subject to periods of instability, including military

coups and political demonstrations and violence. If any military strikes, violent acts or other political events were to occur in Thailand, it could have a material adverse effect on our business. Following the military coup in May 2014, the Thai military government introduced a number of political reforms, but there can be no assurance that these reforms will promote growth and stability within Thailand. Further, no assurance can be provided that these reforms will not lead to further political instability or slower economic growth.

Thailand held its general elections for the members of the House of Representatives on March 24, 2019. The official results of the election of the members of the House of Representatives were announced on May 28, 2019. The appointment of the prime minister was announced in the Royal Thai Government Gazette on June 11, 2019, after which the appointment of the Cabinet members was announced in the Royal Thai Government Gazette on July 10, 2019.

Although the election has been completed and a government has been formed, there can be no assurance that the political environment in Thailand will be stable. In fact, since early 2020, Thailand has been experiencing a series of political demonstrations demanding for, among other things, the resignation of the prime minister and a change to the constitution. The ultimate duration, intensity and impact of these demonstrations is subject to significant uncertainty. Any future instability in Thailand may materially and adversely affect our business, cash flow, financial condition, results of operations and prospects.

***We may be adversely affected by terrorist attacks and international and regional instability.***

Political events in the Middle East, including future terrorist attacks against targets in the Middle East, Southeast Asia or other regions, rumors or threats of terrorist attacks or war, actual conflicts involving the Middle East and trade disruptions, all of which may affect our suppliers or customers who are principally located in Thailand, may adversely affect our operations. In addition, there have been bombing incidents in Bangkok in recent years, and further bombings or other violent acts may occur in the future. For example, in August 2015, a bombing incident at the Erawan Shrine in Bangkok killed approximately 20 and injured many more. Violent acts arising from, and leading to, instability and unrest as well as political or economic developments related to these crises could adversely affect the Thai economy and the global economy and could have a material adverse effect on our business, financial condition, results of operations and prospects.

***We face risks related to public health epidemics in Thailand or elsewhere.***

Our business could be materially and adversely affected by the outbreak of public health epidemics, or the fear of such an outbreak, in Thailand or elsewhere. In April 2009, an outbreak of the H1N1 virus, commonly referred to as “swine flu,” occurred in Mexico and spread to other countries, including Thailand. In 2004, an outbreak of the H5N1 virus, also known as “bird flu,” occurred in Southeast Asia and other regions, resulting in hundreds of deaths worldwide and significantly affected Southeast Asia’s economy. Vietnam, a regional neighbor of Thailand, reported two human fatalities caused by bird flu in January 2012. Since the beginning of 2012, there have been reports on the outbreak of the viral hand, foot and mouth disease in Thailand and other neighboring countries, including several confirmed human cases and deaths, particularly among children. In January 2020, an outbreak of a strain of coronavirus, COVID-19, which originated in Wuhan, China, began to spread globally, with cases recorded in Australia, Italy, Japan, Korea, Thailand, the United States, among other countries. On January 30, 2020, the World Health Organization declared the COVID-19 outbreak a health emergency of international concern and subsequently declared this as a pandemic in March 2020. Governments in affected areas, including heavily industrial areas in China, Southeast Asia and other areas where we have suppliers and customers, have imposed a number of measures designed to contain the outbreak, including business closures, travel restrictions, quarantines and cancellations of gatherings and events. This in turn has impacted the operation of businesses, reduced regional travels and trade and lowered industrial production and consumption demand. See —“*The outbreak of COVID-19 (or any future pandemic or outbreak of severe communicable diseases) and measures taken in response thereto could adversely affect demand for our products, our business, results of operations and financial condition*” and “*Business—Recent Developments—COVID-19*” for further details on the impact of, and our response to, the COVID-19 pandemic.

If the outbreak of any of these viruses or other severe viruses, continues for an extended period, occurs again and/or increases in severity, it could have an adverse effect on economic activity in Thailand, and could materially and adversely affect our business, financial condition and results of operations. Similarly, any other future public health epidemics in Thailand or elsewhere could materially and adversely affect our business, financial condition, results of operations and prospects.

***Fluctuations in the value of the Baht could adversely affect demand for our products and our financial condition and results of operations.***

Substantially all of our revenues and feedstock costs are denominated in U.S. dollars or are pegged in terms of U.S. dollars, while fixed costs and administrative expenses are in Baht. We are exposed to currency exchange risk from our product-to-feed margin, which is the difference between our sales revenue and feedstock costs. Any depreciation of the Baht against the U.S. dollar tends to have a beneficial effect on our gross refining margins and product-to-feedstock margins. Conversely, any appreciation of the Baht against the U.S. dollar tends to have a detrimental effect on our gross refining margins and product-to-feedstock margins.

Adverse economic conditions in Thailand incidental to the depreciation of the value of the Baht could increase energy prices in Thailand and reduce overall demand for our products and those of our customers which may partially offset the benefits of depreciation. Significant fluctuations in the Baht against the U.S. dollar could have an adverse effect on our product-to-feed margin and results of operations.

Since the Asian financial crisis of 1997, the value of the Baht against the U.S. dollar has fluctuated. For example, the value of the Baht against the U.S. dollar has fluctuated from a high of THB45.78 on July 23, 2001 to a low of THB29.57 on November 10, 2010, and has remained in the range of THB28 to THB34 per US\$1.00 since then, according to the means of the average buying (transfer) rates and the average selling rates published by the Bank of Thailand. We cannot assure you that the value of the Baht will not decline or continue to fluctuate significantly against the U.S. dollar or other currencies in the future.

We have adopted a policy to minimize the effects of foreign currency fluctuations on our gross refining margins and product-to-feedstock margins with foreign currency loans such as to create a natural hedge. We also enter into forward contracts and currency swaps to manage exposure to fluctuations in foreign currencies on our financial results and our expenditures denominated in foreign currencies. As a result, we target to hedge 80% of our product-to-feed margins. Our hedging activities are designed to reduce, but do not eliminate, the effects of foreign currency fluctuations. Factors that could affect the effectiveness of our hedging activities include accuracy of sales forecasts, volatility of currency markets and the availability of hedging instruments. See “*Management’s Discussion and Analysis of Financial Condition and Results of Operations—Key Factors Affecting our Business—Foreign Exchange Rate Fluctuations.*”

As of December 31, 2020, we had total outstanding foreign currency debt of THB36,860.07 million (US\$1,228.3 million), and it is possible that a substantial portion of our capital expenditures for future expansion programs may be incurred and/or financed in foreign currencies. Any depreciation in the Baht against the U.S. dollar would increase our financing costs, and there can be no assurance that we would be able to generate revenue increases sufficient to offset such increased financing costs. As a result, fluctuations in the value of the Baht against other foreign currencies may adversely affect our business, financial condition, results of operations and prospects.

***Thailand is subject to potential sanctions from other countries which may impact its economy.***

In April 2015, the European Union gave Thailand a yellow card warning for its failure to address illegal, unreported and unregulated fishing in contravention of the European Union’s regulations regarding illegal, unreported and unregulated fishing. On June 18, 2015, the International Civil Aviation Organization (“ICAO”) “red flagged” Thailand for failing to solve significant safety concerns in accordance with applicable ICAO standards; the red flag status was lifted in October 2017. In regards to human trafficking, Thailand was placed in Tier 3 on the 2015 U.S. annual report on Trafficking in Persons issued by the State Department of the United States for its failure to fully comply with the minimum standards for the elimination of trafficking and the lack of significant efforts to ensure compliance. Thailand’s status was upgraded to the Tier 2 watchlist in 2016. While certain of these sanctions or statuses have been lifted, there can be no assurance that other sanctions or statuses will not be imposed on Thailand in the future. Such sanctions or the failure to comply with such international standards may have a material adverse effect on the Thai economy, which may in turn have a material adverse effect on the Group’s business, financial condition, results of operations and prospects.

***We prepare our financial statements on the basis of TFRS, which differs from IFRS.***

The financial statements included in this Offering Memorandum have been prepared in accordance with TFRS, guidelines promulgated by the Thailand Federation of Accounting Professions (the “TFAC”), applicable rules and regulations of the Thai Securities and Exchange Commission (the “Thai SEC”) and the Stock Exchange of Thailand, which differ in certain significant respects from IFRS. See “*Summary of Principal Differences*

*Between TFRS and IFRS.*” This Offering Memorandum does not include a reconciliation of our financial statements to IFRS, and there can be no assurance that such reconciliation would identify material quantitative differences. If our financial statements are prepared in accordance with IFRS, our results of operations and financial condition could be materially different.

Thailand is currently undergoing a program to converge TFRS with IFRS. The convergence with IFRS going forward as well as regular revision of accounting estimates and assumptions may impact our financial statements and, accordingly, their comparability with prior years’ financial statements. Furthermore, we may change the composition and/or the nature of our products and services in response to the accounting impact of changes introduced by the new IFRS-based TFRS. The preparation for compliance, as well as actual compliance, is likely to result in costs to us and may have a material adverse effect on our results of operations.

### **Risks Relating to the Structure of a Particular Issue of Notes**

A wide range of Notes may be issued under the Program. A number of these Notes may have features which contain particular risks for potential investors. Set out below is a description of certain such features.

#### ***Notes subject to optional redemption by us.***

An optional redemption feature is likely to limit the market value of Notes. During any period when we may elect to redeem Notes, the market value of those Notes generally will not rise substantially above the price at which they can be redeemed. This may also be true prior to any redemption period. We may be expected to redeem Notes when our cost of borrowing is lower than the interest rate on the Notes. At those times, an investor generally would not be able to reinvest the redemption proceeds at an effective interest rate as high as the interest rate on the Notes being redeemed and may only be able to do so at a lower rate. Potential investors should consider reinvestment risk in light of other investments available at that time.

#### ***Partly-Paid Notes.***

We may issue Notes where the issue price is payable in more than one instalment. Failure to pay any subsequent instalment on a Partly-Paid Note could result in an investor losing all of its investment.

#### ***Variable Rate Notes with a multiplier or other leverage factor.***

Notes with variable interest rates can be volatile investments. If they are structured to include multipliers or other leverage factors, or caps or floors, or any combination of those features or other similar related features, their market values may be even more volatile than those for securities that do not include those features.

#### ***Notes carrying an interest rate which may be converted from fixed to floating interest rates, and vice-versa.***

Fixed/Floating Rate Notes may bear interest at a rate that we may elect to convert from a fixed rate to a floating rate, or from a floating rate to a fixed rate. Our ability to convert the interest rate will affect the secondary market and the market value of such Notes since we may be expected to convert the rate when it is likely to produce a lower overall cost of borrowing. If we convert from a fixed rate to a floating rate, the spread on the Fixed/Floating Rate Notes may be less favorable than then prevailing spreads on comparable Floating Rate Notes tied to the same reference rate. In addition, the new floating rate at any time may be lower than the rates on other Notes. If we convert from a floating rate to a fixed rate, the fixed rate may be lower than then prevailing rates on its Notes.

Notes with floating interest rates can be volatile investments. If they are structured to include multipliers or other leverage factors, or caps or floors, or any combination of those features or other similar related features, their market values may be even more volatile than those for securities that do not include those features.

#### ***The benchmark rate for any Floating Rate Notes may not be available***

Interest rates and indices which are deemed to be “benchmarks,” (including the London Interbank Offered Rate (“**LIBOR**”) and the Euro Interbank Offered Rate (“**EURIBOR**”)) are the subject of ongoing national and international regulatory guidance and proposals for reform. Some of these reforms are already effective whilst others are still to be implemented. These reforms may cause such benchmarks to perform differently than in the past, to disappear entirely, or have other consequences which cannot be predicted. Any such consequence could have a material adverse effect on any Notes referencing such a benchmark.

Regulation (EU) 2016/1011 (the “**EU Benchmarks Regulation**”) and Regulation (EU) No. 2016/1011 as it forms part of domestic law of the United Kingdom by virtue of the European Union (Withdrawal) Act 2018 (the “**UK Benchmarks Regulation**”). apply to the provision of benchmarks, the contribution of input data to a benchmark and the use of a benchmark within the EU and the UK, respectively.

The EU Benchmarks Regulation and UK Benchmarks Regulation could have a material impact on any Notes linked to or referencing a benchmark in particular, if the methodology or other terms of the benchmark are changed in order to comply with the requirements of the EU Benchmarks Regulation or UK Benchmarks Regulation. Such changes could, among other things, have the effect of reducing, increasing or otherwise affecting the volatility of the published rate or level of the relevant benchmark.

More broadly, any of the international or national reforms, or the general increased regulatory scrutiny of benchmarks, could increase the costs and risks of administering or otherwise participating in the setting of a benchmark and complying with any such regulations or requirements. Such factors may have the effect of discouraging market participants from continuing to administer or contribute to certain “benchmarks,” trigger changes in the rules or methodologies used in certain “benchmarks” or lead to the discontinuance or unavailability of quotes of certain “benchmarks”. Specifically, the sustainability of LIBOR has been questioned as a result of the absence of relevant active underlying markets and possible disincentives (including possibly as a result of benchmark reforms) for market participants to continue contributing to such benchmarks. On July 27, 2017, and in a subsequent speech by its Chief Executive on July 12, 2018, the United Kingdom Financial Conduct Authority (the “**FCA**”) confirmed that it will no longer persuade or compel banks to submit rates for the calculation of the LIBOR benchmark after 2021 (the “**FCA Announcements**”). The FCA Announcements indicated that the continuation of LIBOR on the current basis cannot and will not be guaranteed after 2021. In addition, on November 29, 2017, the Bank of England and the FCA announced that, from January 2018, its Working Group on Sterling Risk-Free Rates has been mandated with implementing a broad based transition to the Sterling Overnight Index Average (“**SONIA**”) over the next four years across sterling bond, loan and derivative markets, so that SONIA is established as the primary sterling interest rate benchmark by the end of 2021.

Separate work streams are also underway in Europe to reform EURIBOR using a hybrid methodology and to provide a fallback by reference to a euro risk-free rate (based on a euro overnight risk-free rate as adjusted by a methodology to create a term rate). On September 13, 2018, the working group on euro risk-free rates recommended Euro Short-term Rate (“**ESTR**”) as the new risk free rate. The ESTR was published for the first time on 2 October 2019. In addition, on January 21, 2019, the euro risk free-rate working group published a set of guiding principles for fallback provisions in new euro denominated cash products (including bonds). The guiding principles indicate, among other things, that continuing to reference EURIBOR in relevant contracts may increase the risk to the euro area financial system. Although EURIBOR has been reformed in order to comply with the terms of the EU Benchmark Regulation, it remains uncertain as to how long it will continue in its current form, or whether it will be further reformed or replaced with ESTR or an alternative benchmark. This may cause LIBOR and EURIBOR to perform differently than they have done in the past, and may have other consequences which cannot be predicted. Such factors may have (without limitation) the following effects on certain benchmarks: (i) discouraging market participants from continuing to administer or contribute to a benchmark; (ii) triggering changes in the rules or methodologies used in the benchmark and/or (iii) leading to the disappearance of the benchmark.

Any of the above changes or any other consequential changes as a result of international or national reforms or other initiatives or investigations, could have a material adverse effect on the value of and return on any Notes linked to, referencing, or otherwise dependent (in whole or in part) upon, a benchmark. Investors should be aware that, if LIBOR or EURIBOR were discontinued or otherwise unavailable, the rate of interest on Floating Rate Notes which reference LIBOR or EURIBOR will be determined for the relevant period by the fallback provisions applicable to such Notes. Depending on the manner in which LIBOR or EURIBOR is to be determined under the Terms and Conditions, this may in certain circumstances (i) be reliant upon the provision by reference banks of offered quotations for LIBOR or EURIBOR which, depending on market circumstances, may not be available at the relevant time or (ii) result in the effective application of a fixed rate for Floating Rate Notes based on the rate which was last observed on the Relevant Screen Page. Any of the foregoing could have an adverse effect on the value or liquidity of, and return on, any Floating Rate Notes which reference LIBOR or EURIBOR.

***Notes issued at a substantial discount or premium.***

The market values of securities issued at a substantial discount or premium to their nominal amount tend to fluctuate more in relation to general changes in interest rates than do prices for conventional interest-bearing

securities. Generally, the longer the remaining term of the securities, the greater the price volatility as compared to conventional interest-bearing securities with comparable maturities.

***Index Linked Notes.***

We may issue Notes with principal or interest determined by reference to an index or formula, to changes in the prices of securities or commodities, to movements in currency exchange rates or other factors (each, a “**Relevant Factor**”). Each potential investor should be aware that:

- the market price of such Notes may be volatile and may be linked to factors other than our credit;
- they may receive no interest;
- payment of principal or interest may occur at a different time or in a different currency than expected;
- they may lose all or a substantial portion of their principal;
- a Relevant Factor may be subject to significant fluctuations that may not correlate with changes in interest rates, currencies or other indices;
- if a Relevant Factor is applied to Notes in conjunction with a multiplier greater than one or contains some other leverage factor, the effect of changes in the Relevant Factor on principal or interest payable likely will be magnified; and
- the timing of changes in a Relevant Factor may affect the actual yield to investors, even if the average level is consistent with their expectations.

In general, the earlier the change in the Relevant Factor, the greater the effect on yield. The historical experience of an index should not be viewed as an indication of the future performance of such index during the term of any Index Linked Notes. Accordingly, each potential investor should consult its own financial and legal advisers about the risk entailed by an investment in any Index Linked Notes and the suitability of such Notes in light of its particular circumstances.

***Dual Currency Notes.***

We may issue Notes with principal or interest payable in one or more currencies which may be different from the currency in which the Notes are denominated. Each potential investor should be aware that:

- the market price of such Notes may be volatile;
- they may receive no interest;
- payment of principal or interest may occur at a different time or in a different currency than expected; and
- the amount of principal payable at redemption may be less than the nominal amount of such Notes or even zero.

***Notes payable in more than one instalment.***

We may issue Notes where the issue price is payable in more than one instalment. Failure by a potential investor to pay a subsequent instalment of partly-paid Notes may result in it losing all of its investment.

***Notes may be issued with original issue discount for U.S. federal income tax purposes.***

Notes may be issued with original issue discount (“**OID**”) for U.S. federal income tax purposes. If the stated principal amount of such Notes exceeds their “issue price” by an amount that is equal to or greater than the statutory de minimis amount, the Notes will be treated as issued with OID for U.S. federal income tax purposes in an amount equal to such difference. If Notes are issued with OID for U.S. federal income tax purposes, U.S. investors will generally be required to include amounts representing OID in their gross income as it accrues in

advance of the receipt of cash payments attributable to such income using the constant yield method. See “*Taxation—United States Federal Income Taxation.*”

## **Risks Relating to the Guarantee**

### ***Certain provisions under the Guarantee may not be enforceable against the Guarantor in a Thai court.***

A judgment of a foreign court will not be enforced by a Thai court but may, at the sole discretion of the court, be admissible as evidence in an action in a Thai court. Therefore, even if the Trustee and the Holders have already obtained a judgment against the Guarantor in a foreign country, the Trustee and the Holders would still have to bring another action against the Guarantor in a Thai court. As the Guarantee is governed by New York law, in order for the Trustee and the Holders to enforce the Guarantee against the Guarantor in a Thai court, the Trustee and the Holders would be required to prove New York law to the satisfaction of the Thai court and such New York law must not be considered to be contrary to the public order or good morals of the people of Thailand. If the Thai court deems that the provisions of the Guarantee which the Trustee and the Holders are looking to enforce are contrary to the public order or good morals of the people of Thailand, such provisions will not be enforceable against the Guarantor. See “— *Thai guarantee law has imposed certain limitations and requirements which may adversely affect the Trustee and the Holders’ ability to enforce their rights under the Guarantee fully.*”

### ***Thai guarantee law has imposed certain limitations and requirements which may adversely affect the Trustee and the Holders’ ability to enforce their rights under the Guarantee fully.***

Even though the Trustee and the Holders may have certain rights as provided in the Guarantee, such rights may be limited under Thai guarantee law or not fully enforceable if certain procedures are not strictly followed. For instance, if an Event of Default (as defined under the “*Terms and Conditions of the Notes*”) shall occur and be continuing, the Trustee and the Holders may declare, among other things, the principal amount of the Notes and accrued and unpaid interest due and payable. However, under Thai guarantee law, the Guarantor may (in its absolute sole discretion) determine either to (i) pay in full the principal amount, together with accrued and unpaid interest to the date of payment or (ii) pay any amount under the Guaranteed Notes in accordance with the original payment schedule as if the Event of Default and acceleration had not occurred. If the Guarantor opts to make the payment in accordance with the original payment schedule rather than making the full payment in one lump sum, payment under the Guaranteed Notes will not be accelerated. In such a scenario, the Maximum Guaranteed Amount might not be sufficient to service the interest payable for the remaining term of the Guaranteed Notes and principal repayment at maturity (see “— *The Trustee and the Holders may not be able to recover any debt in excess of the Maximum Guaranteed Amount*”).

Thai guarantee law does not permit the Guarantor to contract out of its rights to raise its own defenses and defenses of the Issuer against the Trustee and the Holders in connection with claims under the Notes and the Indenture. Therefore, the Guarantor is able to assert any defenses it has and/or defenses of the Issuer against the Trustee and the Holders during the enforcement process of the Guarantee, which may materially and adversely affect the recovery of any amount claimed under the Guarantee from the Guarantor.

Thai guarantee law does not allow parties to contract out of the right of recourse of the guarantor against the debtor for principal and interest discharged by the guarantor including for losses and damages suffered or incurred by the guarantor by reason of its guarantee upon making partial payment under the underlying obligations. However, it is unclear from this provision of law as to whether the guarantor can agree to subordinate its rights to the holders of the Notes to which the guarantee relates in receiving payment from the debtor, which would effectively result in the guarantor only receiving payment from the debtor after all outstanding debts have fully been paid to such holders. There is currently no court decision or precedent as to how Thai courts will interpret and construe this Thai guarantee law provision. It is possible in the case of the Notes and the Guarantee that a Thai court could take the view that the Guarantor is able to take immediate recourse against the Issuer to the extent of any principal or interest discharged by it (whether in full or in part) and for losses and damages suffered or incurred by it by reason of its Guarantee, even though the terms of the Guarantee provide otherwise. Any such action on the part of the Guarantor could result in a lower recovery for the Holders in the event of any enforcement action in relation to the Notes and the Guarantee.

Thai guarantee law mandatorily releases the Guarantor from its obligations under the Guarantee if the Trustee or the Holders has granted the Issuer an extension of time to perform its obligations without consent of the Guarantor. Any pre-consent by the Guarantor in any agreements to any an extension of time to perform the Issuer’s obligations granted by the Trustee or the Holders is unenforceable.



***In order to enforce the Guarantee against the Guarantor, the Trustee and the Holders have to strictly comply with the requirements and procedures provided under the Thai guarantee law, some of which are still not definitively established. Failure to do so could limit the amounts recoverable under the Guarantee.***

Thai guarantee law requires that a creditor must send a written notice to a guarantor within 60 days of the date of the debtor's default, failing which the creditor shall not have the right to any interest or compensation that accrues after such 60-day period. Furthermore, the creditor shall not have the right to demand payment from the guarantor before such written notice reaches the guarantor. Therefore, if the Trustee or Holders gives a notice of default to the Guarantor later than 60 days from the date of the default, the Trustee and the Holders will not have the right to claim from the Guarantor interest, costs, damages or expenses payable following such 60-day period. In addition, Thai guarantee law uses the term "default" which has not been definitely established particularly whether it would include both monetary and a non-monetary breach of an agreement by the debtor, without it being required to constitute a typical "event of default" where usually a remedy period or grace period or a percentage voting requirement of creditors is accorded to. Therefore, it is easier for the Issuer to trigger monetary and non-monetary breaches of the Indenture than an occurrence of an Event of Default. If the Thai court takes the view that a default includes payment and non-payment default, and if the Trustee or Holders fails to give a notice of such default to the Guarantor within 60 days from the date of the default, the Trustee and the Holders will not be entitled to claim from the Guarantor interest, costs, damages or expenses payable following such 60-day period.

***The Trustee and the Holders may not be able to recover any debt in excess of the Maximum Guaranteed Amount.***

In accordance with the terms of the Guaranteed Notes under the Indenture, the Guarantor's obligations are limited to a Maximum Guaranteed Amount in respect of each Series of Guaranteed Notes. Unpaid principal, premium (if any) or interest on the relevant Series of Guaranteed Notes may end up being greater than the Maximum Guaranteed Amount and, as a result, the Trustee or Holders may not be able to recover amounts in excess of the Maximum Guaranteed Amount from the Guarantor or the Issuer.

***The Trustee and the Holders may not be able to recover any amounts under the Guarantee after the guaranteed period.***

Under Thai law, the Guarantor's obligations can only be enforced if they arise during a specified guaranteed period, and this is required to be set out in the documentation constituting the guarantee obligation. In order to comply with this law, under the terms of the Guaranteed Notes under the Indenture, the Guarantor will be released from its obligations under the Guarantee upon the earlier of (i) the date falling five years after the maturity date of the relevant Series of Notes or (ii) the date on which all sums expressed to be payable by the Issuer under the Indenture and the relevant Series of Guaranteed Notes have been unconditionally and irrevocably paid and discharged in full. As a result, the Trustee and Holders who enforce the Guarantee against the Guarantor may not be able to recover any amounts in the event that their claim is brought after the expiry of this period.

***The obligations of the Guarantor under the Guarantee will be released and discharged upon the obligations of the Issuer under the Indenture and the Notes having been extinguished.***

Under Thai guarantee law, following the extinguishment of the obligations of the Issuer under the Indenture and the Notes by any cause whatsoever, the Guarantor will be released from its obligations under the Guarantee, regardless of whether the obligations of the Issuer may have subsequently revived or been reinstated for whatever reasons. Although there are no precedents in interpreting this provision of law, if all amounts payable by the Issuer under the Indenture and the Notes have been fully satisfied by the Issuer, but the Trustee and/or the Holders are subsequently ordered by any competent authority to return all or portion of such sum to the Issuer or its creditors for whatever reasons, it is likely that the Trustee and/or the Holders will no longer have any right of recourse against the Guarantor under the Guarantee for such returned amount because the obligations of the Guarantor under the Guarantee will have already been released and discharged when the obligations of the Issuer under the Indenture and the Notes have been fully satisfied.

In such event, the rights of the Trustee and the Holders to recover in full any amounts claimed against the Guarantor under the Guarantee may be materially and adversely affected.

***The Guarantee provided by the Guarantor will be subject to certain limitations on enforcement and may be limited by applicable laws or subject to certain defenses that may limit its validity and enforceability.***

The Guarantee given by the Guarantor provides Holders with a direct claim against the Guarantor in respect of an Issuer's obligations under the Notes, subject to the Terms and Conditions of the Notes. Enforcement of the Guarantee would be subject to certain generally available defenses. Local laws and defenses may vary, and may include those that relate to corporate benefit (*ultra vires*), fraudulent conveyance or transfer (*action pauliana*), voidable preference, financial assistance, corporate purpose, liability in tort and subordination or similar laws and concepts. They may also include regulations or defenses which affect the rights of creditors generally.

If a court were to find the Guarantee given by the Guarantor, or a portion thereof, void or unenforceable as a result of such local laws or defense, or to the extent that agreed limitations on guarantees apply, Holders would cease to have any claim in respect of the Guarantor and would be creditors solely of the Issuer and, if payment had already been made under the Guarantee, the court could require that the recipient return the payment to the Guarantor.

***The bankruptcy law of Thailand differs from the laws of other jurisdictions with which the Holders may be familiar.***

The Guarantor was incorporated under the laws of Thailand, and principal assets of the Guarantor are located in Thailand. Insolvency proceedings by or against the Guarantor based on the bankruptcy law of Thailand may differ in significant respects from and may not be as favorable to Holders as compared to proceedings based on the laws of other jurisdictions with which the holders of the Notes may be familiar. For example, the courts of Thailand may not recognize the jurisdiction of the courts of foreign countries. Any order or judgment of a court in the foreign jurisdiction may not be enforceable outside of that jurisdiction.

#### **Risks Relating to the Notes and the Guarantee**

***The Notes and the Guarantee are unsecured obligations.***

The Notes and the Guarantee are unsecured obligations of the Issuers and the Guarantor, respectively. The repayment of the Notes and payment under the Guarantee may be adversely affected if:

- the Issuers or the Guarantor enters into bankruptcy, liquidation, reorganization or other winding-up proceedings;
- there is a default in payment under either of the Issuers' or the Guarantor's future secured indebtedness or other unsecured indebtedness; or
- there is an acceleration of any of the Issuers' or the Guarantor's indebtedness.

If any of these events were to occur, the Issuers' or the Guarantor's assets may not be sufficient to pay amounts due on the Notes or the Guarantee.

***Holders of the Notes may be subordinated to certain secured obligations of the Issuers and the Guarantor***

The Notes will be unsecured obligations of the Issuers and the Guarantor, respectively, and be effectively subordinated to any of their secured obligations to the extent of the assets serving as security therefor. The Indenture permits the Company and its Subsidiaries to incur certain secured indebtedness including but not limited to certain non-recourse secured bank loans and debt securities without being required to equally and ratably secure the Notes. Such additional secured debt incurred may be substantial. Accordingly, even if an event of default exists under the indenture, secured creditors of the Issuers and the Guarantor could foreclose on assets of the Issuers or the Guarantor (as the case may be) in which they have been granted a security interest, in each case to the exclusion of any holder of the Notes.

***Outward remittance of payments under the Indenture.***

The purchase and remittance of foreign currency by the Guarantor for the payment of any sum payable under the Guarantee to the Trustee or Holders is subject to applicable exchange control regulations. In principle, approval given by the BOT or an authorized agent of the BOT, which includes all commercial banks in Thailand, must be obtained immediately prior to each payment of a foreign currency out of Thailand. The authorized agent

of the BOT has the discretion to deny or impose conditions on any approval or remittance and may require relevant documents and evidence to be filed with it in connection with any application made to it. There can be no assurance that the BOT will not amend the exchange control regulations in the future to impose additional or stricter requirements in relation to outward remittance of foreign currency.

***The Notes may not be a suitable investment for all investors.***

Each potential investor in any Notes must determine the suitability of that investment in light of its own circumstances. In particular, each potential investor should:

- have sufficient knowledge and experience to make a meaningful evaluation of the relevant Notes, the merits and risks of investing in the relevant Notes and the information contained or incorporated by reference in this offering memorandum or any applicable supplement;
- have access to, and knowledge of, appropriate analytical tools to evaluate, in the context of its particular financial situation, an investment in the relevant Notes and the impact such investment will have on its overall investment portfolio;
- have sufficient financial resources and liquidity to bear all of the risks of an investment in the relevant Notes, including where principal or interest is payable in one or more currencies, or where the currency for principal or interest payments is different from the potential investor's currency;
- understand thoroughly the terms of the relevant Notes and be familiar with the behavior of any relevant indices and financial markets; and
- be able to evaluate (either alone or with the help of a financial advisor) possible scenarios for economic, interest rate and other factors that may affect its investment and its ability to bear the applicable risks.

Some Notes are complex financial instruments. Sophisticated institutional investors generally do not purchase complex financial instruments as stand-alone investments. They purchase complex financial instruments as a way to reduce risk or enhance yield with an understood, measured and appropriate addition of risk to their overall portfolios. A potential investor should not invest in Notes which are complex financial instruments unless it has the expertise (either alone or with the help of a financial advisor) to evaluate how the Notes will perform under changing conditions, the resulting effects on the value of such Notes and the impact this investment will have on the potential investor's overall investment portfolio. Investors may also be subject to investment laws that constrain their ability to invest in the Notes. Investors should consult their own legal advisors before making an investment in the Notes.

***Notes issued under the Program have no current active trading market and may trade at a discount to their initial offering price and/or with limited liquidity.***

Notes issued under the Program will be new securities which may not be widely distributed and for which there is currently no active trading market (unless in the case of any particular Tranche, such Tranche is to be consolidated with and form a single series with a Tranche of Notes which is already issued). If the Notes are traded after their initial issuance, they may trade at a discount to their initial offering price, depending upon prevailing interest rates, the market for similar securities, general economic conditions and our financial condition. If the Notes are trading at a discount, investors may not be able to receive a favorable price for their Notes, and in some circumstances investors may not be able to sell their Notes at all or at their fair market value. In addition, the market for investment grade and crossover grade debt has been subject to disruptions that have caused volatility in prices of securities similar to the Notes issued under the Program. Accordingly, we cannot assure you as to the development or liquidity of any trading market, or that disruptions will not occur, for any particular Tranche of Notes.

***Foreign exchange rate risks and exchange controls may result in investors receiving less interest or principal than expected.***

We will pay principal and interest on the Notes in the currency specified in the relevant Pricing Supplement (the "**Specified Currency**"). This presents certain risks relating to currency conversions if an investor's financial activities are denominated principally in a currency or currency unit (the "**Investor's**

**Currency**) other than the Specified Currency. These include the risk that exchange rates may significantly change (including changes due to devaluation of the Specified Currency or revaluation of the Investor's Currency) and the risk that authorities with jurisdiction over the Investor's Currency may impose or modify exchange controls. An appreciation in the value of the Investor's Currency relative to the Specified Currency would decrease (a) the Investor's Currency equivalent yield on the Notes, (b) the Investor's Currency equivalent value of the principal payable on the Notes and (c) the Investor's Currency equivalent market value of the Notes. Government and monetary authorities may impose (as some have done in the past) exchange controls that could adversely affect an applicable exchange rate. As a result, investors may receive less interest or principal than expected, or no interest or principal.

***Changes in market interest rates may adversely affect the value of Fixed Rate Notes.***

We expect that the trading price of Fixed Rate Notes will depend on a variety of factors, including, without limitation, the interest rate environment. Each of these factors may be volatile, and may or may not be within our control. If interest rates, or expected future interest rates, rise during the term of the Fixed Rate Notes, the trading price of the Fixed Rate Notes will likely decrease. Because interest rates and interest rate expectations are influenced by a wide variety of factors, many of which are beyond our control, we cannot assure you that changes in interest rates or interest rate expectations will not adversely affect the trading price of the Fixed Rate Notes.

***The credit ratings assigned to the Notes may not reflect all risks and may be lowered or withdrawn.***

One or more independent credit rating agencies may assign credit ratings to an issue of Notes and/or the Program. The ratings may not reflect the potential impact of all risks related to structure, market, additional factors discussed above and other factors that may affect the value of the Notes and/or the Program. Furthermore, we cannot assure you that a given credit rating will remain in effect for any period of time or that such rating will not be lowered, suspended or withdrawn. A downgrade or potential downgrade in a rating may reduce the number of investors in the Notes and adversely affect the price and liquidity of the Notes. A credit rating is not a recommendation to buy, sell or hold securities and may be revised or withdrawn by the rating agency at any time.

***The right to receive payments on the Notes is junior to certain tax and other liabilities preferred by law.***

The Notes will be subordinated to certain liabilities preferred by law such as claims of the Government of Thailand on account of taxes, certain liabilities owed to employees and certain liabilities incurred in the ordinary course of our business. In particular, in the event of bankruptcy, liquidation or winding up, our assets will be available to pay obligations on the Notes only after all liabilities that rank senior to these Notes have been paid. In the event of a bankruptcy, liquidation or winding up, there may not be sufficient assets remaining, after paying amounts relating to such proceedings, to pay amounts due on the Notes.

***The book-entry registration system of the Notes may reduce the liquidity of any secondary market for the Notes and may limit the receipt of payments by the beneficial owners of the Notes.***

Because transfers of interests in the global notes to be issued in the offering can be effected only through book entries at DTC with respect to the global notes to be issued in reliance on Rule 144A and only through book entries at Clearstream, Euroclear in the case of the global notes to be issued in reliance on Regulation S, for the accounts of their respective participants, the liquidity of any secondary market for global notes may be reduced to the extent that some investors are unwilling to hold Notes in book-entry form in the name of a DTC, Clearstream or Euroclear. The ability to pledge interests in the global notes may be limited due to the lack of a physical certificate. Beneficial owners of global notes may, in certain cases, experience delay in the receipt of payments of principal and interest since such payments will be forwarded by the paying agent to DTC, Clearstream or Euroclear, as applicable, who will then forward payment to their respective participants, who (if not themselves the beneficial owners) will thereafter forward payments to the beneficial owners of the interests in the global notes. In the event of the insolvency of DTC, Clearstream, Euroclear or any of their respective participants in whose name interests in the global notes are recorded, the ability of beneficial owners to obtain timely or ultimate payment of principal and interest on global notes may be impaired.

***The Notes are governed by the laws of the State of New York.***

The Terms and Conditions of the Notes are governed by the laws of the State of New York. No assurance can be given as to the impact of any possible judicial decision or change the laws of the State of New York or administrative practice after the date of the issue of the Notes.

***There are uncertainties in the enforcement of civil liabilities.***

All or a substantial portion of our assets and the assets of our directors and officers are located outside the United States. As a result, it may not be possible for investors to enforce against us or such persons in the United States, the federal securities laws of the United States, or to enforce judgments obtained in the United States courts predicated upon the civil liability provisions of the federal securities laws of the United States, including the Securities Act and the Exchange Act. We have been advised by Baker & McKenzie Ltd., our Thai counsel, that Thailand is not a party to the Hague Convention on the Recognition and Enforcement of Foreign Judgments in Civil and Commercial Matters and it has no bilateral treaties with other countries for the reciprocal recognition and enforcement of judgments. Moreover, there is no statutory basis in Thai law to apply the principle of comity to judgments from foreign courts.

Under Thai law, judgments entered by a United States court or any other non-Thai court, including actions under the civil liability provisions of the U.S. securities laws, are not automatically enforceable in Thailand. In order to pursue a claim against us, an investor would have to bring a separate action or claim in Thailand within the prescribed period of time to bring such actions under Thai law. While a non-Thai judgment could be introduced as evidence in a court proceeding in Thailand, a Thai court would be free to examine new issues arising in the case. Thai counsel has advised that in a court proceeding in Thailand, a Thai court would base its judgment on New York law, the governing law of the Notes and Indenture, provided that evidence satisfactory to the court as to the relevant provisions of New York law is provided to the court and such provisions are not contrary to Thai public order or good morals. Thus, to the extent that investors succeed in bringing legal actions against us outside Thailand, their available remedies and any recovery in any Thai proceeding may be limited. To the extent investors are entitled to any recovery in a currency other than Baht with respect to the Notes in any Thai proceedings, recovery might be converted to payments in Baht.

***The Notes are subject to transfer restrictions.***

The Notes will not be registered under the Securities Act or any state securities laws and may not be offered or sold within the United States or to, or for the account or benefit of, U.S. persons, except (i) in reliance on the exemption provided by Rule 144A to persons who are both qualified institutional buyers as defined in Rule 144A and qualified purchasers as defined in the U.S. Investment Company Act, (ii) to certain persons in offshore transactions in reliance on Regulation S, or pursuant to another exemption from, or (iii) in another transaction not subject to, the registration requirements of the Securities Act and in accordance with applicable state securities laws. For a further discussion of the transfer restrictions applicable to the Notes, see “*Subscription and Sale*” and “*Transfer Restrictions*.”

***Holders of the Notes will rely on DTC, Euroclear and Clearstream procedures.***

Notes issued under the Program will be represented on issue by one or more Global Notes that may be deposited with a common depository for Euroclear and Clearstream or may be deposited with a nominee for DTC (each as defined under “*Form of the Notes*”). Except in the circumstances described in each Global Note, investors will not be entitled to receive Notes in definitive form. Each of DTC, Euroclear and Clearstream and their respective direct and indirect participants will maintain records of the beneficial interests in each Global Note held through it. While the Notes are represented by a Global Note, investors will be able to trade their beneficial interests only through the relevant clearing systems and their respective participants.

While the Notes are represented by Global Notes, we will discharge our payment obligation under the Notes by making payments through the relevant clearing systems for distribution to their accountholders. A holder of a beneficial interest in a Global Note must rely on the procedures of the relevant clearing system and its participants to receive payments under the Notes. We have no responsibility or liability for the records relating to, or payments made in respect of, beneficial interests in any Global Note.

Holders of beneficial interests in a Global Note will not have a direct right to vote in respect of the Notes so represented. Instead, such holders will be permitted to act only to the extent that they are enabled by the relevant clearing system and its participants to appoint appropriate proxies.

***Holders of the Notes may be exposed to risks relating to Singapore taxation***

Certain Tranches of Notes to be issued from time to time under the Program during the period from the date of this Offering Memorandum to December 31, 2023 may be intended to be “qualifying debt securities” for

the purposes of the Income Tax Act, Chapter 134 of Singapore (“**ITA**”), subject to the fulfilment of certain conditions more particularly described in the section titled “*Taxation – Singapore Taxation.*”

However, there is no assurance that such Tranche of Notes would be or continue to be “qualifying debt securities” or enjoy the tax concessions for “qualifying debt securities” should the relevant tax laws be amended or revoked at any time or should the required conditions cease to be fulfilled.

## **USE OF PROCEEDS**

The net proceeds from an issue by the Company of a Tranche of Notes will be used by us for general corporate purposes, including, but not limited to, debt repayment, funding acquisitions and investment activities and on-lending to entities within the Group.

The net proceeds from an issue by the Treasury Center of a Tranche of Notes will be applied by the Treasury Center for general corporate purposes, including, but not limited to, debt repayment, funding acquisitions and investment activities and on-lending to entities within the Group.

If, in respect of any particular issue, there is a particular identified use of proceeds, this will be stated in the applicable Pricing Supplement.

## CAPITALIZATION AND INDEBTEDNESS

The following table sets forth our consolidated capitalization and indebtedness as of December 31, 2020.

This table should be read in conjunction with our audited consolidated financial statements and the notes related thereto included elsewhere in this Offering Memorandum.

	As of December 31, 2020	
	(in millions)	
	THB	US\$
<b>Indebtedness</b>		
Short-term borrowings from financial institutions .....	19.0	0.6
Current portion of long-term borrowings from financial institutions .....	1,974.4	65.8
Current portion of long-term borrowings from other parties .....	44.7	1.5
Current portion of debentures .....	19,997.5	666.4
Long-term borrowings from financial institutions .....	60,977.0	2,031.9
Long-term loans from other parties .....	249.3	8.3
Debentures (other than Notes offered herein) .....	65,034.5	2,167.1
Lease liabilities .....	6,787.0	226.2
<b>Total debt</b> .....	<b>155,083.4</b>	<b>5,167.7</b>
<b>Shareholders' equity</b>		
Issued and paid-up share capital .....	45,088.5	1,502.4
Treasury stock .....	(1,187.6)	(39.6)
Share premium .....	36,936.8	1,230.8
Premium on treasury stock .....	1,386.7	46.2
Difference arising from business combination under common control .....	1,690.7	56.3
Difference arising from the change in the ownership interest in an investment .....	(3,407.7)	(113.6)
Put option over non-controlling interest .....	(1,286.1)	(42.9)
<b>Retained earnings</b>		
Appropriated		
Legal reserve .....	4,512.9	150.4
Loan repayment reserve .....	807.8	26.9
Projects expansion reserve .....	12,447.0	414.8
Treasury stock reserve .....	1,187.6	39.6
Unappropriated .....	183,652.4	6,119.7
Other components of equity .....	(813.9)	(27.1)
<b>Equity attributable to owners of the parent</b> .....	<b>281,015.1</b>	<b>9,364.0</b>
Non-controlling interests .....	7,978.9	265.9
<b>Total equity</b> .....	<b>288,994.0</b>	<b>9,629.9</b>
<b>Total capitalization</b> <sup>(1)</sup> .....	<b>444,077.4</b>	<b>14,797.6</b>

Note:

(1) Total capitalization includes total debt and equity.

Other than as indicated herein, there have been no material changes to our capitalization or indebtedness since December 31, 2020.



## SELECTED CONSOLIDATED FINANCIAL AND OTHER DATA

You should read the following selected consolidated financial data in conjunction with our consolidated financial statements, together with each of their related notes, “Presentation of Financial and Other Information,” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” included elsewhere in this Offering Memorandum. Our consolidated financial statements have been prepared and presented in accordance with TFRS, which differs in certain respects from IFRS. See “Summary of Principal Differences Between TFRS and IFRS.”

### Selected Consolidated Financial and Other Data

The following tables set forth our selected consolidated financial information for the years ended December 31, 2018, 2019 and 2020.

#### Selected Consolidated Statement of Income (Loss) Information:

	For the year ended December 31,			
	2018	2019	2020	
	THB	THB	THB	US\$
	(in millions)			
Revenue from sale of goods and rendering of services .....	518,654.7	412,810.3	329,291.2	10,972.7
Cost of sale of goods and rendering of services.....	(466,025.8)	(390,619.3)	(317,093.4)	(10,566.3)
<b>Gross profit .....</b>	<b>52,629.0</b>	<b>22,191.0</b>	<b>12,197.8</b>	<b>406.5</b>
Investment income.....	1,577.3	1,000.8	362.4	12.1
Other income .....	1,117.1	1,317.9	1,920.2	64.0
Gain on bargain purchases.....	1,354.9	31.5	—	—
Selling and distribution expenses .....	(3,405.8)	(3,931.4)	(3,687.1)	(122.9)
Administrative expenses.....	(11,448.5)	(12,537.3)	(11,194.1)	(373.0)
Reversal of (expenses from) raw materials derogation .....	(2,003.6)	232.5	—	—
Reversal of impairment losses on assets .....	—	—	312.7	10.4
Net derivative gain .....	122.0	1,498.8	1,168.9	38.9
Net gain (loss) on foreign exchange rate.....	13.1	1,755.5	(349.5)	(11.6)
Finance costs .....	(3,593.4)	(3,119.4)	(3,511.1)	(117.0)
Share of profit of investments in joint ventures .....	5,208.7	2,625.7	863.2	28.8
Share of profit of investments in associates.....	1,686.1	1,933.1	2,459.4	82.0
<b>Profit before income tax expense ..</b>	<b>43,256.9</b>	<b>12,998.7</b>	<b>542.6</b>	<b>18.1</b>
Income tax benefit (expense).....	(2,986.0)	(649.4)	109.3	3.6
<b>Profit for the year .....</b>	<b>40,271.0</b>	<b>12,349.3</b>	<b>651.9</b>	<b>21.7</b>
<b>Profit attributable to:</b>				
Owners of the Company .....	40,069.5	11,682.1	199.6	6.6
Non-controlling interests .....	201.5	667.2	452.3	15.1
<b>Profit for the year .....</b>	<b>40,271.0</b>	<b>12,349.3</b>	<b>651.9</b>	<b>21.7</b>
<b>Basic earnings per share (Baht) ....</b>	<b>8.89</b>	<b>2.59</b>	<b>0.04</b>	<b>0.00</b>

*Selected Consolidated Statement of Financial Position Information:*

	As of December 31,			
	2018	2019	2020	
	THB	THB	THB	US\$
	(in millions)			
Cash and cash equivalents .....	36,744.0	18,840.3	44,313.0	1,476.6
Total current assets .....	144,310.0	104,494.3	129,911.0	4,328.9
Total non-current assets .....	324,945.3	348,020.1	359,471.7	11,978.4
<b>Total assets .....</b>	<b>469,255.3</b>	<b>452,514.4</b>	<b>489,382.7</b>	<b>16,307.3</b>
Total current liabilities.....	73,858.2	53,033.1	59,041.5	1,967.4
Total non-current liabilities .....	91,914.9	105,885.9	141,347.2	4,710.0
<b>Total liabilities.....</b>	<b>165,773.1</b>	<b>158,919.0</b>	<b>200,388.7</b>	<b>6,677.4</b>
<b>Total equity .....</b>	<b>303,482.2</b>	<b>293,595.4</b>	<b>288,994.0</b>	<b>9,629.9</b>
<b>Total liabilities and equity.....</b>	<b>469,255.3</b>	<b>452,514.4</b>	<b>489,382.7</b>	<b>16,307.3</b>

*Selected Consolidated Statement of Cash Flow Information:*

	For the year ended December 31,			
	2018	2019	2020	
	THB	THB	THB	US\$
	(in millions)			
Net cash from operating activities ...	53,629.0	30,175.0	22,145.8	737.9
Net cash used in investing activities	(32,841.6)	(41,780.0)	(28,274.5)	(942.2)
Net cash from (used in) financing activities .....	(27,397.4)	(6,460.6)	31,793.8	1,059.4
Effect of exchange rate changes on cash and cash equivalents and effect from translation differences on financial statements.....	(75.4)	161.9	(192.4)	(6.4)
Cash and cash equivalents as of the beginning of the year.....	43,429.4	36,744.0	18,840.3	627.8
Cash and cash equivalents as of the end of the year.....	36,744.0	18,840.3	44,313.0	1,476.6

**Certain Other Financial and Operational Information**

	<b>For the year ended December 31,</b>			
	<b>2018</b>	<b>2019</b>	<b>2020</b>	
	<b>THB</b>	<b>THB</b>	<b>THB</b>	<b>US\$</b>
	<b>(in millions, unless otherwise stated)</b>			
<b>ADJUSTED EBITDA Data:</b>				
ADJUSTED EBITDA <sup>(1)</sup> .....	58,263.3	27,801.8	20,290.5	676.1
ADJUSTED EBITDA margin (%) <sup>(2)</sup> .....	11.2	6.7	6.2	—
<b>Certain Other Financial Information and Ratios:</b>				
Total Debt <sup>(3)</sup> .....	96,907.1	107,087.4	155,083.4	5,167.7
Net Debt <sup>(4)</sup> .....	43,345.2	81,527.3	94,425.1	3,146.5
Total Debt to ADJUSTED EBITDA (times) <sup>(5)</sup> .....	1.7	3.9	7.6	—
Net Debt to ADJUSTED EBITDA (times) <sup>(6)</sup> .....	0.7	2.9	4.7	—
ADJUSTED EBITDA to Finance Costs (times) <sup>(7)</sup> .....	16.2	8.9	5.8	—
Net Debt to Equity (times) <sup>(8)</sup> .....	0.1	0.3	0.3	—

**Notes:**

(1) ADJUSTED EBITDA means profit for the year excluding income tax benefit (expense), finance costs, interest income, dividend income, share of profit of investments in joint ventures, share of profit of investments in associates, depreciation and amortization and others.

(2) ADJUSTED EBITDA margin means ADJUSTED EBITDA divided by the sum of revenue from sale of goods and revenue from rendering of services.

(3) Total debt means the sum of short-term loans from financial institutions, long-term loans from financial institutions, long-term loans from others and debentures. For the year December 31, 2020, total debt includes lease liabilities following the adoption of TFRS 16.

(4) Net debt means total debt less (i) cash and cash equivalents and (ii) current investments in financial assets.

(5) Calculated from total debt divided by ADJUSTED EBITDA.

(6) Calculated from net debt divided by ADJUSTED EBITDA.

(7) Calculated from ADJUSTED EBITDA divided by finance costs.

(8) Calculated from net debt divided by total shareholders' equity.

The following table shows a reconciliation of ADJUSTED EBITDA to profit for the year for the periods indicated.

	For the year ended December 31,						
	2018		2019		2020		
	THB	Margin	THB	Margin	THB	US\$	Margin
	(in millions, unless otherwise stated)						
Revenue from sale of goods and rendering of services .....	518,654.7	100.0%	412,810.3	100.0%	329,291.2	10,972.7	100%
<b>Profit for the year .....</b>	<b>40,271.0</b>	<b>7.8%</b>	<b>12,349.3</b>	<b>3.0%</b>	<b>651.9</b>	<b>21.7</b>	<b>0.2%</b>
<b>Adjusted for:</b>							
Income tax expense .....	2,986.0	0.6%	649.4	0.2%	(109.3)	(3.6)	0.0%
Finance costs.....	3,593.4	0.7%	3,119.4	0.8%	3,511.1	117.0	1.1%
Interest income...	(1,176.1)	(0.2%)	(989.4)	(0.2%)	(342.5)	(11.4)	(0.1%)
Dividend income	(37.1)	0.0%	(11.4)	0.0%	(17.4)	(0.6)	0.0%
Share of profit of investments in joint ventures .	(5,208.7)	(1.0%)	(2,625.7)	(0.6%)	(863.2)	(28.8)	(0.3%)
Share of profit of investments in associates .....	(1,686.1)	(0.3%)	(1,933.1)	(0.5%)	(2,459.4)	(82.0)	(0.7%)
Depreciation and amortization ...	19,279.0	3.7%	19,513.9	4.7%	20,377.1	679.0	6.2%
Others <sup>(1)</sup> .....	242.0	0.0%	(2,270.6)	(0.6%)	(457.7)	(15.3)	(0.1%)
<b>ADJUSTED EBITDA.....</b>	<b>58,263.3</b>	<b>11.2%</b>	<b>27,801.8</b>	<b>6.7%</b>	<b>20,290.5</b>	<b>676.1</b>	<b>6.2%</b>

Note:

(1) Others is comprised of gain from private fund, loss from fair value adjustments, gain on bargain purchases, loss on impairment of assets, expenses and reversals of expenses from raw materials derogation, unrealized and realized gain/loss from non-commodity derivatives, and gain/loss from foreign exchange rate..

## MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

*The following discussion and analysis should be read in conjunction with our consolidated financial statements and information and notes thereto included elsewhere in this Offering Memorandum. Except as otherwise indicated, all financial information set forth herein has been presented in Thai Baht in conformity with TFRS, which differs in certain material respects from IFRS.*

*Effective January 1, 2020, we adopted TFRS 9 (Financial Instruments) and TFRS 16 (Leases) which resulted in changes in our accounting policy for fair value measurement of financial instruments and for leases (specifically for those leases formerly classified as operating and finance lease arrangements where we are the lessee), respectively. As a result of the implementation of TFRS 16, a lessee is required to recognize a right-of-use asset and a lease liability at the commencement of all leases, except for short-term leases and leases of low value assets. The impact of the adoption of TFRS 16 and our policies on the application of TFRS 16 are discussed further in Notes 2.6, 3.11 and 15 to our audited financial statements included elsewhere in this Offering Memorandum.*

*For a description of certain differences between TFRS and IFRS, see "Summary of Principal Differences between TFRS and IFRS." All financial information as of and for the years ended December 31, 2018, 2019 and 2020 is set forth below on a consolidated basis.*

### Overview

We are the largest integrated petrochemical and petroleum refining company in Thailand and the second largest in Southeast Asia measured by nameplate capacity. We derive the majority of our sales and operating revenue from the sale of refined petroleum products, aromatics products and olefins on-sold to intermediate and downstream petrochemical plants. We also derive revenue from the sale of polymer resins for the manufacture of plastic products, EO-based performance products such as MEG and ethanalamines, green chemicals such as methyl ester, fatty acids, glycerine and fatty alcohols that are processed from non-fossil materials and other specialty products relating to phenol, bis-phenol A, and hexamethylene diisocyanate ("HDI") and HDI derivatives.

Our revenue from sale of goods and rendering of services and net profit attributable to owner of the parent for the year ended December 31, 2020 was THB329,291.2 million (US\$10,972.7 million) and THB199.6 million (US\$6.6 million), respectively.

We are listed on the Stock Exchange of Thailand under the stock code "PTTGC" with a market capitalization of THB263,767.7 million (US\$8,789.3 million) as of December 31, 2020 .

### Key Factors Affecting Our Businesses

Our results of operations are driven by a combination of factors affecting the refining, petrochemical and specialty chemicals industries generally, including general economic conditions, global supply and demand for our products, product and feedstock prices and the spreads between product and feedstock prices, production volumes at our plants and foreign exchange fluctuations. Our results of operations are also impacted by company-specific structural and operational factors, such as our relationship with PTT and our product mix optimization. Set forth below is an overview of the key drivers that have affected our historical results of operations and are expected to continue to affect our future results of operations.

### *Relationship with PTT*

For the year ended December 31, 2020, we sourced 100.0%, 100.0% and 99.0% of our crude oil, condensate and natural gas feedstock, respectively, under feedstock supply agreements with PTT, our major shareholder. We benefit from a strategically-aligned relationship with PTT, given our position as the PTT Group's principal petrochemical company and PTT is both our principal offtaker of products and principal supplier of feedstock. Our relationship with PTT allows us to benefit from PTT's market position, expertise and customer base. PTT's position as our principal feedstock supplier and principal offtake customer provides important stability to our business. Our membership within the PTT Group, which is involved in major areas of the natural gas, petroleum and petrochemical businesses in Thailand, also provides us with significant economies of scale, discounts through bulk purchases, business opportunities and group synergies.

While we believe the pricing we receive under our long-term feedstock contracts with PTT is generally better than pricing we would obtain under short-term contracts with other suppliers or in the international spot markets for Southeast Asia and East Asia, our pricing and profit sharing arrangements with PTT, and their underlying

price formulas, are subject to arm's length negotiations. As our price formulas are renegotiated and revised from time to time, a significant increase in PTT's production costs and other cost variables in our pricing formulas, such as the price of crude oil, may result in increased feedstock prices for us. Such revisions to the pricing formulas may negatively impact our business and results of operations.

For further information regarding our relationship with PTT and the risks to us if we were to lose the support of PTT, see "*Risk Factors—Risks Relating to Our Business—We are heavily dependent on our relationship with PTT as our supplier, customer and major shareholder.*"

### ***Macroeconomic Conditions***

Our results of operations are directly affected by sales volume and sales prices of our products, which in turn are influenced by general macroeconomic conditions faced by our customers globally and in Thailand.

Events such as the decision of OPEC and non-OPEC members to reduce OECD oil stocks and the resulting decrease in OPEC production along with unrest in the Middle East and oil-producing countries, the COVID-19 pandemic and the global economic recovery and expected increased demand for crude oil from China and India has affected the demand for and prices of our products. Spreads between product prices as measured against feedstock prices, including the spread between gas oil or diesel prices as measured against the price of Dubai crude oil, the spreads between paraxylene prices as measured against the price of condensate decreased generally in 2020 as compared to 2019.

In addition, as most of our assets and operations are located in Thailand, we are affected by macroeconomic conditions in Thailand. According to the National Economic and Social Development Board, Thailand's GDP grew by 4.2% in 2018, 2.3% in 2019 and -6.1% in 2020. We believe that the future economic growth of Thailand and our business could be impacted by the Thai Government's macro-management plans and the ways in which these plans are implemented. See "*Risk Factors—Risks Relating to Our Business—Cyclicality in the petrochemical and refining industries may result in reduced volumes or operating margins, and uncertainty regarding the global economic recovery could have a material adverse effect on us in the future.*"

### ***Supply and Demand in the Petroleum Refining Industry***

The petroleum refining industry has experienced steady growth in demand for refinery products, cyclical margins due to periodic over-capacity and supply shortages in various regional markets, and seasonal fluctuations in the consumption of particular types of refinery products, such as higher gasoline and diesel consumption during the summer driving season, and higher home heating oil consumption during the winter months. Global and domestic supply and demand conditions influence the price of crude oil, which in turn influences the prices of our refinery products. The Dubai crude oil price averaged US\$42.21 per barrel in 2020, representing a 34% decrease from the previous year's average of US\$63.53 per barrel. This was primarily due to the pressure from various measurements take worldwide (such as lockdowns and stay-at-home orders) to control the spread of COVID-19, which impacted to crude oil demand. In addition, there were increased tensions between Saudi Arabia and Russia since both parties could not reach an agreement for crude oil production.

The general slowdown in the growth of demand for refinery products resulted in decreases in gasoline crack spread, jet crack spread and diesel crack spread in 2020 as compared to 2019. As a consequence of the decrease in the spreads of product price to Dubai crude oil price across the industry in 2020 as compared to 2019, our refining business segment reported a decrease in revenues in 2020.

### ***Supply and Demand in the Petrochemical Industry***

Margins in the petrochemical industry are strongly influenced by capacity utilization. Generally, as demand for petrochemical products approaches available supply, utilization rates rise, and prices and margins typically increase. Historically, this relationship has been highly cyclical due to fluctuations in supply resulting from the timing of new investments in capacity by producers and general economic conditions affecting the relative strength or weakness of demand. Generally, capacity is more likely to be added during periods when current or expected future demand is strong and margins are, or are expected to be, high. Investments in new capacity when demand falls below expected levels can result, and in the past frequently have resulted, in over-capacity, which typically leads to a reduction of margins. In response, petrochemical producers typically reduce capacity or limit further capacity additions, eventually causing the market to be relatively undersupplied.

Spreads of aromatics product over condensate declined in 2020 compared to 2019 primarily due to increases in global supply of products, namely paraxylene and benzene, that are used in downstream products such as

electronic parts, computer parts, polyester, fiber and resin products. In 2020, the paraxylene market faced pricing pressure from an increase in global supply, primarily from China. In addition, in the first half of 2020, the benzene market faced pricing pressure as a result of the high inventory level in China and a decline in downstream demand due to the planned maintenance shutdown of several downstream plants and the COVID-19 pandemic. However, in late 2020, the benzene market was supported by a stimulus package in China and changes in consumer behavior generally that were focused on hygiene awareness. The average paraxylene FECP price to condensate price spread decreased to US\$229 per metric ton for 2020, compared to US\$351 per metric ton in 2019, while benzene Korea price to condensate price spread increased to US\$136 per metric ton, for 2020, compared to US\$97 per metric ton for 2019.

Spreads of olefins and derivatives also decreased from 2019 to 2020. For example, polyethylene prices decreased in 2020 as the COVID-19 pandemic impacted to the demand throughout the year, although there has been demand recovery as inventories restocking in late 2020. The average price of HDPE, LLDE and LDPE decreased to US\$880 per ton, US\$867 per ton and US\$1,010 per ton, respectively, in 2020, compared to US\$991 per ton, US\$952 per ton and US\$1,019 per ton, respectively, in 2019. Likewise, the average price of MEG decreased to US\$627 per ton in 2020, compared to US\$754 per ton in 2019.

### ***Prices of Feedstock***

Feedstock costs are a significant component of the operating costs of both our refinery and petrochemical business. Specifically, the production of refined petroleum products is dependent on the available supply of crude oil, while the costs of the feedstock we require to make our petrochemical products (principally condensate, naphtha, LPG, NGL, ethane and propane) are principally driven by the price of oil and natural gas. The prices of our feedstock are generally subject to frequent and significant fluctuations and are affected by global supply and demand. The average price for Dubai crude oil decreased from US\$63.53 per barrel in 2019 to US\$42.21 per barrel in 2020. The average price of condensate decreased from US\$544 per metric ton in 2019 to US\$350 per metric ton in 2020. The average Naphtha Mean-of-Platts price (“**Naphtha-MOPJ**”) also decreased from US\$523 per metric ton in 2019 to US\$380 per metric ton in 2020.

Fluctuations in feedstock prices also affect the gross refining margin of our refinery and our aromatics product-to-feedstock margin, as there is a lag time between the time that we pay for crude oil and other feedstock and the time that we sell the resulting refined and aromatics products. As a result, the gross refining margin of our refinery and our aromatics product-to-feedstock margin are affected by changes in feedstock prices between the date that such feedstock is accounted for as inventory and the date of sale of the resulting refined and aromatics products. See “—Key Metrics by which We Measure Our Business—Key Metrics for Our Refinery Business Segment—Gross Refining Margin” and “—Key Metrics by which We Measure Our Business—Key Metrics for Our Aromatics Business Segment—Product-to-Feedstock Margin.”

Changes in feedstock prices also have a direct impact on our working capital needs. In general, increases in feedstock prices lead to an increase in our working capital needs and *vice versa*.

Our feedstock prices may also be affected by fluctuations in the published spot prices of certain petrochemical products, as the pricing of feedstock under certain of our feedstock agreements, such as our natural gas feedstock supply contracts with PTT, is calculated by reference to certain published spot prices, such as the Southeast Asia spot price of polyethylene. Changes in the published spot prices of such products therefore result in corresponding changes to the prices of our feedstock under certain of our feedstock agreements.

### ***Product Mix Optimization***

Our business, financial condition, results of operation and prospects are affected by our product mix, which is the mix of products we produce to meet the demand from our customers and optimize our sales. Our product mix is driven by the types, quantities and market pricing of various refined petroleum, aromatics, olefins and other petrochemical products purchased by our customers. We cannot, however, solely refine or produce products with the highest selling prices, as the refining and production process produces a variety of different product types in varying volumes. In formulating our product mix, we seek to maximize our overall gross profit margin while producing a mix of products that will match customer demand as closely as possible for any given period.

Our refinery’s configuration allows us to process heavier, less expensive crude oil compared to competitors with less complex plants, while still producing high-value, clean fuels. The configuration is oriented towards maximizing middle distillates (hydrocracking) and re-directing reformat to produce aromatics products at two of our aromatics complexes. We also have the ability to make high quality refined products. Our aromatics units also allow feedstock and product exchange to optimize the production of paraxylene and benzene. Our feedstock

flexibility allows us to manage our product mix for downstream products more effectively, as we are able to tailor our feedstock mix to produce the desired composition for our product mix more optimally. See “*Business—Our Business Segments and Products—Refinery*” for more details regarding our feedstock slate.

Generally, we believe our feedstock slate is more complex and flexible than those of many of our competitors. Our refinery and production units are therefore better positioned to take advantage of more cost-effective feedstock, and we are able to benefit from optimization of our product mix and incremental gross margin opportunities for our refinery and production units.

During the COVID-19 pandemic, our refinery temporarily adjusted our production strategy by adjusting production of jet fuel to zero in order to align with customer demand.

### ***Production Volume and Utilization***

Our results of operations are materially influenced by the degree to which we utilize our assets in order to achieve maximum production volumes. The utilization rate of our production facilities affects our operating expenses per barrel or per metric ton, as applicable, and our gross profit margin. Higher utilization rates help spread our fixed operating expenses over a larger amount of products which reduces our unit cost of production. We believe in maximizing the utilization and capacity of our facilities. We believe this allows us to maintain positive margins and cash flows, even during downturns in industry cycles or customer demand, more readily than some of our competitors who have higher production costs. We intend to achieve growth in production volume by improving utilization rates within the defined availability of our assets, improving availability of our assets by minimizing planned and unplanned facility shutdowns and improving capacity of our assets through debottlenecking projects.

Our utilization rate is also impacted by actual plant shutdown time for scheduled and unscheduled maintenance, including the time necessary to gradually reduce production for the shutdowns and to recover to full production following the shutdown.

The number and length of turnarounds (scheduled outages of a unit in order to perform necessary inspections and testing to comply with industry regulations and to permit us to carry out any maintenance activities that may be necessary) carried out in any given period can impact operating results. We routinely schedule turnarounds for each plant every three to five years for periods of approximately 15 to 45 days and on a staggered basis to minimize impact on our overall production. When possible, we seek to schedule the timing of turnarounds to coincide with periods of the scheduled shutdowns of gas feedstock suppliers and relatively lower demand for the products of the relevant units.

For a discussion of the production volumes and the utilization rates of our various business units and the details of our plant shutdowns, see “*Business—Our Business Units and Products*” and “*Business—Plant Maintenance*,” respectively.

### ***Foreign Exchange Rate Fluctuations***

Our results of operations may be affected by both the transaction effects and translation effects of foreign currency exchange rate fluctuations between the U.S. dollar and the Baht. Substantially all of our revenues and feedstock costs are denominated in U.S. dollars or are pegged in terms of U.S. dollars, while our fixed costs and administrative expenses are denominated in Baht. While the matching of revenue from our products and our feedstock costs in U.S. dollars or U.S. dollar-linked currencies provide a partial natural hedge, we are exposed to changes in the value of the U.S. dollar against the Baht. Depreciation in the value of the Baht against the U.S. dollar tends to have a beneficial effect on our gross refining margins and product-to-feedstock margins. Conversely, appreciation in the value of the Baht against the U.S. dollar tends to have a detrimental effect on our gross refining margins and product-to-feedstock margins. We also have outstanding foreign currency debt totaling THB36,860.1 million (US\$1,228.3 million) as of December 31, 2020 and may incur and/or finance a substantial portion of our capital expenditures for future expansion programs in foreign currencies. Any depreciation in the Baht against the U.S. dollar would increase our finance costs.

The Baht has strengthened against the U.S. dollar by approximately 0.4% from December 31, 2019 to December 31, 2020.

We engage in hedging activities, including forward contracts and currency swaps, to manage exposure to fluctuations in foreign currencies on our financial results. Our hedging activities are designed to reduce, but do not eliminate, the effects of foreign currency fluctuations. Factors that could affect the effectiveness of our hedging activities include accuracy of sales forecasts, volatility of currency markets and the availability of hedging



instruments. We also incur U.S. dollar indebtedness to provide an indirect accounting hedge against the appreciation of the Baht against the U.S. dollar. The gain resulting from the translation of our U.S. dollar indebtedness into Baht as the Baht appreciates against the U.S. dollar mitigates the impact on our gross refining margins and product-to-feedstock margins of an appreciation of the Baht.

### **Critical Accounting Estimates and Judgments**

We have prepared our financial statements contained elsewhere in this Offering Memorandum in accordance with TFRS. Preparation of our financial statements requires our management to make estimates and judgments that affect the reported amount of our assets, liabilities, revenue and expenses, as well as the disclosure of our contingent assets and liabilities. Our management continually evaluates the estimates and judgments used in preparing the financial statements which are based on the management's historical experience and other factors, including the expectations of future events that are believed to be reasonable under the circumstances.

Our actual results may differ significantly under different assumptions or conditions. The accounting policies that we believe are the most critical to a full understanding and evaluation of our reported financial results are discussed below.

#### **Revenue**

Revenue excludes value added taxes and is arrived at after deducting trade discounts.

##### *Revenues from sale of goods and rendering of services*

Revenues from sale of goods is recognized when control of the goods is transferred to the customer, which is when the goods are delivered to the customer. Revenues from rendering of services is recognized as a performance obligation that is satisfied when the services underlying the particular performance obligation is transferred to the customer or is recognized over time based on the stage of completion of the contract.

##### *Investment income*

Investment income consists of dividend income, interest income from investments and bank deposits, and net gain or loss arising from financial assets or financial liability measured at fair value through profit or loss (FVTPL). Dividend income is recognized as profit or loss on the date our right to receive payments is established. Interest income is recognized on a time basis, based on the principal outstanding and the applicable interest rate.

##### *Other income*

Other income is recognized on an accrual basis.

#### **Foreign Currencies**

##### *Foreign currency transactions*

Transactions in foreign currencies are translated to our functional currency at the exchange rate on the date of the transaction.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate on the reporting date.

Non-monetary assets and liabilities measured at cost in foreign currencies are translated to the functional currency at the exchange rate on the date of the transaction.

Foreign currency differences arising on retranslation are generally recognized in profit or loss. However, foreign currency differences arising from the translation of qualifying cash flow hedges, to the extent that the hedges are effective, are recognized in other comprehensive income.

##### *Foreign operations*

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising in connection with the acquisition of foreign operations, are translated to Thai Baht at the exchange rates on the reporting date.

The revenues and expenses of foreign operations are translated to Thai Baht at the average rates during the year.

Foreign exchange differences are recognized in other comprehensive income and presented in the foreign currency translation reserve in equity until the disposal of the investment, except to extent that the translation difference is allocated to non-controlling interest.

### ***Income Tax***

Income tax expense for the year comprises current and deferred tax. Current and deferred tax are recognized in profit or loss except to the extent that they relate to the items recognized in equity in other comprehensive income.

Current tax is the expected tax payable or receivable on the taxable income for the year, using tax rates enacted at the end of the reporting period, and any adjustment to tax payable or receivable in respect of previous years.

Deferred tax is recognized when there are temporary differences between the carrying amounts and taxable value of assets and liabilities, and tax rates enacted or substantively enacted are applied to the temporary differences when they are reversed.

Deferred tax is not recognized for the following temporary differences:

- the initial recognition of goodwill and related transactions;
- the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss; and
- differences relating to investments in subsidiaries to the extent that they are unlikely to be reversed in the foreseeable future.

The measurement of deferred tax reflects the tax consequences that would follow the manner in which we expect to recover or settle the carrying amount of its assets and liabilities at the end of the reporting period.

In determining the amount of current and deferred tax, we take into account the impact of uncertain tax positions and whether additional taxes and interest may be due. We believe that our accruals for tax liabilities are adequate for all open tax years based on our assessment of many factors, including interpretations of tax law and prior experience. This assessment relies on estimates and assumptions and may involve a series of judgements about future events. New information may become available that causes the Group to change its judgement regarding the adequacy of existing tax liabilities; such changes to tax liabilities will impact tax expense in the period in which such a determination is made.

Deferred tax assets and liabilities on different tax entities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority.

A deferred tax asset is recognized to the extent that the deferred tax assets can likely be utilized as future tax benefit. Deferred tax assets are reviewed at each reporting date and reduced to the extent that the related tax benefit is unlikely to be realized.

### ***Intangible Assets***

#### ***Goodwill***

Goodwill that arises upon the acquisition of businesses is included in intangible assets. Subsequent to initial recognition, goodwill is measured at cost less accumulated impairment losses.

Goodwill in investment in joint ventures and associates is included in the carrying amount of the investment in joint ventures and associates, while impairment loss on such an investment is deducted directly from investment in joint ventures and associates.

### *Other intangible assets*

Other intangible assets that are acquired by us and have finite useful lives are measured at cost less accumulated amortization and accumulated impairment losses.

### *Subsequent expenditure*

Subsequent expenditure is capitalized only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, are recognized in statement of profit or loss as incurred.

### *Amortization*

Amortization is based on the cost of the asset less its residual value.

Amortization is recognized in profit or loss on a straight-line basis over the estimated useful lives of the intangible assets, other than goodwill and trademark, from the date that they are available for use, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. The estimated useful lives are as follows:

Production licence fees	10-30 years
Computer software	3-10 years
Right to use - others	3-16 years

Amortization methods, useful lives and residual values are reviewed at each financial year-end and adjusted as appropriate.

### ***Impairment***

The carrying amounts of our assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, the assets' recoverable amounts are estimated. In the case of goodwill and intangible assets that have indefinite useful lives or are not yet available for use, the recoverable amount is estimated each year at the same time.

An impairment loss is recognized if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. The impairment loss is recognized in profit or loss.

### *Calculation of recoverable amount*

The recoverable amount of a non-financial asset is the greater of the asset's value in use and fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For an asset that does not generate cash inflows largely independent of those from other assets, the recoverable amount is determined for the cash-generating unit to which the asset belongs.

### *Reversals of impairment*

An impairment loss in respect of goodwill is not reversed.

Impairment losses recognized in prior periods in respect of other non-financial assets are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

### ***Inventories***

Inventories are stated at the lower of cost and net realizable value.

Cost is calculated using the weighted average cost principle, and comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. In the case of

manufactured inventories and work-in-progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realizable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.

Provision is made for obsolete and slow-moving finished goods, factory supplies and spare parts based on the items that are obsolete and expected to be unsalable.

### ***Employee Benefits***

#### *Defined contribution plans*

Obligations for contributions to defined contribution plans are expensed as the related service is provided. The defined contribution plans comprise provident funds that we have established for our employees. Membership to the funds is on a voluntary basis. Contributions are made monthly by the employees at the minimum rate as required by law not exceeding 15% of their basic salaries and we contribute at the minimum rate as required by law, not exceeding 15% of the employees' basic salaries. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by a licensed fund manager.

#### *Defined benefit plans*

Our net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods and discounting that amount.

The calculation of defined benefit obligations is performed every 3 years by a qualified actuary using the projected unit credit method.

Remeasurements of the defined benefit liability, actuarial gain or loss are recognized immediately in other comprehensive income. We determine the interest expense on the defined benefit liability for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period. Interest expense and other expenses related to defined benefit plans are recognized in the statement of profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognized immediately in profit or loss. The Group recognizes gains and losses on the settlement of a defined benefit plan when the settlement occurs.

#### *Other long-term employee benefits*

Our net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognized in the statement of profit or loss in the period in which they arise.

#### *Termination benefits*

Termination benefits are expensed at the earlier of when we can no longer withdraw the offer of those benefits and when we recognize costs for a restructuring. If the benefits are not expected to be fully settled within 12 months of the end of the reporting period, they are discounted.

#### *Short-term employee benefits*

Short-term employee benefits are expensed as the related service is provided. A liability is recognized for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

### ***Derivatives***

Derivatives are used to manage exposure to foreign exchange, interest rates, and commodities arising from operating, financing and investing activities. Derivatives are not used for trading purposes. However, derivatives that do not qualify for hedging instruments are accounted for as trading instruments.

Derivatives are recognized initially at fair value; attributable transaction costs are recognized in the statement of profit or loss when incurred. Subsequent to initial recognition, they are remeasured at fair value. The gain or loss on remeasurement is recognized immediately in the statement of profit or loss.

The fair value of interest rate swaps is based on broker quotes at the reporting date. Those quotes are tested for reasonableness by discounting estimated future cash flows based on the terms and maturity of each contract, using market interest rates for a similar instrument at the reporting date.

The fair value of forward exchange contracts is based on their listed market price at the reporting date, if available. If the listed market price is not available, then fair value is estimated by forward contract with the same nature and maturity date at the reporting date.

## **Key Metrics by which We Measure Our Business**

### ***Key Metrics for Our Refinery Business Segment***

#### *Crude Distillation Rate*

Our crude distillation rate measures the utilization of our refinery and is the ratio of the crude oil feedstock input of our refinery against the refinery's total intake capacity of crude oil. Our crude distillation rate is impacted by the potential incremental profitability of additional production and the availability of our production facilities. Our crude distillation rate also takes into account shutdown time for scheduled and unscheduled maintenance, which includes the time necessary to gradually reduce production for the shutdowns and to recover to full production following the shutdowns. Our production is generally not subject to fluctuating demand and we generally seek to operate our refinery at its full capacity, as we sell most of our refined petroleum products from our refinery to PTT under long-term offtake agreements. As of December 31, 2020, 68.8% of our total sales revenue for our refinery products were derived from sales to PTT Group. Our crude distillation rates vary mainly due to periods of maintenance shutdowns.

Our crude distillation rate affects our operating expenses on a per barrel and per metric ton basis and our gross profit margin. Higher crude distillation rates of our refinery reduce the unit cost of production as we are able to spread our fixed operating expenses over a larger amount of crude oil, condensate residue and other feedstock intake.

Our refinery has a total intake capacity of 145,000 barrels of crude oil per day. The crude distillation rate of our refinery was 102%, 87% and 97% for the year ended December 31, 2018, 2019 and 2020, respectively. The increase in our crude distillation rate from the year ended December 31, 2019 to the year ended December 31, 2020 was due to a scheduled maintenance shutdown of refinery in 2019.

#### *Gross Refining Margin*

As revenues from, and costs of, our refining operations do not necessarily, when viewed individually, indicate our financial performance, we assess the profitability of our refinery by its gross refining margin. The gross refining margin for a given period is (i) the difference between the total revenue from the sale of our refinery products for such period and (ii) the total cost of our refinery feedstock, which includes costs of transportation and distribution of such feedstock and costs of energy used in operation, (iii) divided by the intake volume of crude and condensate residue for such period.

The average per barrel gross refining margins for our refinery were US\$6.08, US\$3.86 and US\$2.24 for the years ended December 31, 2018, 2019 and 2020, respectively.

#### Factors Affecting the Gross Refining Margin

Our gross refining margin has been and will continue to be affected by numerous factors, some of which are beyond our control.

- *Fluctuations in the price of crude oil and condensate residue.* The difference between the cost of the crude oil and condensate residue and the prevailing global prices for refined petroleum products is the primary factor that impacts our gross refining margins. Prices for crude oil and condensate residue are subject to frequent fluctuations depending on the prevailing global prices for crude oil and condensate residue. Therefore, even if the volume of crude oil and condensate residue we have purchased remains constant, our costs for production will vary significantly from time to time. In addition, the prices for

refined petroleum products are also subject to frequent and significant fluctuations. As a result, our revenue from refined petroleum products will vary from time to time even if our sale volume remains constant, resulting in corresponding variations in our gross refining margins. Prevailing global prices for crude oil and condensate residue may fluctuate in the same or different direction as the prevailing global prices for refined petroleum products.

- *Inventory accounting.* Our gross refining margins are affected by the way we account for cost of our inventory. We maintain an inventory of crude oil and refined petroleum products, which we account for at the lower of cost and net realizable value. Cost is calculated using the weighted average cost principle. Net realizable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.
- *Sale volumes.* Our gross refining margins are affected by our sale volumes, which are influenced by factors such as demand for our products and utilization for our production facilities.
- *Other factors.* Our gross refining margins are affected by other factors as well, including the configuration and performance of our refinery, fluctuations in foreign exchange rates, the type of feedstock used, our ability to purchase the optimal blend of crude oil, condensate residue and other feedstock, utilities and energy costs, transportation and distribution costs, freight losses and our ability to produce products that match customer demand.

### ***Product-to-Feedstock Market Price Spread***

We evaluate and monitor the profitability of refinery products by referring to the product-to-feedstock market price spreads, which are the differences between average market benchmark prices of key refinery products as measured against the market price of Dubai crude oil, employing such data to determine and manage our product mix.

The table below sets forth certain refinery product prices to Dubai crude oil price spreads for the years indicated.

	<b>For the year ended December 31,</b>		
	<b>2018</b>	<b>2019</b>	<b>2020</b>
	<b>(in US\$ per barrel)</b>		
<b>Product-to-feedstock market spread*</b>			
Gasoline price — Dubai crude oil price.....	10.53	8.96	4.43
Diesel price — Dubai crude oil price.....	14.63	13.70	6.14
Jet price — Dubai crude oil price .....	15.37	13.71	2.52
Fuel oil price — Dubai crude oil price.....	(2.67)	(4.91)	(3.02)

*Source: GC*

*\*Calculated by subtracting the average monthly feedstock benchmark price for that period from the average monthly product market benchmark price for the relevant period.*

### ***Key Metrics for Our Aromatics Business Segment***

#### ***BTX Utilization Rate***

Our benzene, toluene and xylene isomers (“**BTX**”) utilization rate is the measure of our aromatics plants’ utilization and is the ratio of our plants’ combined realized output of our BTX products, including benzene, paraxylene and cyclohexane, divided by their nameplate capacity. Our BTX utilization rate is impacted by the potential incremental profitability of additional production and the availability of our production facilities. Our BTX utilization rate also takes into account shutdown time for scheduled and unscheduled maintenance, which includes the time necessary to gradually reduce production for the shutdowns and to recover to full production following the shutdowns.

Our BTX utilization rate affects our operating expenses on a per metric ton basis and our gross profit margin. Higher BTX utilization rates of our aromatics units reduce the unit cost of production as we are able to spread our

fixed operating expenses over a larger amount of our BTX product output. As we sell most of our aromatics products to PTT and other domestic parties under long-term offtake agreements, our production is not subject to fluctuating demand and we generally seek to operate our aromatics plants at their full capacity. Our BTX distillation rates vary mainly due to periods of maintenance shutdowns.

Our aromatics units have an aggregate nameplate capacity of 2,419,000 metric tons of primary aromatics products per year. The BTX utilization rate of our aromatics units was 93%, 88% and 96%, for the years ended December 31, 2018, 2019 and 2020, respectively. The increase in our BTX utilization rate from the year ended December 31, 2019 to the year ended December 31, 2020 was due to the planned maintenance shutdown of one of our aromatics plant in May and June 2019 for 53 days.

#### *Product-to-Feedstock Margin*

As revenues from, and costs of, our aromatics production operations do not necessarily, when viewed individually, indicate our financial performance, we assess the profitability of our aromatics plants by their product-to-feedstock margin. The product-to-feedstock margin for a given period is (i) the difference between (a) the total revenue from the sale of BTX products and by-products for such period and (b) the total cost of our aromatics feedstock, which includes costs of transportation of such feedstock and costs of internally produced energy used in operation, (ii) divided by the total sale volume of BTX products for such period.

The average per BTX metric ton product-to-feedstock margins for our aromatics plants were US\$197, US\$130 and US\$130 for the years ended December 31, 2018, 2019 and 2020, respectively. The aromatics product-to-feedstock margin from the year ended December 31, 2019 to the year ended December 31, 2020 remained steady due to improved Benzene over Condensate spread and by-products spread, which offset the slight decrease in Paraxylene over Condensate spread. .

See “—*Product-to-Feedstock Market Price Spread*” below.

#### *Product-to-Feedstock Market Price Spread*

We evaluate and monitor the profitability of aromatics products by reference to the product-to-feedstock market price spreads, which are the differences between average market benchmark prices of key aromatics products as measured against the market price of condensate, employing such data to determine and manage our product mix.

The table below sets forth the prices of certain aromatics products to condensate price spreads for the periods indicated.

	<b>For the year ended December 31,</b>		
	<b>2018</b>	<b>2019</b>	<b>2020</b>
	<b>(in US\$ per barrel)</b>		
<b>Product-to-feedstock market spread*</b>			
Paraxylene (FECP) – Condensate.....	451	351	229
Benzene price (Spot Korea) – Condensate..	215	97	136

Source: GC

Notes:

\*Calculated by subtracting the average monthly feedstock benchmark price for that period from the average monthly product market benchmark price for the relevant period.

#### ***Key Metrics for Our Olefins, Polymer and EO-based Business Segments***

##### *Utilization Rate*

We measure the utilization of our olefins, polymer and EO-based performance products plants by their utilization rate, based on the ratio of the plants’ combined realized output, divided by their nameplate capacity. Our utilization rate is impacted by the demands of our customers for the products generated by our production units, the potential incremental profitability of additional production and the availability of our production facilities. Our utilization rate takes into account shutdown time for scheduled and unscheduled maintenance, including the time

necessary to gradually reduce production for the shutdowns and to recover to full production following the shutdowns. We generally seek to operate our olefins, polymer and EO-based product plants at their full capacity, subject to our assessment of customer demand for our products. In relation to our olefins plants, we seek to first maximize the utilization rates of our ethylene crackers to capitalize on the gas feedstock we receive at favorable pricing under our gas feedstock supply contracts with PTT, prior to maximizing the utilization rate of our naphtha cracker. Our utilization rates may also vary due to periods of maintenance shutdowns. Our utilization rate affects our operating expenses on a per metric ton basis and our gross profit margin. Higher utilization rates of our production units reduce the unit cost of production as we are able to spread our fixed operating expenses over a larger amount of feedstock intake.

Our olefins units have an aggregate nameplate capacity of 2,988,000 metric tons per year, comprising 2,376,000 metric tons per year of ethylene, 512,000 metric tons per year of propylene, 75,000 metric tons per year of butadiene and 25,000 metric tons per year of butene-1. Our polymers units have an aggregate nameplate capacity of 4,092,000 metric tons per year, which comprises 850,000 metric tons per year of HDPE, 800,000 metric tons per year of LLDPE, 300,000 metric tons per year of LDPE and 34,000 metric tons per year of hexene-1. In addition, we have joint ventures with nameplate capacities of 810,000 metric tons of polypropylene per year, 970,000 metric tons per year of PTA, 147,000 metric tons per year per PET, 90,000 metric tons per year of polystyrene, 61,000 metric tons per year of rotomolding compound and 30,000 metric tons per year of PP compound. Some of our polymers are produced and distributed by our joint ventures. The foregoing nameplate capacities and production volumes of our joint ventures reflects the total nameplate capacities and production volumes of those joint ventures. Meanwhile, our EO-based units have an aggregate nameplate capacity of 473,000 metric tons per year, which comprises 423,000 metric tons of MEG, and 50,000 metric tons per year of ethanolamines.

The table below sets forth the utilization rates of our olefins, MEG and polyethylene production units for the periods indicated.

	<b>Utilization Rate (%)</b>		
	<b>For the year ended December 31,</b>		
	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Product Unit</b>			
Olefins .....	101	102	97
MEG .....	100	97	95
Polyethylene .....	100	102	101

The decrease in our olefins plants average utilization rate from the year ended December 31, 2019 to the year ended December 31, 2020 was primarily due to planned maintenance shut down in 2020. The decrease in our MEG utilization rate from the year ended December 31, 2019 to the year ended December 31, 2020 was primarily due to the decreased production of olefins products. Our polyethylene utilization rate decreased from the year ended December 31, 2019 to the year ended December 31, 2020 due to higher planned maintenance shutdown in 2020 than in 2019.

*Product-to-Feedstock Market Price Spread*

We evaluate and monitor the profitability of olefins, polymer and EO-based performance products by referring to the product-to-feedstock market price spreads, which are the differences between average market benchmark prices of key olefins, polymer and EO-based performance products.

The table below sets forth the average spreads of certain olefins, polymer and EO-based product prices to Naphtha-MOPJ (other than MEG, which is measured against the price of 0.65 Ethylene) for the periods indicated.



	For the year ended December 31,		
	2018	2019	2020
	(in US\$ per barrel)		
<b>Product-to-feedstock market spread*</b>			
HDPE – Naphtha-MOPJ..	716	468	500
LLDPE – Naphtha-MOPJ	567	429	487
LDPE – Naphtha-MOPJ..	593	496	630
MEG – 0.65 Ethylene .....	367	219	164

Source: GC

\*Calculated by subtracting the average monthly feedstock benchmark price for that period from the average monthly product market benchmark price for the relevant period.

#### *Southeast Asia Spot Price of HDPE*

With respect to our olefins and polymer business segments, we monitor the Southeast Asia price of HDPE, as the pricing of feedstock under our natural gas feedstock supply contracts with PTT is calculated by reference to the Southeast Asia spot price of HDPE. Changes to the Southeast Asia spot price of HDPE therefore result in corresponding changes to the prices of our olefins and polymer feedstock. The Southeast Asia spot prices of HDPE were US\$1,330 per metric ton, US\$991 per metric ton and US\$880 per metric ton, for the years ended December 31, 2018, 2019 and 2020, respectively.

#### **Description of Certain Components of Our Results of Operations**

##### *Revenue from Sale of Goods and Rendering of Services*

Our revenue from sale of goods comprises revenue from sales of our refined petroleum products such as jet fuel, diesel and fuel oil from our refinery, sales of our aromatics products primarily comprising benzene, paraxylene and cyclohexanes, sales of our olefins products comprising ethylene, propylene and olefin by-products such as mixed C4, cracker bottom and tail gas, polymer products, and sales of our EO-based performance products, green chemicals and other specialty products. Our revenue from sale of goods also includes revenue from our generation and distribution of electricity, steam and industrial water to our customers located within the Map Ta Phut Industrial Complex.

Our sale prices for our refined petroleum products comprising revenue from sale of goods also include applicable excise taxes and oil fuel fund contribution charges, which are pass-through items, and are paid to the relevant Government authorities.

Our revenue from rendering of services comprises revenue from the operation of production support facilities, such as jetty and buffer tank farm services for plants in the Map Ta Phut Industrial Complex in Rayong, Thailand as well as revenue from the operation of our liquid chemical storage and transportation facilities and the provision of maintenance and engineering design services, safety, occupational health and environmental services and pipeline-related services.

Our service fees comprising our revenue from rendering of services exclude applicable taxes. The majority of our revenue from rendering of services is derived from our Services and Others business segment. However, our revenue may also be recorded under other business segments if such services are ancillary to their businesses, for example, revenue that is generated from the operation of the jetty linked to our refinery.

The following table sets forth the revenue and revenue contribution of our business segments as a percentage of our total revenue from sale of goods and rendering of services by business segment for the year ended December 31, 2020 before inter-segment eliminations.

Business segment	Revenue for year ended December 31,		Revenue contribution as
	2020		percentage of our
	THB	US\$	total revenue for
			year ended
			December 31, 2020
		(in millions)	%
Refinery .....	150,092.2	5,001.4	45.6%
Aromatics.....	76,994.9	2,565.6	23.4%
Olefins and Derivatives .....	115,787.0	3,858.3	35.2%
Green Chemicals* .....	18,202.5	606.5	5.5%
Performance Materials and Chemicals*.....	34,112.4	1,136.7	10.4%
Services and Others** .....	8,454.7	281.7	2.6%
Inter-segment Eliminations.....	(74,352.4)	(2,477.6)	(22.6)%
<b>Total.....</b>	<b>329,291.2</b>	<b>10,972.7</b>	<b>100.0%</b>

Notes:

\*A portion of our EO-based, green chemical and performance materials and chemicals products are produced and distributed by our joint venture partners. For further details, see “—Our Business Segments and Products—EO-Based Performance Products,” “—Our Business Segments and Products—Green Chemicals” and “—Our Business Segments and Products—Performance Materials and Chemicals.”

\*\* We operate a range of business services for our subsidiaries and associated companies and customers in the petrochemical industry and derive service fees from third party industrial customers. See “—Our Business Segments and Products—Services and Others” for further details.

### Cost of Sale of Goods and Rendering of Services

Our cost of sale of goods principally comprises (i) the cost of our raw materials such as crude oil and other feedstock, which includes excise and municipal taxes and oil fund contributions on domestic sales revenues for our refined petroleum products, and (ii) production expenses, which include internally produced fuels, purchased energy and other production expenses. Our other production expenses include depreciation of plant assets, utilities, direct labor costs and expenses in relation to shutdowns of our plants (other than major turnarounds). Expenses relating to major turnarounds of our plants are recorded as amortization expenses, which are also included in our cost of sale of goods. Our cost of sale of goods also includes losses on our feedstock inventories arising from fluctuations in feedstock prices.

Our cost of rendering of services comprises our operating costs in relation to our production support facilities such as jetty and buffer tank farm services for plants in the Map Ta Phut Industrial Complex as well as our operating costs in relation to the operation of our liquid chemical storage and transportation facilities and our provision of maintenance and engineering services, safety, occupational health and environmental services and pipeline-related services. These operating costs include labor and engineering and technical personnel costs, raw material and equipment costs and utilities expenses.

The following table sets forth the cost of sale of goods and rendering of services for each business segment as a percentage of our total cost of sale of goods and rendering of services by business segment for the year ended December 31, 2020 before inter-segment eliminations.

Business segment	Costs for year ended December 31,		Costs contribution
	2020		as percentage of
	THB	US\$	our total cost for
			year ended
			December 31,
		(in millions)	2020
			%
Refinery .....	154,007.2	5,131.9	51.6%
Aromatics.....	74,976.6	2,498.4	25.1%
Olefins and Derivatives .....	94,066.0	3,134.5	31.5%
Green Chemicals** .....	16,217.1	540.4	5.4%
Performance Materials and Chemicals*.....	26,255.8	874.9	8.8%
Services and Others** .....	6,065.5	202.1	2.0%
Inter-segment Eliminations.....	(73,302.5)	(2,442.6)	(24.6)%
<b>Total.....</b>	<b>298,285.6</b>	<b>9,939.5</b>	<b>100.0%</b>

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Notes:

\*A portion of our EO-based, green chemical and performance materials and chemicals products are produced and distributed by our joint venture partners. For further details, see “—Our Business Segments and Products—EO-Based Performance Products,” “—Our Business Segments and Products—Green Chemicals” and “—Our Business Segments and Products—Performance Materials and Chemicals.”

\*\* We operate a range of business services for our subsidiaries and associated companies and customers in the petrochemical industry and derive service fees from third party industrial customers. See “—Our Business Segments and Products—Services and Others” for further details.

### ***Investment Income***

Our investment income comprises dividend income from our equity investments in entities that are not our subsidiaries, associated companies or joint ventures, as well as interest income from our bank deposits and our loans to our associates.

### ***Other Income***

Our other income primarily comprises proceeds from our insurance claims, proceeds from our disposal of assets, sales of spare parts and proceeds from our tax rebates and other tax-related benefits.

### ***Gain on Bargain Purchase***

Our gain on bargain purchase comprises recognition of assets, liabilities and contingent liabilities acquired at fair value in relation to our acquisition of Siam Mitsui PTA Company Limited (renamed to GC-M PTA Company Limited) (“**GC-M PTA**”) and Thai PET Resin Company Limited (“**TPRC**”).

### ***Selling and Distribution Expenses***

Our selling and distribution expenses include our distribution, promotional, marketing expenses and our sales and marketing personnel expenses, which includes commissions paid to sales and marketing personnel. These expenses are generally tied to our sale levels.

### ***Administrative Expenses***

Our administrative expenses include our administrative and supporting personnel expenses, consultancy and professional fees, feasibility study expenses, depreciation and amortization as well as losses we incur from the disposal of our office and plant equipment below their purchase price. These expenses are relatively stable and generally not tied to our sale levels.

### ***Reversal of (Expenses from) Raw Materials Derogation***

In 2018, we recorded expenses from raw materials derogation as a result of the quantity of raw materials recorded in our systems being higher than the actual quantity stores at our suppliers’ facility due to misconduct among certain suppliers and employees. Upon receipt of the raw materials, we recorded a reversal of raw materials derogation.

### ***Loss from Impairment of Assets***

Our loss from impairment of assets comprises the loss we realized due to the change in operation plans for our subsidiary, PTTGC Innovation America Corporation, wherein the recoverable amount of our investment was less than its carrying amount. The recoverable amount was determined using the estimated future cash flows discounted to their present value.

### ***Net Derivative Gain / Loss***

Our derivative gain comprises gains from our financial derivatives, which include foreign exchange swaps, interest rate swaps and commodity forward contracts entered into for purposes of hedging our exposure to foreign exchange, interest rate and commodity price fluctuations. Our derivative loss comprises losses from our financial derivatives, which include foreign exchange swaps, interest rate swaps and commodity forward contracts entered into for purposes of hedging our exposure to foreign exchange, interest rate and commodity price fluctuations.

### *Net Gain / Loss on Foreign Exchange Rate*

Our net gain or loss on foreign exchange rate comprises both actual realized and unrealized gains or losses, as applicable, from sales and purchases made in foreign currencies, costs and expenses paid in foreign currencies, and payments of interest in foreign currencies, as well as gains or losses, as applicable, arising from the revaluation of our foreign currency assets and liabilities in line with fluctuations in exchange rates.

### *Finance Costs*

Our finance costs include interest and other financing expenses incurred under bank loans and other credit facilities and our Baht and U.S. dollar denominated bonds. Our finance costs exclude interest during construction accrued in relation to the financing of certain qualifying assets, comprising primarily of our plants, as such interest is capitalized under our statement of financial position in accordance with TFRS.

### *Share of Profit of Investments in Joint Ventures and Associates*

Our share of profit of equity-accounted investees comprises our share of profit or loss, as applicable, from our associates in proportion to our shareholding in such associates. Our share of profit from equity-accounted investees mainly derives from our investments in HMC, PTTAC, NatureWorks LLC (“NatureWorks”).

### **Results of Operations**

The following table provides a summary of our results of operations for the periods indicated.

	<b>For the year ended December 31,</b>			
	<b>2018</b>	<b>2019</b>	<b>2020</b>	
	<b>THB</b>	<b>THB</b>	<b>THB</b>	<b>US\$</b>
	(in millions)			
Revenue from sale of goods and rendering of services .....	518,654.7	412,810.3	329,291.2	10,972.7
Cost of sale of goods and rendering of services .....	(466,025.8)	(390,619.3)	(317,093.4)	(10,566.3)
<b>Gross profit .....</b>	<b>52,629.0</b>	<b>22,191.0</b>	<b>12,197.8</b>	<b>406.5</b>
Investment income.....	1,577.3	1,000.8	362.4	12.1
Other income .....	1,117.1	1,317.9	1,920.2	64.0
Gain on bargain purchases.....	1,354.9	31.5	—	—
Selling and distribution expenses.....	(3,405.8)	(3,931.4)	(3,687.1)	(122.9)
Administrative expenses .....	(11,448.5)	(12,537.3)	(11,194.1)	(373.0)
Reversal of (expenses from) raw materials derogation .....	(2,003.6)	232.5	—	—
Reversal of impairment losses on assets .....	—	—	312.7	10.4
Net derivative gain .....	122.0	1,498.8	1,168.9	38.9
Net gain (loss) on foreign exchange rate.....	13.1	1,755.5	(349.5)	(11.6)
Finance costs.....	(3,593.4)	(3,119.4)	(3,511.1)	(117.0)
Share of profit of investments in joint ventures .....	5,208.7	2,625.7	863.2	28.8
Share of profit of investments in associates.....	1,686.1	1,933.1	2,459.4	82.0
<b>Profit before income tax expense ...</b>	<b>43,256.9</b>	<b>12,998.7</b>	<b>542.6</b>	<b>18.1</b>
Income tax benefit (expense).....	(2,986.0)	(649.4)	109.3	3.6
<b>Profit for the year .....</b>	<b>40,271.0</b>	<b>12,349.3</b>	<b>651.9</b>	<b>21.7</b>
<b>Profit attributable to:</b>				
Owners of the Company .....	40,069.5	11,682.1	199.6	6.6

	For the year ended December 31,			
	2018	2019	2020	
	THB	THB	THB	US\$
	(in millions)			
Non-controlling interests .....	201.5	667.2	452.3	15.1
<b>Profit for the year .....</b>	<b>40,271.0</b>	<b>12,349.3</b>	<b>651.9</b>	<b>21.7</b>
<b>Basic earnings per share (Baht) .....</b>	<b>8.89</b>	<b>2.59</b>	<b>0.04</b>	<b>0.00</b>

### *Year ended December 31, 2020 Compared to Year ended December 31, 2019*

#### *Revenue from Sale of Goods and Rendering of Service*

Our revenue from the sale of goods and rendering of services decreased by THB83,519.1 million or 20.2% from THB412,810.3 million for the year ended December 31, 2019 to THB329,291.2 million (US\$10,972.7 million) for the year ended December 31, 2020. The decrease was primarily attributable to the decrease in average product prices and lower sales volume. Average product prices decreased as a result of the impact of the COVID-19 pandemic on demand, while our total sales volume decreased due to the planned maintenance shutdowns of our Aromatics unit, Olefins 2 unit and Phenol unit.

#### *Cost of Sale of Goods and Rendering of Services*

Our cost of sale of goods and rendering of services decreased by THB73,525.9 million or 18.8% from THB390,619.3 million for the year ended December 31, 2019 to THB317,093.4 million (US\$10,566.3 million) for the year ended December 31, 2020. The decrease was consistent with our lower sales volume in 2020, which was due to our planned maintenance shutdowns.

#### *Investment Income*

Our investment income decreased by THB638.4 million or 63.8% from THB1,000.8 million for the year ended December 31, 2019 to THB362.4 million (US\$12.1 million) for the year ended December 31, 2020. The decrease was primarily attributable to a decrease in interest income as a result of lower amounts of investments in debt securities through private funds.

#### *Other Income*

Our other income increased by THB602.3 million or 45.7% from THB1,317.9 million for the year ended December 31, 2019 to THB1,920.2 million (US\$64.0 million) for the year ended December 31, 2020. Other income is primarily comprised of rental, service fees and insurance claim.

#### *Gain on Bargain Purchases*

We did not have gain on bargain purchases in 2020. For the year ended December 31, 2019, gain on bargain purchase of THB31.5 million was primarily attributable to an adjustment to the fair value of assets acquired and liabilities assumed following the completion of an independent appraisal of our acquisition of GC-M PTA and of TPRC.

#### *Selling and Distribution Expenses*

Our selling and distribution expenses decreased by THB244.3 million or 6.2% from THB3,931.4 million for the year ended December 31, 2019 to THB3,687.1 million (US\$122.9 million) for the year ended December 31, 2020. The decrease was primarily attributable to decrease in sales volume as well as a decrease in marketing expenses.

#### *Administrative Expenses*

Our administrative expenses decreased by THB1,343.2 million or 10.7% from THB12,537.3 million for the year ended December 31, 2019 to THB11,194.1 million (US\$373.0 million) for the year ended December 31, 2020. The decrease was primarily attributable to decrease in personnel expenses due to measures taken to control the spread

of COVID-19 which limited personnel movement and travel as well as a decrease in depreciation of property, plant and equipment following the adoption of TFRS 16 in 2020.

#### *Reversal of Expenses from Raw Materials Derogation*

We did not have expenses from raw materials derogation in 2020. For the year ended December 31, 2019, reversal of expenses from raw materials derogation was THB232.5 million, which was primarily attributable to the gradual delivery of the outstanding raw materials to us from our suppliers, who also registered a mortgage on land with us.

#### *Reversal of Impairment Losses on Assets*

We had reversal of impairment loss on assets for the year ended December 31, 2020 of THB312.7 million. This was mainly from resuming one of the PTA production lines.

#### *Net Derivative Gain*

Our net derivative gain for the year ended December 31, 2020 was THB1,168.9 million (US\$38.9 million) compared to a net derivative gain of THB1,498.8 million for the year ended December 31, 2019. This was primarily attributable to a decrease in gains from commodity hedging.

#### *Net Gain (Loss) on Foreign Exchange Rate*

Our net gain on foreign exchange rate was THB1,755.5 million for the year ended December 31, 2019 compared to net loss on foreign exchange rate of THB349.5 million (US\$11.6 million) for the year ended December 31, 2020. This was primarily attributable to the steady appreciation of the Thai Baht against the US Dollar in 2020.

#### *Finance Costs*

Our finance costs increased by THB391.7 million or 12.6% from THB3,119.4 million for the year ended December 31, 2019 to THB3,511.1 million (US\$117.0 million) for the year ended December 31, 2020. The increase was primarily attributable to increased interest expense on increased debentures, loan and lease liabilities in 2020.

#### *Share of Profit of Investments in Joint Ventures*

Our share of profit from joint ventures for the year ended December 31, 2020 was THB863.2 million (US\$28.8 million) compared to THB2,625.7 million for the year ended December 31, 2019, a decrease of THB1,762.5 million or 67.1%. This decrease was primarily attributable to the decrease in revenues and income of our performance materials and chemicals joint venture, PTT Asahi Chemical Co., Ltd. and HMC Polymer Co., Ltd..

#### *Share of Profit of Investments in Associates*

Our share of profit from associates for the year ended December 31, 2020 was THB2,459.4 million (US\$82.0 million) compared to THB1,933.1 million for the year ended December 31, 2019, an increase of THB526.3 million or 27.2%. This increase was primarily attributable to an increase in our share of profit following capital injections into GPSC.

#### *Income Tax Benefit (Expense)*

Our income tax benefit for the year ended December 31, 2020 was THB109.3 million (US\$3.6 million) compared to income tax expense for year ended December 31, 2019 of THB649.4 million. The income tax benefit was primarily attributable to increase in deferred tax asset.

#### *Profit for the Year*

As a result of the foregoing, our profit for the year ended December 31, 2020 was THB651.9 million (US\$21.7 million) compared to our profit for the year ended December 31, 2019 of THB12,349.3 million, a decrease of THB11,697.4 million, or 94.7%.

## ***Year ended December 31, 2019 Compared to Year ended December 31, 2018***

### ***Revenue from Sale of Goods and Rendering of Service***

Our revenue from the sale of goods and rendering of services decreased by THB105,844.4 million or 20.4% from THB518,654.7 million for the year ended December 31, 2018 to THB412,810.3 million for the year ended December 31, 2019. The decrease was primarily attributable to the decrease in average product prices and lower sales volume. Average product prices decreased as a result of the impact of the US-China trade tension on the global economy, while our total sales volume decreased due to the planned maintenance shutdowns of our EO-based business, phenol unit, aromatics unit and refinery unit.

### ***Cost of Sale of Goods and Rendering of Services***

Our cost of sale of goods and rendering of services decreased by THB75,406.5 million or 16.2% from THB466,025.8 million for the year ended December 31, 2018 to THB390,619.3 million for the year ended December 31, 2019. The decrease was consistent with our lower sales volume in 2019, which was due to our planned maintenance shutdowns.

### ***Investment Income***

Our investment income decreased by THB576.5 million or 36.5% from THB1,577.3 million for the year ended December 31, 2018 to THB1,000.8 million for the year ended December 31, 2019. The decrease was primarily attributable to a decrease in interest income as a result of lower amounts of investments in debt securities through private funds.

### ***Other Income***

Our other income increased by THB200.8 million or 18.0% from THB1,117.1 million for the year ended December 31, 2018 to THB1,317.9 million for the year ended December 31, 2019. Other income is primarily comprised of export tax credit income, insurance claim, secondment income, sales of scrap and sales of write-off assets.

### ***Gain on Bargain Purchases***

Our gain on bargain purchases decreased by THB1,323.4 million or 97.7% from THB1,354.9 million for the year ended December 31, 2018 to THB31.5 million for the year ended December 31, 2019. The decrease was primarily attributable to our acquisition of GC-M PTA and TPRC in 2018.

### ***Selling and Distribution Expenses***

Our selling and distribution expenses increased by THB525.6 million or 15.4% from THB3,405.8 million for the year ended December 31, 2018 to THB3,931.4 million for the year ended December 31, 2019. The increase was primarily attributable to an increase in distribution expenses arising from our acquisition of GC-M PTA and TPRC in 2018.

### ***Administrative Expenses***

Our administrative expenses increased by THB1,088.8 million or 9.5% from THB11,448.5 million for the year ended December 31, 2018 to THB12,537.3 million for the year ended December 31, 2019. The increase was primarily attributable to expenses realized as a result of a new regulation regarding employee benefits under the Labor Protection Act.

### ***Reversal of (Expenses from) Raw Materials Derogation***

Our expenses from raw materials derogation for the year ended December 31, 2018 was THB2,003.6 million, compared to a reversal of raw materials derogation of THB232.5 million for the year ended December 31, 2019. The reversal of raw materials derogation was primarily attributable to the gradual delivery of the outstanding raw materials to us from our suppliers, who also registered a mortgage on land with us.

### *Net Derivative Gain*

Our net derivative gain for the year ended December 31, 2019 was THB1,498.8 million compared to a net derivative gain of THB122.0 million for the year ended December 31, 2018. This was primarily attributable to an increase in gains from commodity hedging.

### *Net Gain on Foreign Exchange Rate*

Our net gain on foreign exchange rate was THB13.1 million for the year ended December 31, 2018 compared to THB1,755.5 million for the year ended December 31, 2019. This was primarily attributable to a net gain on foreign exchange as the Baht appreciated against the U.S. dollar.

### *Finance Costs*

Our finance costs decreased by THB474.0 million or 13.2% from THB3,593.4 million for the year ended December 31, 2018 to THB3,119.4 million for the year ended December 31, 2019. The decrease was primarily attributable to our repayment of both loans from financial institutions and debentures in 2019.

### *Share of Profit of Investments in Joint Ventures*

Our share of profit from joint ventures for the year ended December 31, 2019 was THB2,625.7 million compared to THB5,208.7 million for the year ended December 31, 2018, a decrease of THB2,583.0 million or 49.6%. This decrease was primarily attributable to the softening performance of our petrochemical business.

### *Share of Profit of Investments in Associates*

Our share of profit from associates for the year ended December 31, 2019 was THB1,933.1 million compared to THB1,686.1 million for the year ended December 31, 2018, an increase of THB247.0 million or 14.6%. This increase was primarily attributable to an increase in our share of profit from capital injections into GPSC and the improved performance of VNT.

### *Income Tax Expense*

Our income tax expense for the year ended December 31, 2019 was THB649.4 million compared to income tax expense for year ended December 31, 2018 of THB2,986.0 million, a decrease of THB2,336.6 million or 78.3%. This decrease was primarily attributable to a decline in our taxable income.

### *Profit for the Year*

As a result of the foregoing, our profit for the year ended December 31, 2019 was THB12,349.3 million compared to our profit for the year ended December 31, 2018 of THB40,271.0 million, a decrease of THB27,921.7 million, or 69.3%.

## **Liquidity and Capital Resources**

Our primary sources of funding have historically been cash flows from operating activities, financing transactions with financial institutions and capital market bond offerings. Our principal uses of funds have been working capital, repayments of principal and interest on borrowings, capital expenditures, and payment of dividends to our shareholders. We believe that our future cash flows from operations, borrowing capacity and funds raised from our debt offerings will be sufficient to fund our planned capital expenditures and investments, debt maturities and working capital requirements through 2022. However, our ability to obtain adequate financing to satisfy these demands on liquidity may be limited by our financial condition and results of operations and the liquidity of international and domestic financial markets.



The following table sets forth our cash flows for period indicated.

	<b>For the year ended December 31,</b>			
	<b>2018</b>	<b>2019</b>	<b>2020</b>	
	<b>THB</b>	<b>THB</b>	<b>THB</b>	<b>US\$</b>
	(in millions)			
Net cash from operating activities	53,629.0	30,175.0	22,145.8	737.9
Net cash used in investing activities .....	(32,841.6)	(41,780.0)	(28,274.5)	(942.2)
Net cash provided by (used in) financing activities .....	(27,397.4)	(6,460.6)	31,793.8	1,059.4
Effect of exchange rate changes on cash and cash equivalents and effect from translation differences on financial statements .....	(75.4)	161.9	(192.4)	(6.4)
Cash and cash equivalents as at January 1 .....	43,429.4	36,744.0	18,840.3	627.8
Cash and cash equivalents as at December 31 .....	36,744.0	18,840.3	44,313.0	1,476.6

### ***Net Cash From Operating Activities***

Our net cash flows from operating activities includes cash generated from our operations and the sale of goods and services, realized foreign exchange gains and losses, actual administrative and selling expenses such as employee expenses and professional fees, and income tax expense.

Net cash flows provided by operating activities for the year ended December 31, 2020 amounted to THB22,145.8 million (US\$737.9 million). Our net cash before taxes was THB22,587.3 million (US\$752.7 million). Cash generated by operating income (after adding back non-cash items, share of profits of investments in joint ventures and associates (net of tax expense) and before charges for changes in operating assets and liabilities) was THB20,236.2 million (US\$674.3 million). Our finance costs amounted to THB3,511.1 million (US\$117.0 million) and we paid taxes of THB441.5 million (US\$14.7 million) for the year.

Net cash flows provided by operating activities for the year ended December 31, 2019 amounted to THB30,175.0 million. Our net cash before taxes was THB31,728.3 million. Cash generated by operating income (after adding back non-cash items, share of profits of investments in joint ventures and associates (net of tax expense) and before charges for changes in operating assets and liabilities) was THB27,335.6 million. Our finance costs amounted to THB3,119.4 million and we paid taxes of THB1,553.3 million for the year.

Net cash flows provided by operating activities for the year ended December 31, 2018 amounted to THB53,629.0 million. Our net cash before taxes was THB58,908.3 million. Cash generated by operating income (after adding back non-cash items, share of profits of investments in joint ventures and associates (net of tax expense) and before charges for changes in operating assets and liabilities) was THB59,681.5 million. Our finance costs amounted to THB3,593.4 million and we paid taxes of THB5,279.3 million for the year.

### ***Net Cash used in Investing Activities***

Our net cash flows used in investment activities include purchases of property, plant and equipment and other intangible assets as well as investments in expansion, reconfiguration and maintenance projects for our plants and facilities, equity investments and dispositions in businesses as well as loans to related parties.

Net cash flows used in investing activities for the year ended December 31, 2020 was THB28,274.5 million (US\$942.2 million). This primarily reflected acquisition of property, plant equipment and intangible assets of THB25,059.3 (US\$835.0 million) relating to the ORP project, the propylene oxide project in respect of GC Oxirane, and the polyols project in respect of GC Polyols and an increase of current investments in financial assets in debt instruments relating to deposits with financial institution.

Net cash flows used in investing activities for the year ended December 31, 2019 was THB41,780.0 million. This primarily reflected the acquisition of property, plant and equipment of THB39,827.7 million and the acquisition of investments in subsidiaries, joint ventures and associates of THB19,061.9 million in relation to expansion and reconfiguration projects and cash payment for the equity injection in GPSC.

Net cash flows used in investing activities was THB32,841.6 million for the year ended December 31, 2018. This primarily reflected the acquisition of property, plant and equipment and other non-current assets of THB27,760.6 million in relation to expansion and reconfiguration projects and for maintenance shutdowns, as well as the acquisition of investments in subsidiaries, joint ventures and associates of THB3,023.9 million in relation to the Asset Injection Project.

### ***Net Cash from (used in) Financing Activities***

Our net cash flows used in financing activities includes interest and dividends paid, finance lease payments and proceeds and payments under our long-term and short-term borrowings as well as dividend payments.

For the year ended December 31, 2020, net cash flows provided by financing activities was THB31,793.8 million (US\$1,059.4 million). The main component of this was proceeds from long-term borrowings from financial institutions of THB36,108.3 million (US\$1,203.2 million). This was offset in part with repayments of certain short-term loans and long term loans.

For the year ended December 31, 2019, net cash flows used in financing activities was THB6,460.6 million. The main component of this was dividends paid in the amount of THB16,336.3 million, long-term loans from financial institutions in the amount of THB16,083.9 million and finance costs of THB2,917.8 million. This was offset in part with proceeds from debentures of THB20,000.0 million and proceeds from long-term loans from financial institutions of THB13,237.3 million.

Net cash flows used in financing activities was THB27,397.4 million for the year ended December 31, 2018. The main component of this was dividends we paid amounting to THB19,739.1 million, our repayment of short-term loans from financial institutions of THB18,388.9 million, our repayment of long-term loans from financial institutions of THB18,069.1 million and our repayment of debentures of THB16,452.9 million. This was offset in part by proceeds from short-term loans from financial institutions of THB18,524.2 million, proceeds from debentures of THB16,371.2 million and proceeds from long-term loans from financial institutions of THB14,438.9 million.

### **Dividends**

It is the current policy of our Board of Directors to recommend to our shareholders a dividend of not less than 30% of net profit after tax after deduction of all specified reserves, subject to our investment plans, applicable laws, contingencies and other relevant considerations. The actual dividend payout ratio may vary above or below the level indicated in our dividend policy.

At the Board of Directors' Meeting held on February 15, 2021, the Board approved to propose to the Annual General Meeting of the shareholders the appropriation of annual dividend from 2020 performance at THB1.0 per share, amounting to THB4,486.5 million. The Company did not pay interim dividends in the first half of the year of 2020. The dividends shall be paid to the shareholders in April 2021.

At the Board of Directors' Meeting held on February 17, 2020, the Board approved to propose to the Annual General Meeting of the shareholders the appropriation of annual dividend from 2019 performance at THB2.00 per share, amounting to THB8,995 million. The Company had paid interim dividend of the first half year of 2019 at THB1.00 per share, amounting to THB 4,508 million on September 13, 2019. The remaining dividend will be paid for the second half year of 2019 at THB1.00 per share, amounting to THB4,487 million. The dividend shall be paid to the shareholders in April 2020.

At the Board of Directors' Meeting held on August 19, 2019, the Board approved the appropriation of interim dividends from the earnings from January 1, 2019 to June 30, 2019 at THB1.00 per share. The dividend amounting to THB4,508 million was paid to the rightful shareholders in September 2019.

At the Annual General Meeting of the shareholders held on April 5, 2019, the shareholders approved the appropriation of annual dividend from 2018 performance at THB4.25 per share, amounting to THB19,163 million. The Company had paid interim dividend of the first half year of 2018 at THB1.75 per share, amounting to THB 7,890 million on September 18, 2018. The remaining dividend was paid for the second half year of 2018 at THB2.50 per share, amounting to THB11,272 million. The dividend was paid to the shareholders in April 2019.

At the Board of Directors' Meeting held on August 20, 2018, the Board approved the appropriation of interim dividends from the earnings from January 1, 2018 to June 30, 2018 at THB1.75 per share. The dividend amounting to THB7,890 million was paid to the rightful shareholders in September 2018.

At the Annual General Meeting of the shareholders held on April 9, 2018, the shareholders approved the appropriation of annual dividend from 2017 performance at THB4.25 per share, amounting to THB19,087 million. The Company had paid interim dividend of the first half year of 2017 at THB1.75 per share, amounting to THB 7,815 million on September 18, 2017. The remaining dividend was paid for the second half year of 2017 at THB2.50 per share, amounting to THB11,272 million. The dividend was paid to the shareholders in April 2018.

### Capital Expenditure and Investment

Our capital expenditure and investment for the year ended December 31, 2020 was THB26,608.7 million (US\$886.7 million), which comprises our capital expenditures on the purchase of property, plants and equipment, the purchase of intangible assets, other non-current assets and investments in subsidiaries, joint ventures and associates.

We have a budgeted and committed capital expenditure and investment of THB18,486.2 million (US\$615 million) for the next three years. The following table sets forth our currently planned capital expenditures for 2021, 2022 and 2023. Actual future capital expenditures may differ materially from our planned capital expenditures and investment requirements set out below, and our board of directors may also approve additional capital expenditures and investment in future.

	<b>For the year ending December 31,</b>		
	<b>2021</b>	<b>2022</b>	<b>2023</b>
	<b>THB</b>	<b>(in millions) THB</b>	<b>THB</b>
Investment in relation to ENVICCO Limited (Recycled Plastics Project).....	750.3	-	-
Investment in relation to Kuraray GC Advanced Materials Co. Ltd (Super Engineering Plastic Project) .....	840.3	60.0	-
Investment in Olefins 2 Modification Project (“OMP Project”).....	1,440.5	2,730.9	570.2
Other projects and operating capital expenditures .....	6,122.0	3,301.1	2,670.9
<b>Total planned capital investments and investment requirements .....</b>	<b>9,153.1</b>	<b>6,092.0</b>	<b>3,241.1</b>

We plan to meet our capital expenditures requirements primarily from cash flow from operations and the net proceeds of existing debt facilities. We may also raise additional capital through the offering of equity, debt and other securities in the future. We may make additional capital investments as opportunities or needs arise. In addition, we may increase, reduce or suspend our planned capital expenditures for 2021 through 2023 or change the timing and use of our capital expenditures from what is currently planned in response to market conditions or for other reasons.

In addition, in the normal course of business, we will continue to explore and engage in ongoing evaluations and analyses of potential opportunities to expand and diversify our product offerings through greenfield investments and/ or mergers and acquisitions. All our investment projects must also meet our internal investment criteria of achieving our target return and be in alignment with our strategic objectives. We intend to finance our uncommitted capital expenditures through cash flow from operations and to fulfill additional financing needs through debt financing.

## Financing Arrangements and Other Contractual Obligations

### Indebtedness

The following table shows the outstanding amounts of our total consolidated short-term loans from financial institutions, long-term loans from financial institutions and from other parties, and amount of debentures for the periods indicated.

	As of December 31,			
	2018 THB	2019 THB	2020	
			THB	US\$
	(in millions)			
Short-term loans from financial institutions	3,343.1	2,021.0	19.0	0.6
Long-term loans from financial institutions	37,962.2	34,625.5	62,951.4	2,097.7
Long-term loans from other parties.....	1,251.7	309.5	294.0	9.8
Debentures .....	54,350.1	70,131.4	85,032.0	2,833.5
Lease liabilities	-	-	6,787.0	226.2
<b>Total Debt .....</b>	<b>96,907.1</b>	<b>107,087.4</b>	<b>155,083.4</b>	<b>5,167.7</b>

As of December 31, 2020, THB21,377.4 million (US\$712.3 million) of our total indebtedness of THB155,083.4 million (US\$5,167.7 million) was secured indebtedness. We have a conservative internal treasury policy that targets to maintain our indebtedness at levels such that our net debt (defined as total debt less cash and cash equivalents and current investments in financial assets, where total debt means the sum of short-term loans from financial institutions, short-term loans from related parties, current portion of long-term loans from financial institutions, current portion of debentures, subordinated loan, long-term loans from financial parties, debentures and lease liabilities) to equity ratio is less than 0.3 times and our net debt to Adjusted EBITDA ratio is less than 4.7 times.

As of December 31, 2020, our total Baht-denominated indebtedness amounted to THB111,436.3 million (US\$3,713.3 million) and our total foreign currency-denominated indebtedness amounted to THB36,860.1 million (US\$1,228.3 million). As of December 31, 2020, our total fixed rate indebtedness amounted to THB86,179.4 million (US\$2,871.7 million) and our total floating rate indebtedness amounted to THB62,177.0 million (US\$2,069.9 million).

See “Description of Other Material Indebtedness” for details regarding our short-term loans, long-term loans and outstanding debentures.

### Contractual Obligations

The following table provides a maturity analysis of our material contractual obligations as of December 31, 2020.

	Expected cash payments due by period			
	Total	Less than 1 year	After 1 but less than 5 years	More than 5 years
	THB	THB	THB	THB
	(in millions)			
<b>Contractual Obligations</b>				
Short-term borrowings from financial institutions.....	19.0	19.0	-	-
Long-term borrowings from financial institutions.....	62,951.4	1,974.4	42,777.9	18,199.1
Long-term borrowings from other parties .....	294.0	44.7	164.3	85.0
Debentures .....	85,032.0	19,997.5	41,559.5	23,475.0
Finance Leases .....	6,787.0	1,056.6	1,561.4	4,169.0

### ***Off Balance Sheet Arrangements***

We do not have any off-balance sheet arrangements that we believe have or are reasonably likely to have a current or future material effect on our financial condition, change in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources.

### **Taxation**

The prevailing corporate rate of income tax applicable to Thai companies generally is 20%. We enjoy certain investment promotion privileges from the BOI, which include certain tax privileges and exemptions. See “*Business—Investment Promotion*” for more details on our investment promotion privileges, including our tax privileges and exemptions.

Our effective tax rate for the year ended December 31, 2020 was 0.0%.

### **Inflation**

According to the Bank of Thailand, Thailand’s annual overall inflation rates for the years ended December 31, 2018, 2019 and 2020 were 1.1%, 0.7% and negative 0.4% respectively. We do not believe that inflation will have a material effect on our financial condition or results of operation.

### **Quantitative and Qualitative Disclosures Regarding Market Risks**

Our primary market risk exposures are to fluctuations in foreign exchange rates, the prices of commodities and interest rates.

#### ***Foreign Exchange Rate Risk***

We are exposed to both the transaction effects and translation effects of foreign currency exchange rate fluctuations between the U.S. dollar and the Baht.

Substantially all of our revenues and feedstock costs are denominated in U.S. dollars or are pegged in terms of U.S. dollars, while our fixed costs and administrative expenses are denominated in Baht. While the matching of revenue from our products and our feedstock costs in dollars or U.S. dollar-linked currencies provides a partial natural hedge, we are exposed to changes in the value of the U.S. dollar against the Baht. Depreciation in the value of the Baht against the U.S. dollar tends to have a beneficial effect on our gross refining margins and product-to-feedstock margins. Conversely, appreciation in the value of the Baht against the U.S. dollar tends to have a detrimental effect on our gross refining margins and product-to-feedstock margins. We also have outstanding foreign currency debt, and may incur and/or finance a substantial portion of our capital expenditures for future expansion programs in foreign currencies. Any depreciation in the Baht against the U.S. dollar would increase our finance costs.

We engage in hedging activities, including forward contracts and currency swaps, to manage exposure to fluctuations in foreign currencies on our financial results. We also incur U.S. dollar indebtedness to provide an indirect accounting hedge against the appreciation of the Baht against the U.S. dollar. The gain resulting from the translation of our U.S. dollar indebtedness into Baht as the Baht appreciates against the U.S. dollar mitigates the impact on our gross refining margins and product-to-feedstock margins of an appreciation of the Baht. Our hedging activities are designed to reduce, but do not eliminate, the effects of foreign currency fluctuations. Factors that could affect the effectiveness of our hedging activities include accuracy of sales forecasts, volatility of currency markets and the availability of hedging instruments.

See “*Risk Factors—Risks Relating to Thailand—Fluctuations in the value of the Baht could adversely affect demand for our products and our financial condition and results of operations.*”

#### ***Commodity Price Risk***

Substantially all of our products and raw materials are commodities whose prices are determined by reference to international market prices. International market prices are volatile and fluctuate based on market supply and demand conditions, and our profitability and product margins tend to fluctuate with changes in such prices.

We are exposed to risks associated with fluctuations in the prices of crude oil, as well as refined petroleum, olefins and aromatics and other petrochemical products. These fluctuations directly impact our revenues, cost of sales and our net profit. To manage this exposure, we generally acquire raw materials or sell finished products at

posted or market-related prices, which are typically set on a quarterly, monthly or more frequent basis in line with industry practice. See “*Risk Factors—Risks Relating to Our Business—Any significant fluctuation in price of the feedstock we purchase may substantially increase our production costs.*” We also attempt to manage our exposure to commodity price fluctuations by selling a diversified portfolio of petrochemical products. We have a high degree of integration in our operations which also assists us in managing the effect of such fluctuations.

### ***Interest Rate Risk***

We are exposed to interest rate risk resulting from fluctuations in interest rates on our short-term and long-term debt. Upwards fluctuations in interest rates increase the cost of new debt and the interest cost of outstanding floating rate borrowings. As of December 31, 2020, our total outstanding borrowings including bonds issued and excluding lease liabilities, totaled THB148,296.4 million (US\$4,941.6 million), of which THB62,177.0 million (US\$2,069.9 million) bore interest at variable rates. See “—*Financing Arrangements and Other Contractual Obligations—Indebtedness.*” Borrowings issued at variable rates expose us to cash flow interest rate risk. We monitor interest rates to assess the potential impact of changes in these rates on our financial position. For additional discussion of our market risks generally, see “*Risk Factors—Risks Relating to Our Business.*”

## INDUSTRY OVERVIEW

*Certain information and statistics presented in this Industry and Market Overview have been taken from independent market consulting firms including IHS Markit and other sources in the public domain. Some information is derived by us from the IHS Markit Materials, including multi-client studies of IHS Markit. IHS Markit Materials are based on its in-house database and publicly available data from industry organizations. IHS Markit has advised that (i) some information in its database is derived from estimates from industry sources or subjective judgments; (ii) the information in the database of other petrochemicals data collection agencies or other sources may differ from the information in IHS Markit's database; (iii) any data contained in IHS Markit studies or materials is based on data available at the time of collection and is subject to change from time to time where such changes may not be known to IHS Markit at the time of preparation of IHS Markit Materials; (iv) changes in factors upon which assumptions and the IHS Markit Materials are based affect conclusions that may be derived from the information contained in the IHS Markit Materials; (v) forecasts, forward looking statements, calculations based on assumptions and other public sources are inherently uncertain because of events or combinations of events that cannot reasonably be foreseen and (vi) the sources contained herein may not be accurate and should not be unduly relied upon. The information contained in IHS Markit Materials has been obtained from sources believed by IHS Markit to be reliable, and is unavoidably subject to certain assumptions and estimates made by third parties and such information has not been independently verified by IHS Markit. The information extracted from the IHS Markit Materials reflects an estimate of the market conditions at the time of preparation of the IHS Markit Materials. The information extracted from the IHS Markit Materials should not be viewed as a basis for investments provided by IHS Markit and references to the IHS Markit Materials should not be considered as IHS Markit's opinion as to the value of any security or the advisability of investing in the Notes. In no event will IHS Markit be liable for direct, indirect, special, punitive or consequential damages of any kind or nature whatsoever, suffered by the other party.*

*We do not have any confirmation that the information provided by these sources is inaccurate in any material respect. Neither us, any of our respective affiliates, advisors, nor the Arrangers and Dealers has independently verified the information included in this section. The information may not be consistent with other information within or outside Thailand.*

### Overview of The Industries in Which We Operate

The following is an overview of the industries in which we operate our primary business: Refinery, Aromatics, Olefins, Polymers, EO-Based Products, and Performance Materials and Chemicals.

#### Refinery

The refinery converts crude oil into refined products such as gasoline, distillates (diesel/gasoil), jet fuel, residual fuel oil, kerosene, and naphtha. Majority of refined products are used in transportation applications, followed by chemical intermediates.

#### Refinery – Global Supply & Demand (As of 2020)

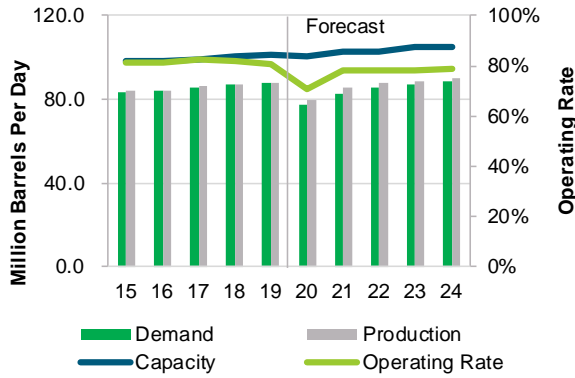
Over 2015-19, global refining capacity and demand have grown by 3.5 mbpd (0.8% AAGR) and 4.7 mbpd (1.4% AAGR) respectively. In 2019, global capacity and demand were at 101.5 mbpd and 87.7 mbpd respectively. In 2019, the top three producing regions were Asia Pacific (36.4% of global production), North America (22.7%), and Europe (15.9%), while the top three consuming regions were Asia Pacific (37.6% of global demand), North America (21.7%) and Europe (16.2%). Key net importers include South America, Asia Pacific and Africa, while key net exporters include CIS & Baltics, Middle East and North America. Over 2019-24, global capacity and demand are projected to grow by 3.8 mbpd (0.7% AAGR) and 1.1 mbpd (0.3% AAGR) respectively.

Over 2019-24, significant demand growth is projected in Asia Pacific, Middle east and Africa. Asia Pacific is projected to add 2.2 mbpd of demand, while the Middle East and Africa are projected to add 337 kbpd and 339 kbpd of demand respectively. Consequently, Asia Pacific is projected to add 2.4 mbpd of production, while the Middle East is projected to add 1.0 mbpd of production.

On a product basis, naphtha and gasoline are projected to have the highest demand increment at 764 kbpd (1.8% AAGR) and 302 kbpd (1.7% AAGR) between 2019 and 2024. In contrast, demand for residual fuel oil is projected to decline 430 kbpd (-1.6% AAGR) over the same period. This is mainly due to a global push towards cleaner fuels, and the introduction of the International Maritime Organization (“IMO”) requirement to reduce sulphur content in marine bunker fuel from a maximum of 3.5% to 0.5% which was effective from 1 January 2020. Upon introduction of the policy, some volumes of high sulphur residual fuel oil used in the maritime industry were substituted by gasoil, thus driving its demand.

Short to medium-term growth is expected to be severely impacted due to the COVID-19 induced recession. Global demand for refined products is estimated to fall by 10.3 mbpd in 2020 to 77.4 mbpd, with the hardest hit being gasoline and jet fuel at a drop of 3.5 mbpd and 3.2 mbpd respectively. Refined products are expected to see a limited rebound in 2021 with 2019 levels not expected to be restored until at least 2023.

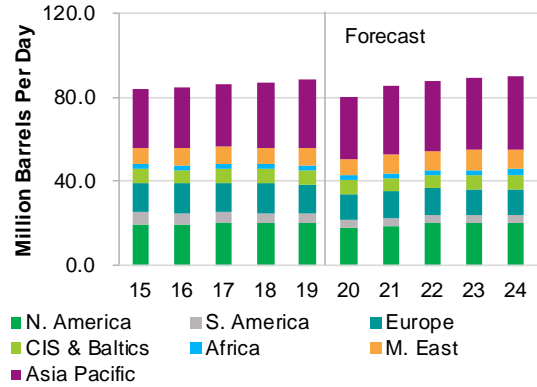
**World: Refined Products Supply & Demand**



Source: IHS Markit

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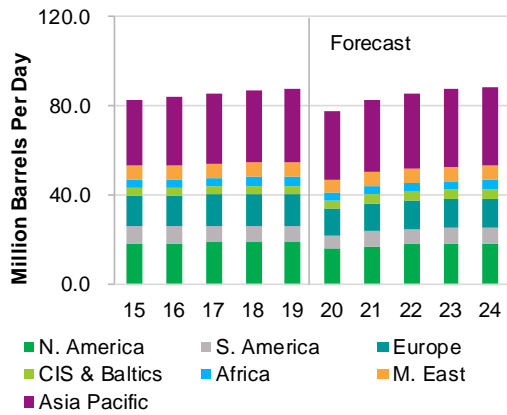
**World: Refined Products Production by Region**



Source: IHS Markit

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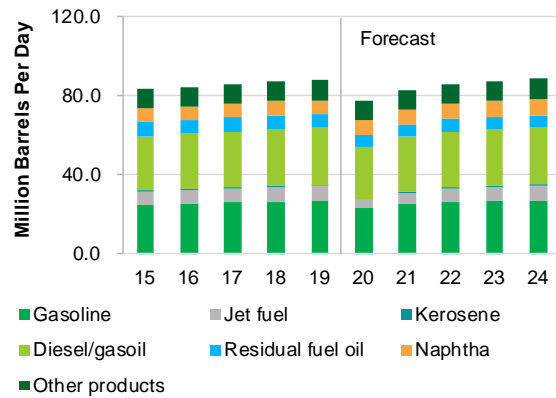
**World: Refined Products Demand by Region**



Source: IHS Markit

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**World: Refined Products Demand by Product**

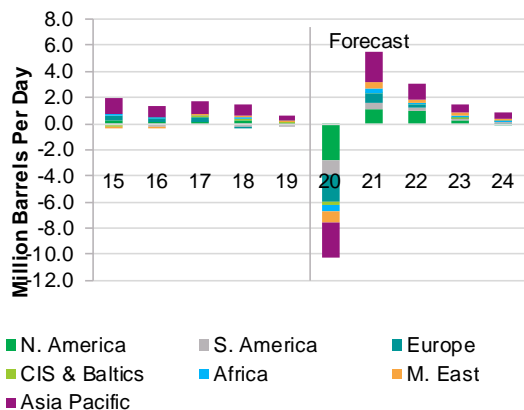


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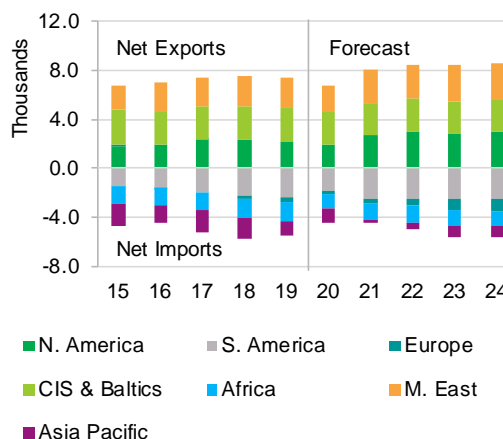
**World: Refined Products Demand Y-o-Y Growth**



Source: IHS Markit

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**World: Refined Products Net Trade**



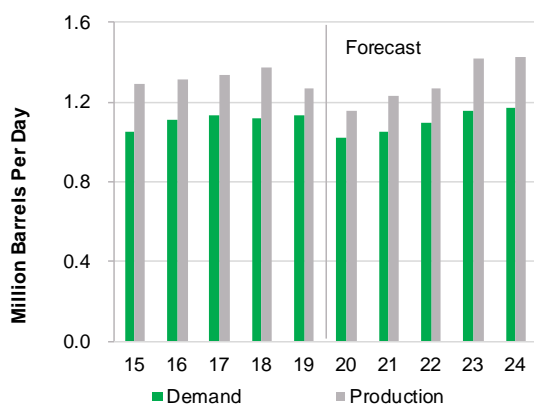
Source: IHS Markit

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**Refinery – Thailand Supply & Demand**

In 2019, Thailand production and demand were at 1.3 mbpd and 1.1 mbpd respectively. Over 2019-24, Thailand’s production is projected to grow by 152 kbpd (2.3% AAGR), while demand is projected to grow by 37 kbpd (0.6% AAGR). The country is a net exporter of refined products. Diesel, naphtha, and gasoline account for the bulk of refining production and products demand. The high production and demand of naphtha caters to Thailand’s well-established petrochemicals industry.

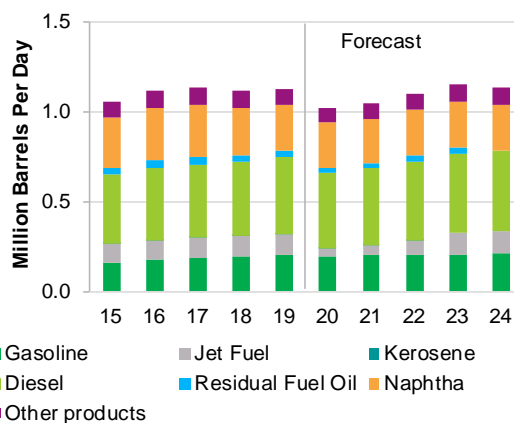
**Thailand: Refined Products Supply & Demand**



Source: IHS Markit

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**Thailand: Refined Products Demand by Product**



Source: IHS Markit

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**Aromatics**

**Paraxylene (As of 2021 World Analysis: Fall 2020 Update)**

Paraxylene is primarily used in the polyester chain for the production of purified terephthalic acid (“PTA”), which is used for the production of polyethylene terephthalate (“PET”). PET is subsequently used in the production of fibers, films, solid-state resins, and other consumables.

**Paraxylene – Global Supply & Demand**

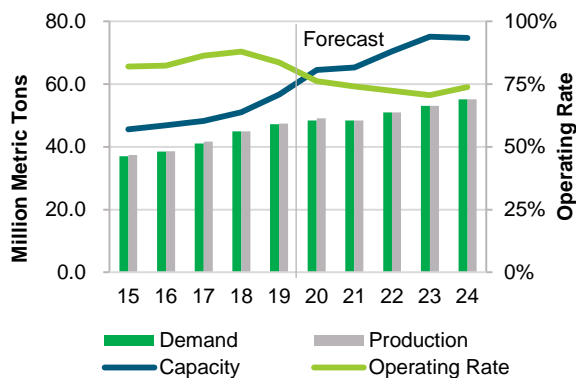
Despite the COVID-19 pandemic causing challenging economic conditions, paraxylene demand has held

up reasonably well as food packaging demand increased as consumers stocked up with more prepacked foods from grocery stores and supermarkets. Global paraxylene demand grew by an estimated 1.2 mtpa in 2020, which is driven by an inventory build in mainland China, where stored volume has risen to 1.5 mtpa, as the underlying polyester industry has actually shrunk in 2020 due to the COVID-19 effect on the economy. By 2024, mainland China is expected to add another 12 mtpa of capacity compared to 2020. The global merchant market is expected to decline over the forecast period, but the captive sector will grow.

Over 2014-19, global capacity and demand have grown by 11.3 mtpa (4.5% AAGR) and 12.1 mtpa (6.1% AAGR) respectively. In 2019, global capacity and demand were at 56.7 mtpa and 47.2 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (61.2% of global production), Southeast Asia (10.2%), Indian subcontinent (10.1%), and, while the top three consuming regions were Northeast Asia (73.1% of global demand), Indian subcontinent (7.9%), and Southeast Asia (6.3%). Key net importers include Northeast Asia, while key net exporters include the Middle East, and Southeast Asia. Over 2019-24, global capacity and demand are projected to grow by 18.1 mtpa (5.7% AAGR) and 7.9 mtpa (3.2% AAGR) respectively.

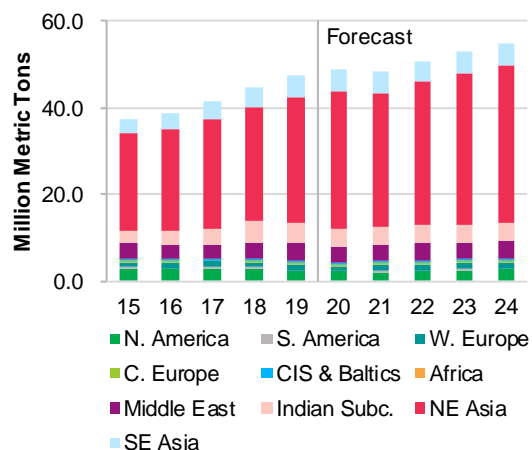
Paraxylene is mostly used for the production of PTA, which accounts for a bulk of global paraxylene demand. PTA is used for the production of polyester fiber and PET packaging resin, which are ultimately used in the consumer and packaging markets.

**World: Paraxylene Supply & Demand**



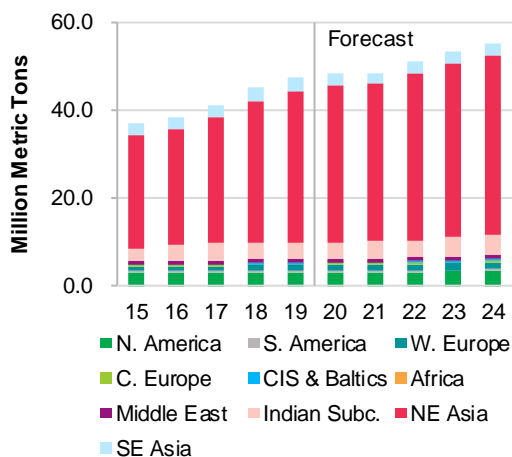
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**World: Paraxylene Production by Region**



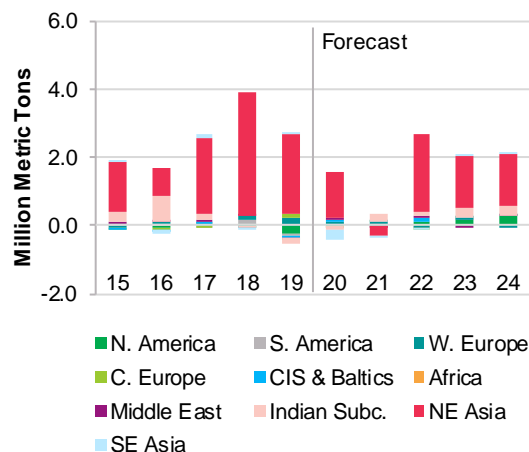
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**World: Paraxylene Demand by Region**



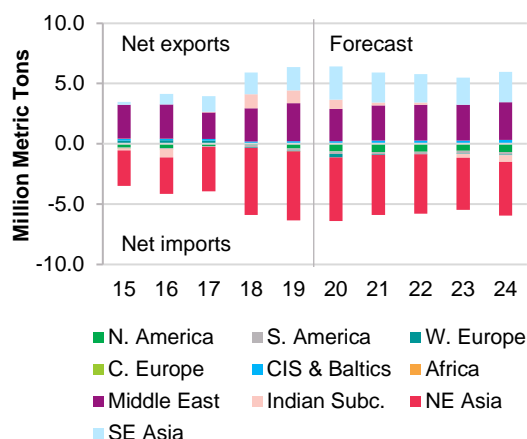
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**World: Paraxylene Demand Y-o-Y Growth**



Source: IHS Markit © 2020 IHS Markit

## World: Paraxylene Net Trade



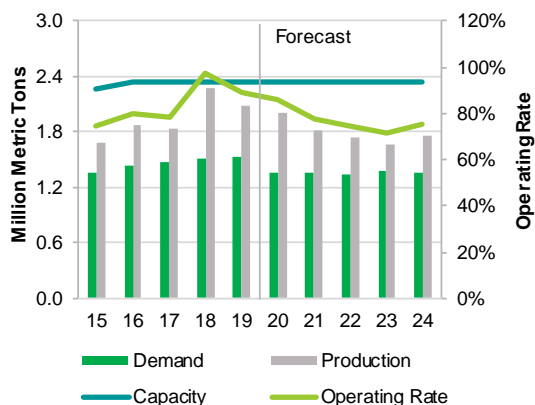
Source: IHS Markit

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### Paraxylene – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 2.1 mtpa and 1.5 mtpa respectively. The country has a total of 2.3 mtpa of capacity, and this is forecasted remain unchanged through 2024. Operating rates are projected to improve to an average of 79% over 2019-24.

## Thailand: Paraxylene Supply & Demand



Source: IHS Markit

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### Benzene (As of 2021 World Analysis: Fall 2020 Update)

Benzene is an aromatic hydrocarbon, and one of the primary chemical building blocks for the petrochemical industry. Intermediate chemicals produced using benzene are used to produce a myriad of end-use products, including packaging containers, plastics components, fibers, tires, hoses, etc. Benzene is primarily produced as a by-product of refinery, naphtha cracker, and paraxylene operations, which together account for about 92% of global benzene production. Benzene can also be produced from coal. Since benzene is produced primarily as a by-product, benzene capacity is mostly feed-limited, and thus operating rates are less important a parameter than for other commodity chemicals.

### Benzene – Global Supply & Demand

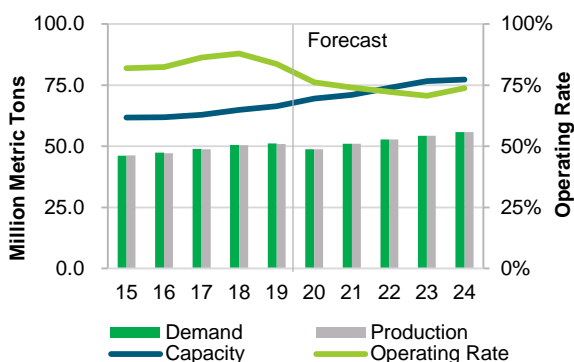
Due to the COVID-19 pandemic, production volume in 2020 is estimated to be lower than in 2019 at 48.8 mtpa, and operating rate is estimated to be 70%, which is lower than 2019's 77%.

Over 2014-19, global capacity and demand have grown by 5.0 mtpa (1.6% AAGR) and 6.2 mtpa (2.6% AAGR) respectively. In 2019, global capacity and demand were at 66.4 mtpa and 51.2 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (52.5% of global production), North America (12.8%), and West Europe (11.8%), while the top three consuming regions were Northeast Asia (51.6 % of global demand), North America (16.1%), and West Europe (14.2%). Key net importers include North America and West Europe, while key net exporters include the Indian subcontinent and Southeast Asia. Over 2019-24, global capacity and demand are projected to grow by 10.9 mtpa (3.1% AAGR) and 4.5 mtpa (1.7% AAGR) respectively.

In Northeast Asia, significant refinery, naphtha cracker, and paraxylene capacities have been added over the last decade, driving the by-production of benzene. However, the rate of capacity additions is expected to slow going forward due to lower growth expectations for China and an associated slowdown in the commissioning of new refineries, coke ovens, and steam crackers. Despite this, Northeast Asia will continue to have the highest additions for benzene capacity over the next five years. On the other hand, the historically industrialized regions of West Europe, the U.S., and Japan have seen their capacity broadly decline over the past decade in response to global supply shifts. The decommissioning of less efficient and older plants, as well as the restructuring of refining and cracking complexes has led to lower benzene production in these regions.

North America is expected to remain the largest net importer, while Northeast Asia's position as a net exporter will shift to net importer led by China. Demand for benzene will continue to come from the production of other intermediate chemicals including ethylbenzene / styrene, cumene / phenol, cyclohexane, and nitrobenzene / aniline, which accounted for over 90% of global benzene consumed in 2020. Underlying growth for all main benzene derivatives is expected to remain.

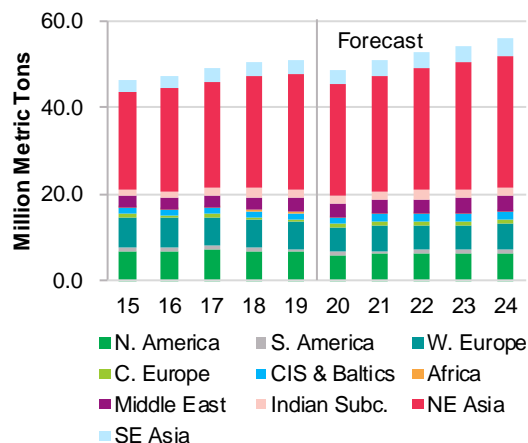
**World: Benzene Supply & Demand**



Source: IHS Markit

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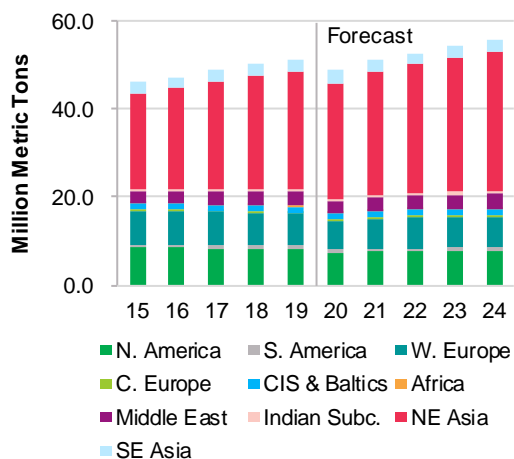
**World: Benzene Production by Region**



Source: IHS Markit

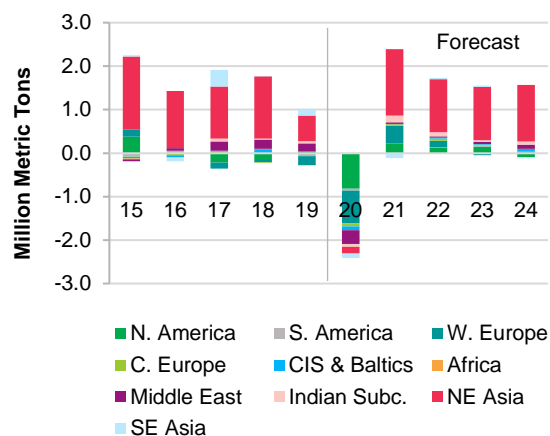
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### World: Benzene Demand by Region



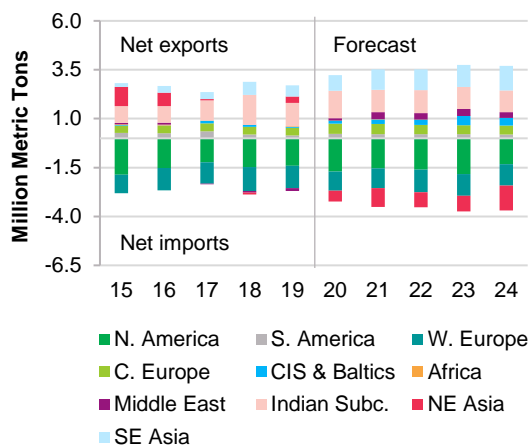
Source: IHS Markit © 2020 IHS Markit

### World: Benzene Demand Y-o-Y Growth



Source: IHS Markit © 2020 IHS Markit

### World: Benzene Net Trade

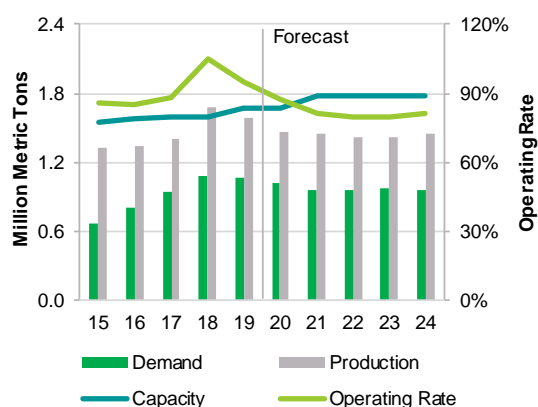


Source: IHS Markit © 2020 IHS Markit

### Benzene – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 1.6 mtpa and 1.1 mtpa respectively. The country has a total of 1.7 mtpa of capacity, and this is forecasted to increase to 1.8 mtpa in 2021. Operating rates are projected to average 84% over 2019-24. Forward operating rates are projected to be lower than historical average due to new refinery, naphtha cracker, and paraxylene capacities projected to come online in Southeast Asia. Thailand has been a major benzene exporter in Southeast Asia, with benzene export volumes increasing after PTTGC's new reformer and toluene transalkylation plant came online.

### Thailand: Benzene Supply & Demand



Source: IHS Markit © 2020 IHS Markit

## Olefins

### Ethylene (As of 2021 World Analysis: Fall 2020 Update )

Ethylene is produced primarily by the steam cracking of hydrocarbons (naphtha, ethane, gasoil, LPG). It is used as a feedstock in the manufacture of plastics, fibers, and other organic chemicals that are ultimately consumed in the packaging, transportation, and construction industries, as well as a multitude of industrial and consumer markets. Because of the diverse portfolio of end uses, ethylene consumption is sensitive to both economic and energy cycles. As such, ethylene demand growth is broadly tied to GDP growth.

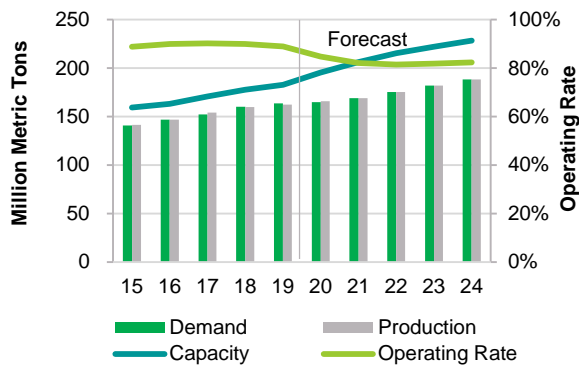
#### Ethylene – Global Supply & Demand

Because of COVID-19, 2020 is deemed as a lost year of demand growth for ethylene derivatives. Nondurable sectors fared better than durable goods in supporting a small level of demand growth, but the growth included elements of stocking and restocking of different value chains. Ethylene demand is expected to continue at a strong pace globally after the 2020-21 GDP recovery window.

Over 2015-19, global capacity and demand have grown by 23.4 mtpa (3.5% AAGR) and 22.7 mtpa (3.8% AAGR) respectively. In 2019, global capacity and demand were at 182.8 mtpa and 163.6 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (27.5% of global production), North America (24.0%), and the Middle East (18.7%), while the top three consuming regions were Northeast Asia (28.0% of global demand), North America (23.3%), and the Middle East (18.5%). Key net importers include Northeast Asia, while key net exporters include the Middle East, and North America. Over 2019-24, global capacity and demand are projected to grow by 45.6 mtpa (4.6% AAGR) and 24.6 mtpa (2.8% AAGR) respectively.

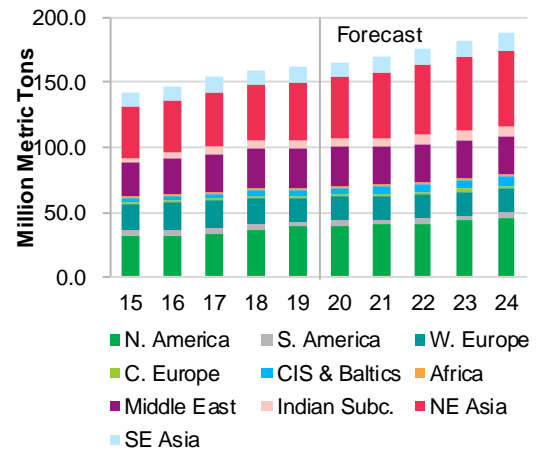
Global ethylene demand growth is projected to outpace that of global GDP growth. The demand will be driven by production of HDPE, LDPE and LLDPE, which accounted for over 60% of the demand in 2019 and projected to remain till 2024. Global capacity additions are expected to outpace demand growth with Northeast Asia and North America as the key growth regions over the next five years. In North America, the favorable low cost position has led various capacity additions announcement. The region is expected to grow its capacity by 9.7 mtpa with operating rates expected to stay at an average of 84% across 2019-24.

**World: Ethylene Supply & Demand**



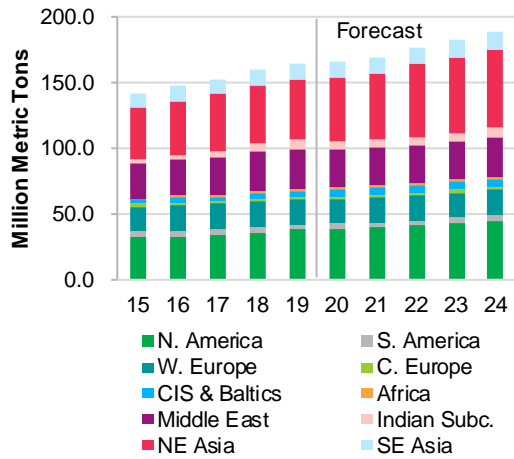
Source: IHS Markit © 2020 IHS Markit

**World: Ethylene Production by Region**



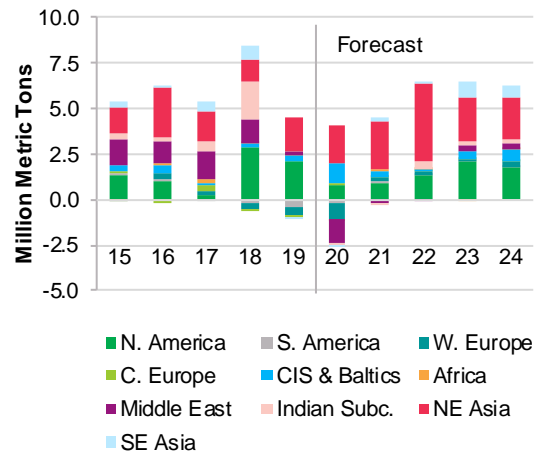
Source: IHS Markit © 2020 IHS Markit

**World: Ethylene Demand by Region**



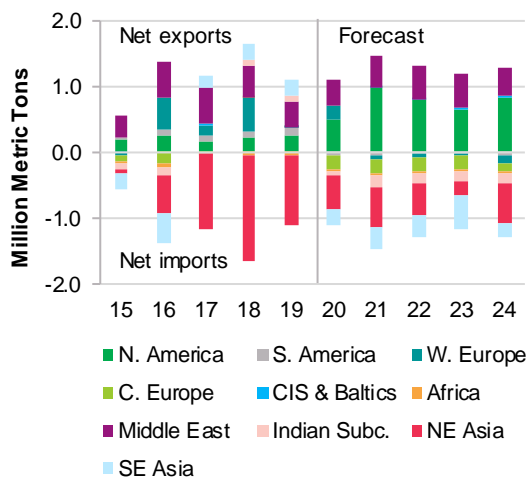
Source: IHS Markit © 2020 IHS Markit

**World: Ethylene Demand Y-o-Y Growth**



Source: IHS Markit © 2020 IHS Markit

## World: Ethylene Net Trade

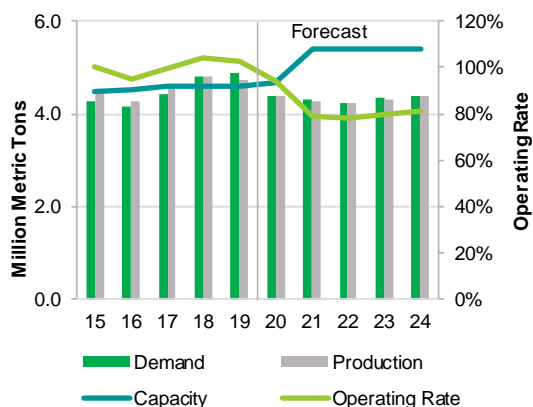


Source: IHS Markit © 2020 IHS Markit

### Ethylene – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 4.7 mtpa and 4.7 mtpa respectively. Thailand has a total capacity of 4.6 mtpa and this is forecasted to increase to 5.4 mtpa in 2021. Operating rates are projected to average 86% over 2019-24, slightly lower than historical average due to capacity additions in 2021.

## Thailand: Ethylene Supply & Demand



Source: IHS Markit © 2020 IHS Markit

### Propylene (As of 2021 World Analysis: Fall 2020 Update )

Propylene is an important raw material for the production of chemicals such as polypropylene, acrylonitrile, propylene oxide, oxo alcohols, as well as for a large variety of industrial products. Propylene has historically been produced as a by-product from production of ethylene through steam cracking of naphtha, gasoil, and LPG feedstocks, and also as a by-product from refining operations. However, with the increasing production of ethylene using ethane feedstock in North America, and the resulting lack of propylene's by-production, there is an increasing trend of on-purpose production of propylene in recent years.

### Propylene – Global Supply & Demand

Despite the COVID-19 pandemic, the demand outlook has changed minimally as consumption is poised to rebound in 2021 with the overall growth expected to be 3.3% p.a. during 2019-24. The impact on the supply side is expected to be more prominent, as the decline in transport fuel demand affected supply of upstream oil and gas,



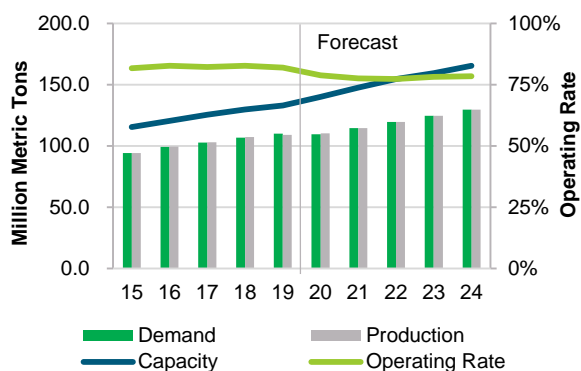
which consequently has a detrimental impact on refinery-grade propylene and natural gas liquids supply.

Over 2014-19, global capacity and demand have grown by 24.5 mtpa (4.1% AAGR) and 21.3 mtpa (4.4% AAGR) respectively. In 2019, global capacity and demand were at 133.1 mtpa and 110.1 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (47.2% of global production), North America (12.7%), and West Europe (11.1%), while the top three consuming regions were Northeast Asia (47.0% of global demand), North America (12.4%), and West Europe (12.2%). Over 2019-24, global capacity and demand are projected to grow by 32.2 mtpa (4.4% AAGR) and 19.6 mtpa (3.3% AAGR) respectively. Northeast Asia will be the key growth region for both capacity and demand over the next five years.

Over the past decade, several on-purpose technologies have been developed, primarily to fill the supply gap left by a growing share of ethane feedstock cracking, which typically yields less propylene by-product. On-purpose production accounted for 27% of propylene supply in 2019, and is projected to grow to 33% by 2024.

Global propylene demand remains strong and is heavily dominated by the production of polypropylene, which is expected to account for nearly 70% of global demand by 2025. Other major uses include acrylonitrile, propylene oxide, cumene, and acrylic acid. Propylene is ultimately used in the production of a range of durable goods, packaging, and construction materials. As such, propylene’s demand is broadly tied to the general economy. Propylene trade is limited globally because of the associated high cost of transportation. It is more typically shipped in the form of derivatives, such as polypropylene and acrylonitrile.

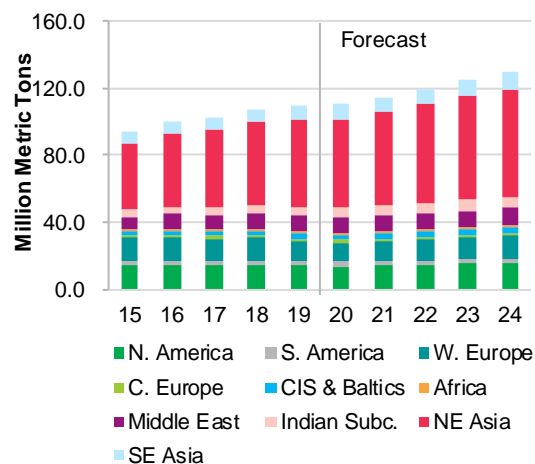
**World: Propylene Supply & Demand**



Source: IHS Markit

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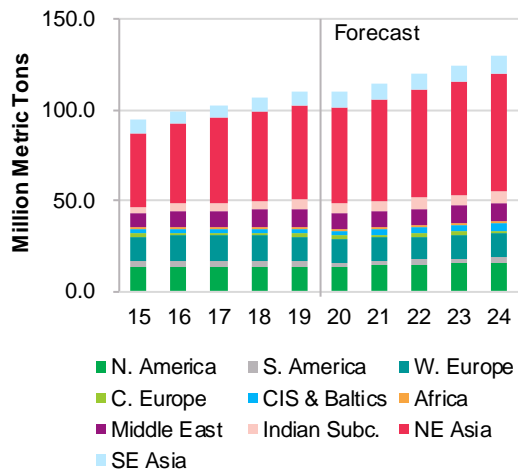
**World: Propylene Production by Region**



Source: IHS Markit

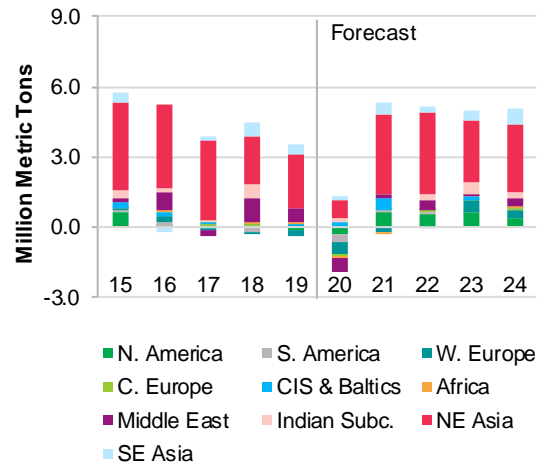
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### World: Propylene Demand by Region



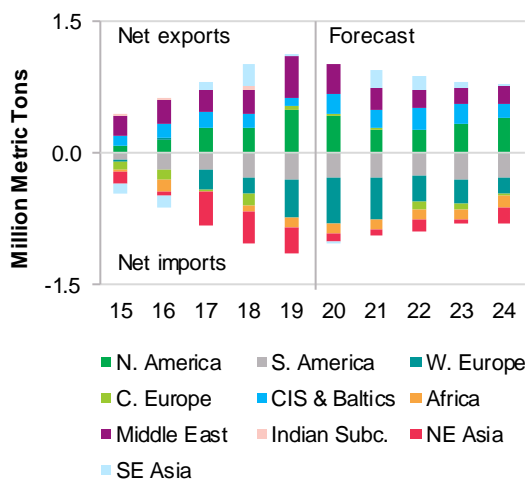
Source: IHS Markit © 2020 IHS Markit

### World: Propylene Demand Y-o-Y Growth



Source: IHS Markit © 2020 IHS Markit

### World: Propylene Net Trade

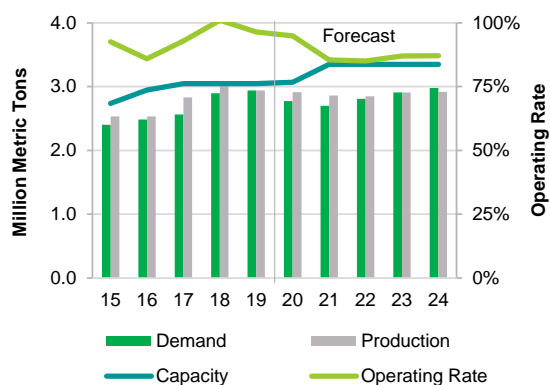


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### Propylene – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 2.9 mtpa and 2.9 mtpa respectively. Thailand has a total of 3.0 mtpa capacity and this is forecasted to increase to 3.3 mtpa by 2021. Operating rates are projected to improve to an average of 89% over 2019-24.

### Thailand: Propylene Supply & Demand



Source: IHS Markit

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### Butadiene (As of 2021 World Analysis: Fall 2020 Update )

Butadiene is a key raw material used for the production of chemicals such as polybutadiene elastomers, styrene-butadiene rubber, adiponitrile, and acrylonitrile-butadiene-styrene (“ABS”) resins, as well as for a large variety of other industrial products. Butadiene is primarily produced as a by-product from steam cracking, which accounts for about 96% of supply source.

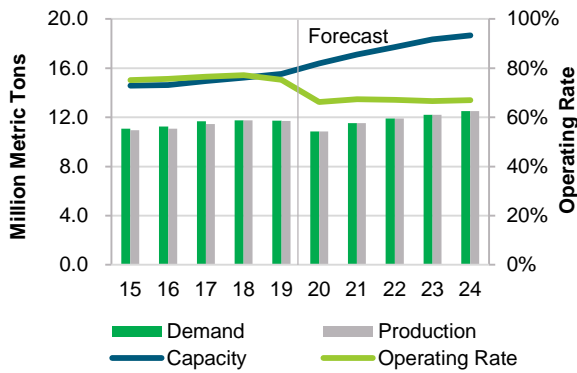
#### Butadiene – Global Supply & Demand

The markets have been disrupted by the COVID-19 impact, but a return to growth is expected. Global butadiene demand is estimated to fall by roughly 8% in 2020, but the demand destruction is not geographically uniform – demand in mainland China is expected to be nearly the same as it was in 2019 while demand in North America will fall by nearly 15%. Global butadiene demand is heavily dominated by the production of synthetic rubber, which accounted for more than 60% of the overall market in 2019 and is expected to grow at 1.0% during 2019-24. Butadiene is used primarily in durable goods such as tires, furniture, construction materials, etc.

Over 2014-19, global capacity and demand have grown by 1.3 mtpa (1.8% AAGR) and 1.0 mtpa (1.8% AAGR) respectively. In 2019, global capacity and demand were at 15.5 mtpa and 11.7 mtpa respectively. In 2020, the top three producing regions were Northeast Asia (47.4% of global production), West Europe (17.5%), and North America (12.4%), while the top three consuming regions were Northeast Asia (51.5% of global demand), West Europe (15.1%), and North America (14.7%). Key net importers include Northeast Asia and North America, while key net exporters include West Europe and South America. Over 2019-24, global capacity and demand are projected to grow by 3.1 mtpa (3.7% AAGR) and 0.8 mtpa (1.3% AAGR) respectively.

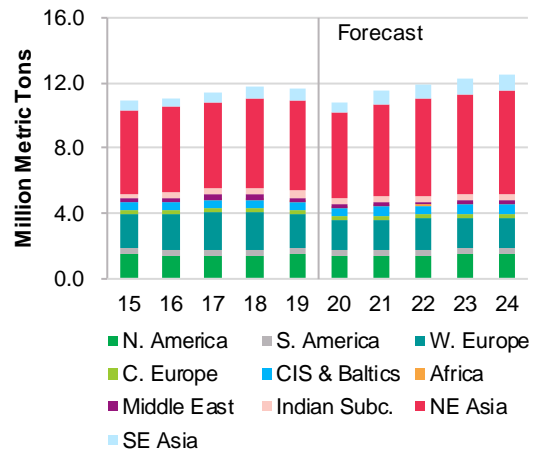
Roughly 96% of global butadiene supply is produced from the by-production of steam cracking operations. As such, global supply of butadiene is ultimately a function of cracker production levels, and feedstock selection. Cracking of heavier feedstocks such as naphtha and gasoil yields a higher proportion of butadiene, versus ethane feedstocks. Despite some on-purpose production technologies available, these production levels are rather insignificant.

**World: Butadiene Supply & Demand**



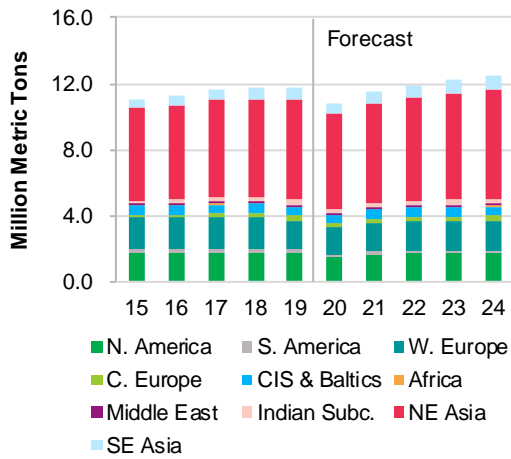
Source: IHS Markit © 2020 IHS Market

**World: Butadiene Production by Region**



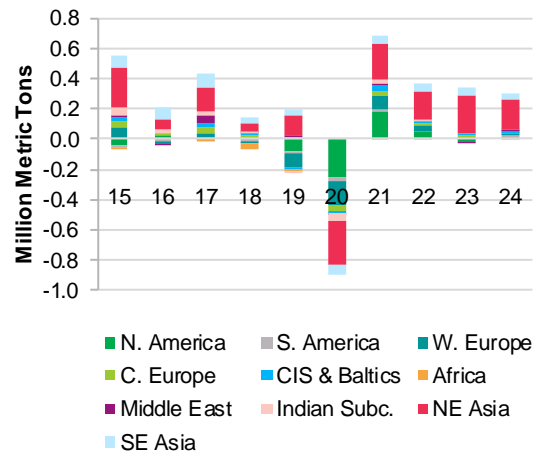
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**World: Butadiene Demand by Region**



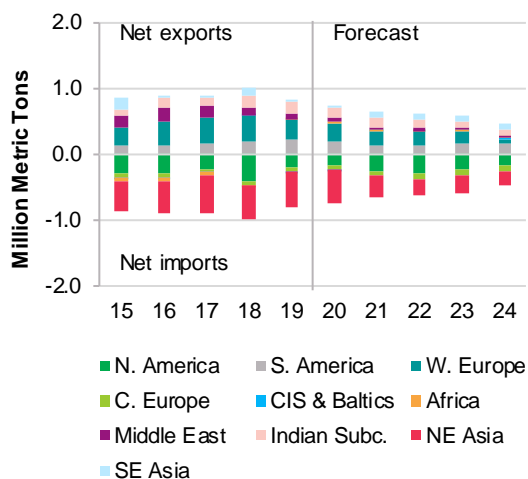
Source: IHS Markit © 2020 IHS Market

**World: Butadiene Demand Y-o-Y Growth**



Source: IHS Markit © 2020 IHS Market

## World: Butadiene Net Trade



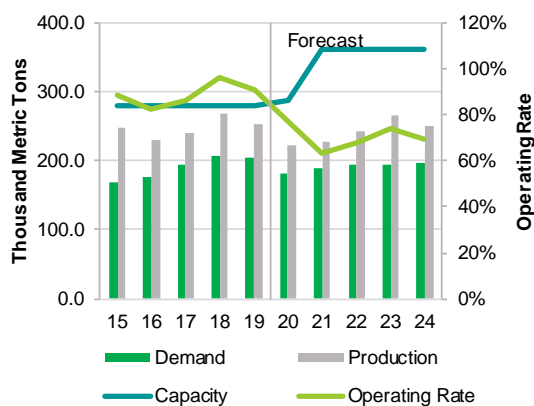
Source: IHS Markit

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## Butadiene – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 253 ktpa and 205 ktpa respectively. Thailand has a total of 280 ktpa capacity which is forecasted to increase to 360 ktpa in 2021. Operating rates are projected to average 73% over 2019-24.

## Thailand: Butadiene Supply & Demand



Source: IHS Markit

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## Polymers

### Polyethylene (As of 2021 World Analysis: Fall 2020 Update)

Polyethylene is the most widely used plastic globally and is produced in three different forms – high density polyethylene (“HDPE”), low density polyethylene (“LDPE”), and linear low-density polyethylene (“LLDPE”), each of which have different properties, giving it a wide range of applications. HDPE/LLDPE swing plants are capable of producing HDPE and LLDPE within the same facilities, while LDPE is usually based on dedicated production lines. Polyethylene accounts for about 37% of the global thermoplastics market, and is used in a wide range of molded and extruded applications, including food and beverage containers, toys, plastic bags, pipe, pails, etc.

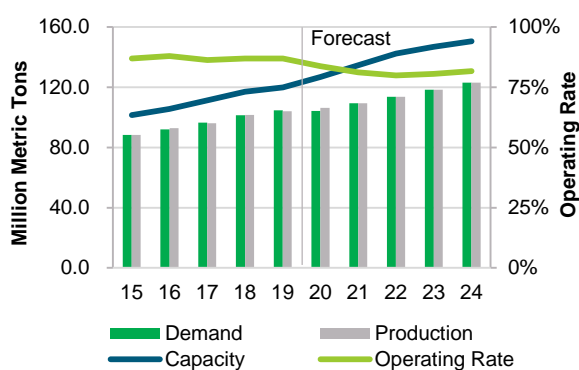
## Polyethylene – Global Supply & Demand

Despite being historically correlated with GDP, the PE industry is expected to disconnect from GDP and decline by only 0.3% in 2020, as COVID-19 has been a demand driver for some key PE demand segments such as food-related packaging, as well as delaying the implementation of plastic bag bans and encouraging the use of single-use plastics to limit the spread of the virus.

Over 2015-19, global capacity and demand have grown by 18.4 mtpa (4.3% AAGR) and 16.2 mtpa (4.3% AAGR) respectively. In 2019, global capacity and demand were at 119.9 mtpa and 104.6 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (25.4% of global production), North America (22.9%), and the Middle East (19.3%), while the top three consuming regions were Northeast Asia (38.4% of global demand), North America (15.1%), and West Europe (11.7%). Key net importers include Northeast Asia, Africa, and South America, while key net exporters include the Middle East and North America. Over 2019-24, global capacity and demand are projected to grow by 30.7 mtpa (4.7% AAGR) and 18.4 mtpa (3.3% AAGR) respectively. In 2019, HDPE accounts for the largest proportion at 45% of total polyethylene demand, LLDPE at 32%, and LDPE at 22%. On the other hand, over 2019-24, LLDPE is projected to have the highest demand AAGR at 4.3%, HDPE at 3.0%, and LDPE at 2.4%.

In recent years, investments have been increasingly concentrated in feedstock cost-advantaged regions such as North America and the Middle East, and high demand growth regions such as Asia Pacific, particularly China. In North America, low-cost feedstock from shale gas has revitalized the PE business, making PE exports highly competitive globally and leading to significant investments in the region. China is expected to lead in the new capacity additions with its self-sufficiency drive. The impact of these capacity additions is expected to result in significant change in global trade flows. In 2019, Southeast Asia moved from a net export position to a net import position. And vice versa, CIS & Baltic States is expected to move from a net importer to a net exporter from 2020 onwards. Middle East is expected to continue extending its position as the world's largest net exporter of PE followed by North America. Global operating rates are projected to decline to an average of 82% during 2019-24 from 87% during 2015-2019 due to rate of expansion to outpace the rate of demand growth.

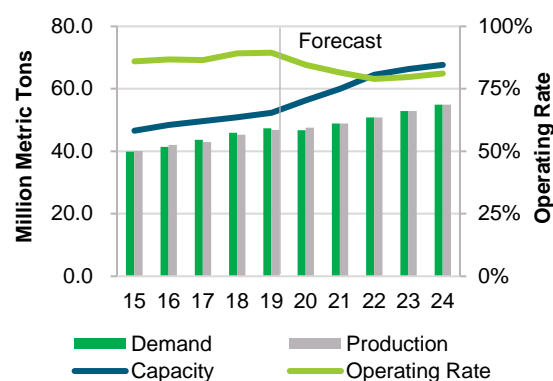
World: Polyethylene Supply & Demand



Source: IHS Markit

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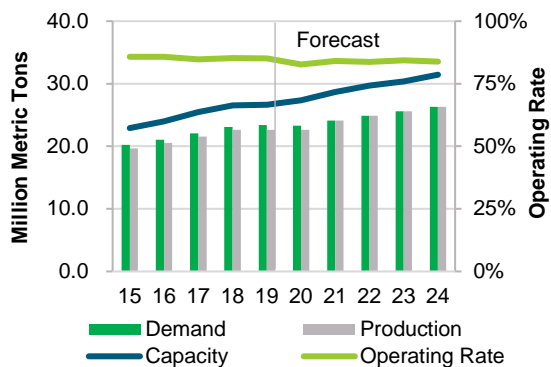
World: HDPE Supply & Demand



Source: IHS Markit

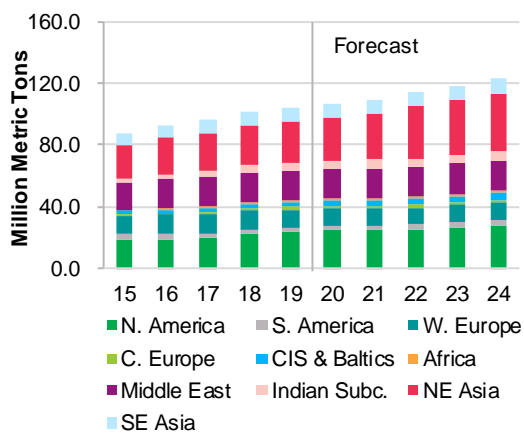
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**World: LDPE Supply & Demand**



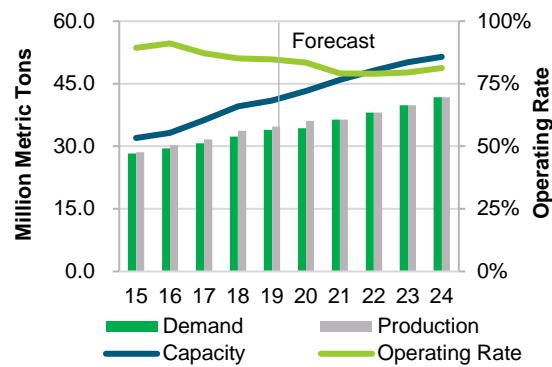
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**World: Total PE Production by Region**



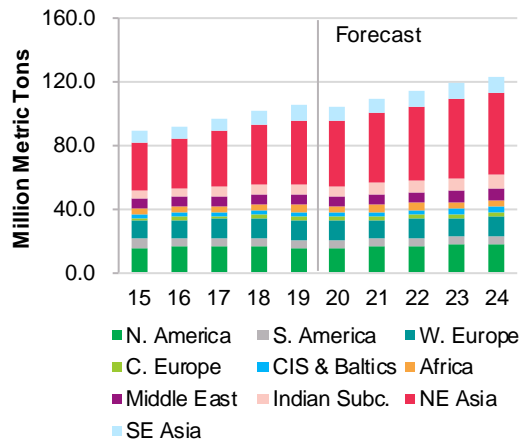
Source: IHS Markit © 2020 IHS Markit

**World: LLDPE Supply & Demand**



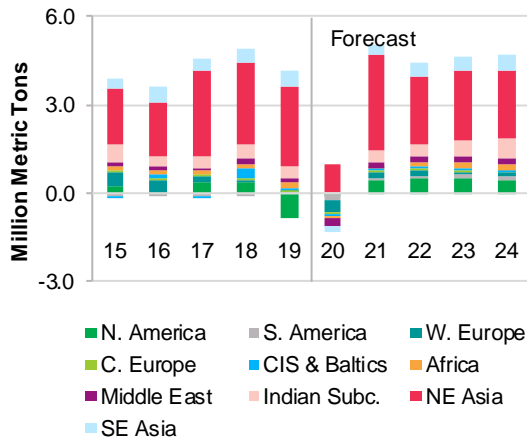
Source: IHS Markit © 2020 IHS Markit

**World: Total PE Demand by Region**



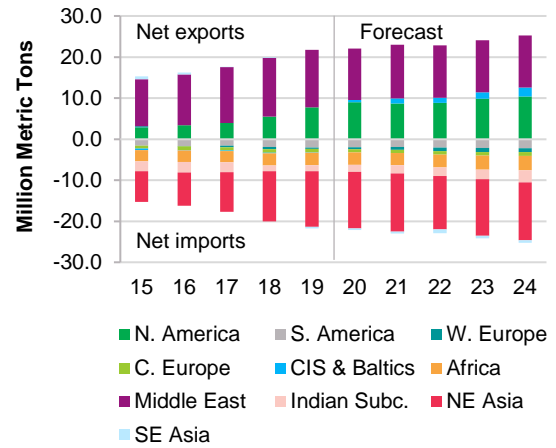
Source: IHS Markit © 2020 IHS Markit

**World: Total PE Demand Year on Year Growth**



Source: IHS Markit © 2020 IHS Markit

**World: Total PE Net Trade**

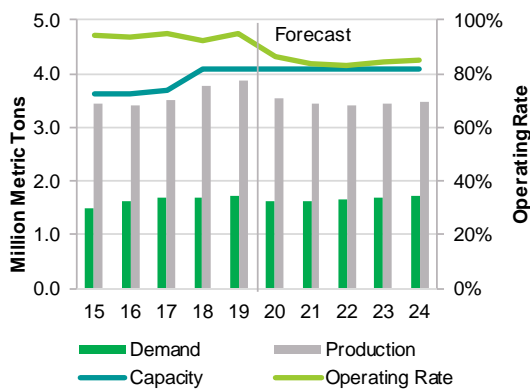


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*Polyethylene – Thailand Supply & Demand*

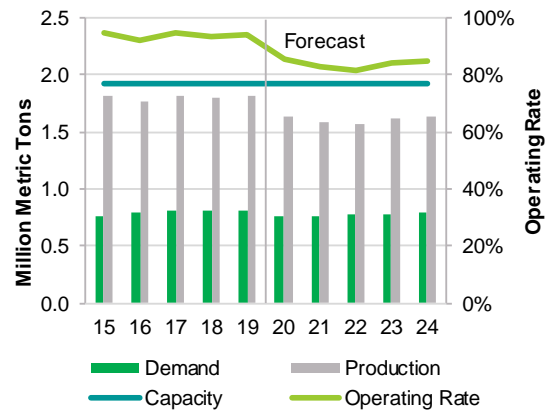
In 2019, Thailand production and domestic demand were at 3.9 mtpa and 1.7 mtpa respectively. The country has a total capacity of 4.1 mtpa and this is forecasted to remain unchanged over 2019-24. Operating rates are projected to remain high at an average of 86% over 2019-24.

**Thailand: Polyethylene Supply & Demand**



Source: IHS Markit © 2020 IHS Markit

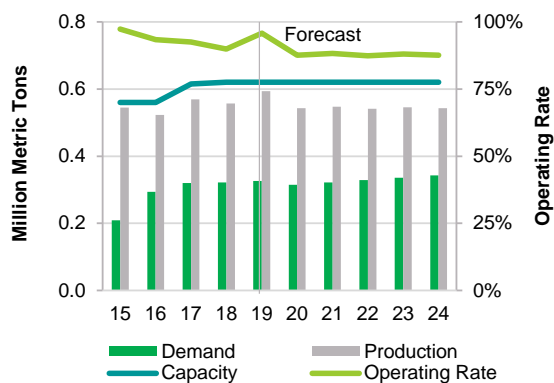
**Thailand: HDPE Supply & Demand**



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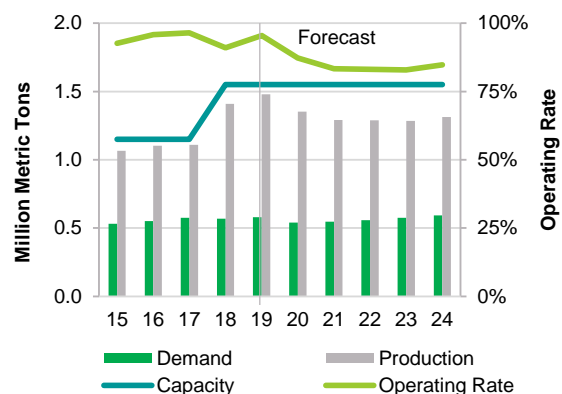
**Thailand: LDPE Supply & Demand**



Source: IHS Markit

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**Thailand: LLDPE Supply & Demand**



Source: IHS Markit

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**Polypropylene (As of 2021 World Analysis: Fall 2020 Update )**

Polypropylene is a lightweight and versatile polymer, with excellent chemical resistance, along with high rigidity and high melting point compared with other polymers such as polyethylene. Polypropylene is the second fastest growing commodity thermoplastic, surpassed only by LLDPE. Polypropylene is used in a wide range of applications including automotive components, household products, food and beverage containers, toys, diapers, etc.

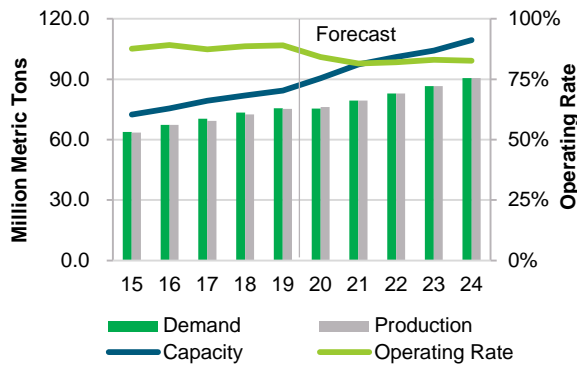
*Polypropylene – Global Supply & Demand*

Over 2015-19, global capacity and demand have grown by 11.9 mtpa (3.9% AAGR) and 11.8 mtpa (4.3% AAGR) respectively. In 2019, global capacity and demand were at 84.5 mtpa and 75.6 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (43.5% of global production), West Europe, (11.4%), and Middle East (11.0%), while the top three consuming regions were Northeast Asia (45.2% of global demand), West Europe (11.1%), and North America (10.3%). Key net importers include the Indian subcontinent, Northeast Asia, and Africa, while key net exporters include the Middle East and West Europe. Over 2019-24, global capacity and demand are projected to grow by 25.1 mtpa (5.3% AAGR) and 14.9 mtpa (3.7% AAGR) respectively.

Over the next five years, the global capacity is projected to reach 109.5 mtpa by 2024 led by major expansions occurring in Asia, primarily led by China in its push for self-sufficiency. The new capacity coming online will be focused on domestic demand, reducing the need for imports.

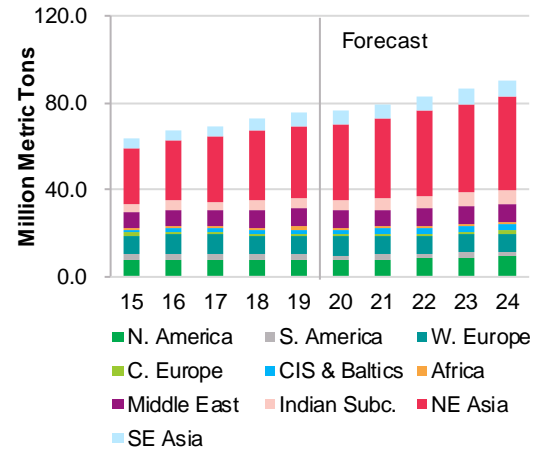
In 2020, polypropylene’s largest application globally is injection molding, at 32.7% of the demand. Film and sheet, at 25.4% of global demand is the second largest segment. Over 2019-24, Asia is projected to drive the demand growth, mainly from Northeast Asia and Indian subcontinent, making up 58% of the global demand in 2024 from 53% in 2019. Asia’s rapid economic development and large population is expected to drive the increased usage in plastic.

**World: Polypropylene Supply & Demand**



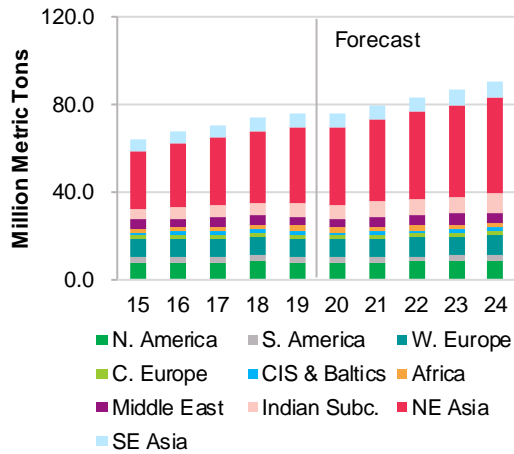
Source: IHS Markit © 2020 IHS Markit

**World: Polypropylene Production by Region**



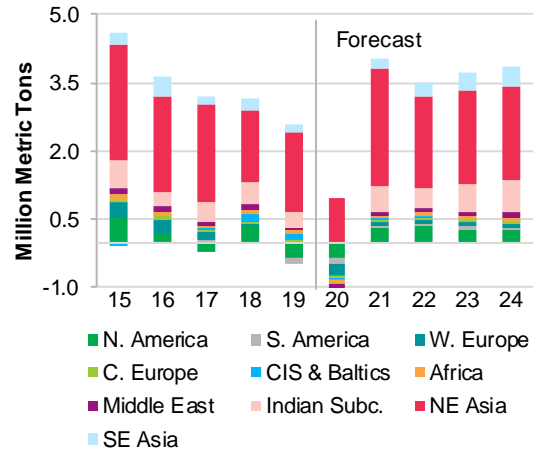
Source: IHS Markit © 2020 IHS Markit

**World: Polypropylene Demand by Region**



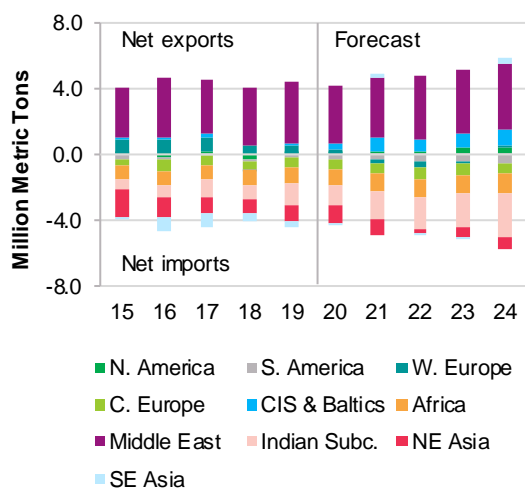
Source: IHS Markit © 2020 IHS Markit

**World: Polypropylene Demand Y-o-Y Growth**



Source: IHS Markit © 2020 IHS Markit

### World: Polypropylene Net Trade

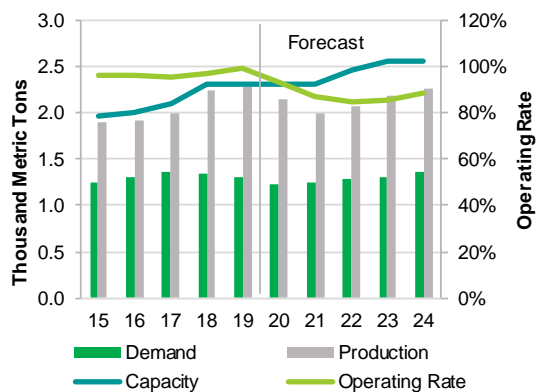


Source: IHS Markit © 2020 IHS Markit

### Polypropylene – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 2.3 mtpa and 1.3 mtpa respectively. The country has a total capacity of 2.3 mtpa which is forecasted to increase to 2.6 mtpa in 2023. Operating rates are projected to remain at an average of 89% over 2019-24.

### Thailand: Polypropylene Supply & Demand



Source: IHS Markit © 2020 IHS Markit

### EO-Based Products

#### Ethylene Oxide (As of 2021 World Analysis: Fall 2020 Update )

Ethylene oxide is a basic chemical that is primarily used for the production of other intermediate chemicals. Monoethylene Glycol (“MEG”) accounts for the largest demand for ethylene oxide at 67% in 2020. MEG is mainly used in the production of PET, which is subsequently used in the production of fibers, films, solid-state resins, and other consumables. Other end uses include higher-value derivatives such as ethoxylates, ethanolamines, glycol ethers, and polyether polyols.

## Ethylene Oxide – Global Supply & Demand

While global GDP is set to contract in 2020 as a result of COVID-19, EO demand growth remains positive, albeit weaker than prior years. Early indications suggest that economies, notably Asia, have bounced back to some extent. PET and polyester fiber appear to have weathered the economic crisis well and the outlook for future years remains positive.

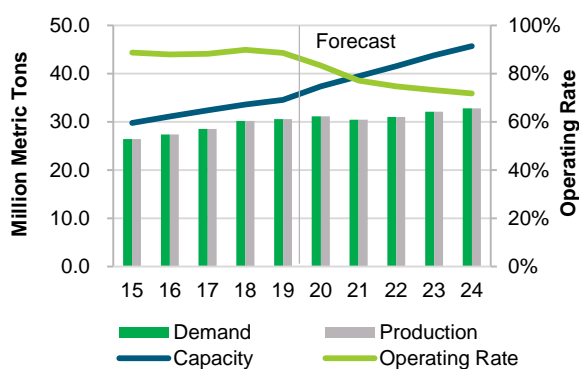
Over 2015-19, global capacity and demand have grown by 4.7 mtpa (3.8% AAGR) and 4.1 mtpa (3.7% AAGR) respectively. In 2019, global capacity and demand were at 34.5 mtpa and 30.6 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (36.1% of global production), the Middle East (26.5%), and North America (16.7%), while the top three consuming regions were Northeast Asia (36.1% of global demand), the Middle East (26.5%), and North America (16.7%). Over 2019-24, global capacity and demand are projected to grow by 11.2 mtpa (5.8% AAGR) and 2.2 mtpa (1.4% AAGR) respectively.

In the Middle East, the abundance of competitively priced ethane has provided a significant cost advantage for regional ethylene and ethylene derivative manufacturers, enabling the region to be the most cost-competitive ethylene oxide (and thus MEG) producing region in the world. North America is currently the second most cost competitive producer of ethylene, after the Middle East. With the renewed competitiveness, North America is projected to add 2.7 mtpa, versus 590 ktpa in the Middle East, of ethylene oxide capacity over 2019-24.

Global demand growth for ethylene oxide over 2015-19 was driven by strong economic conditions leading to higher growth above GDP trends. MEG contributes the largest proportion of demand for ethylene oxide. MEG is ultimately used to produce PET, which is used in a broad range of applications. Due to this, the demand outlook for MEG, and thus ethylene oxide, is broadly tied to the general economy, and is increasingly linked to emerging countries. Over 2019-24, ethylene oxide demand growth in Asia is estimated at 1.5 mtpa (2.0% AAGR).

While ethylene oxide producers enjoyed attractive margins between 2015-19, demand and margins are expected to be impacted by slowing economic growth, tariff wars and oversupply in the near future. Total forecasted capacity additions of 11.2 mtpa expected from 2019-24 will contribute to oversupply economics. Operating rates are expected to be reduced to 72% in 2024.

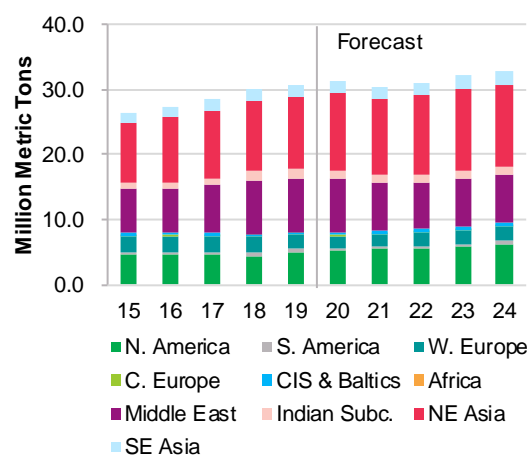
**World: Ethylene Oxide Supply & Demand**



Source: IHS Markit

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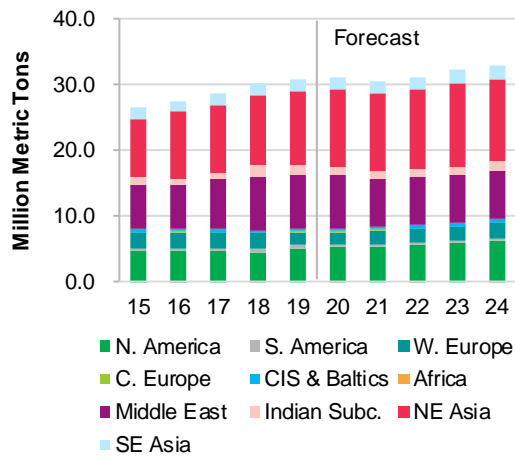
**World: Ethylene Oxide Production by Region**



Source: IHS Markit

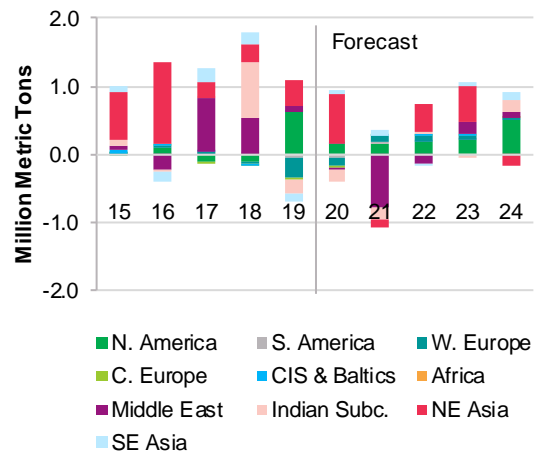
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**World: Ethylene Oxide Demand by Region**



Source: IHS Markit © 2020 IHS Markit

**World: Ethylene Oxide Demand Y-o-Y Growth**

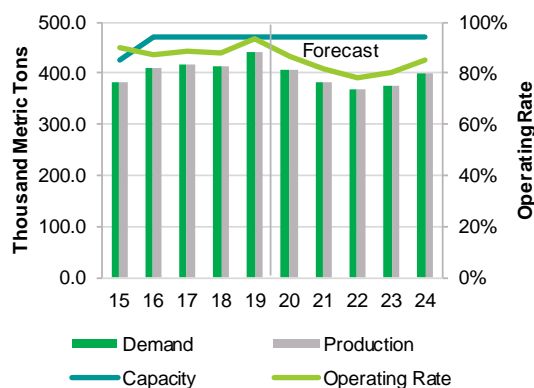


Source: IHS Markit © 2020 IHS Markit

*Ethylene Oxide– Thailand Supply & Demand*

In 2019, Thailand production and domestic demand were at 441 ktpa and 441 ktpa respectively. The country has a total capacity of 470 ktpa which is expected to remain unchanged throughout 2019-24. Operating rates are projected to average 84% over 2019-24 due to decline in production and demand.

**Thailand: Ethylene Oxide Supply & Demand**



Source: IHS Markit © 2020 IHS Markit

*Monoethylene Glycol (“MEG”) (As of 2021 World Analysis: Fall 2020 Update )*

MEG is an intermediate that is mainly used in the production of PET, which is subsequently used in the production of fibers, films, solid-state resins, and other consumables. PET accounted for 88.5% of 2019 global MEG demand.

*MEG – Global Supply & Demand*

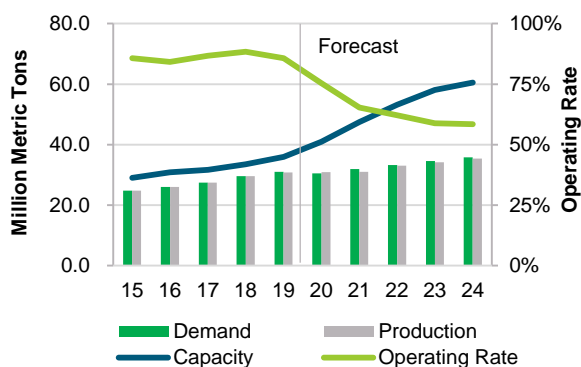
Over 2015-19, global capacity and demand have grown by 7.0 mtpa (5.5% AAGR) and 6.2 mtpa (5.7% AAGR) respectively. In 2019, global capacity and demand were at 36.0 mtpa and 31.0 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (40.7% of global production), the Middle East, (30.3%), and North America (13.1%), while the top three consuming regions were Northeast Asia (66.2% of global demand), the

Indian subcontinent (8.9%), and North America (7.8%). Key net importers include Northeast Asia, and the Indian subcontinent, while key net exporters include the Middle East and North America. Over 2019-24, global capacity and demand are projected to grow by 24.6 mtpa (11.0% AAGR) and 4.8 mtpa (2.9% AAGR) respectively.

In the Middle East, the abundance of competitively priced ethane has provided a significant cost advantage for regional ethylene and ethylene derivative manufacturers, enabling the region to be the most cost-competitive ethylene oxide (and thus MEG) producing region in the world. In Northeast Asia, the development of the textile industry has driven the construction of large-scale MEG plants. Together, the Middle East and Northeast Asia have accounted for about 70% of the MEG capacity additions during 2015-19. However, over the next five years, capacity growth will mainly be centered around Northeast Asia and North America. North America is currently the second most cost competitive producer of ethylene, after the Middle East, as a result of the shale gas revolution.

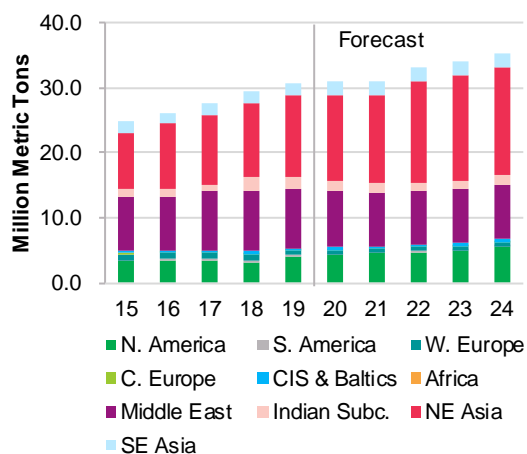
Global MEG production is fairly concentrated, with the top ten producers accounting for about half of the global capacity in 2020. Leading producers include SABIC, SINOPEC, Formosa Plastics, Shell and Lotte Chemical (through direct ownership or joint venture partnerships).

**World: MEG Supply & Demand**



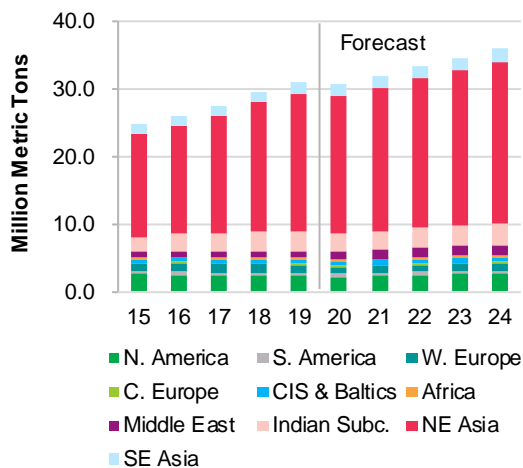
Source: IHS Markit © 2020 IHS Markit

**World: MEG Refinery Production by Region**



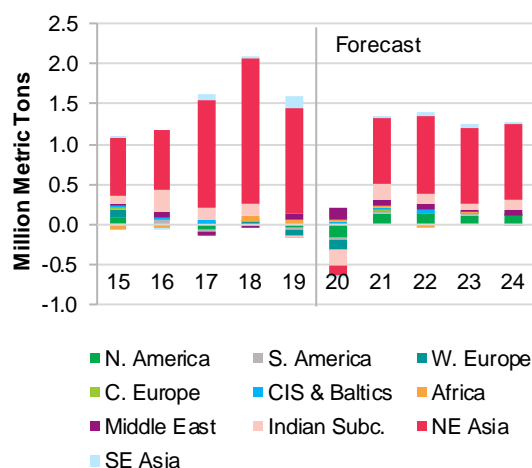
Source: IHS Markit © 2020 IHS Markit

**World: MEG Demand by Region**



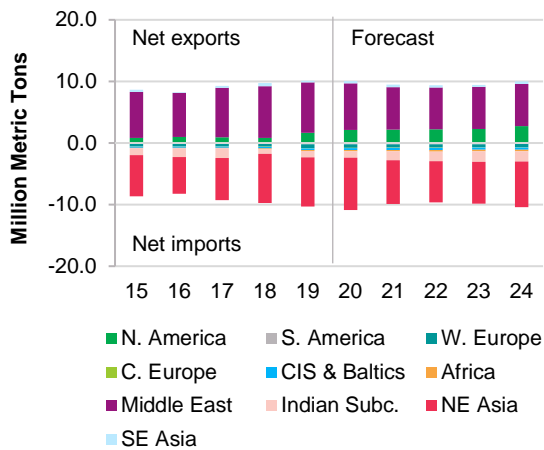
Source: IHS Markit © 2020 IHS Markit

**World: MEG Demand Y-o-Y Growth**



Source: IHS Markit © 2020 IHS Markit

## World: MEG Net Trade



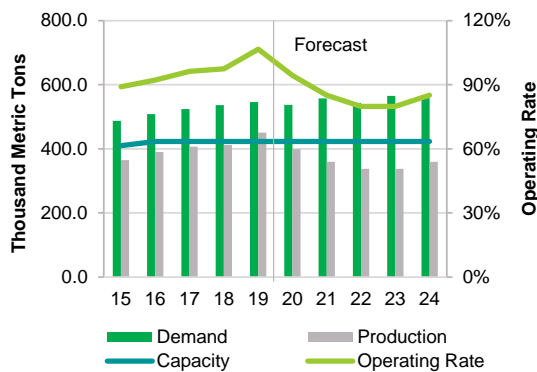
Source: IHS Markit

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## MEG – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 451 ktpa and 546 ktpa respectively. The country has a total capacity of 423 ktpa and this is forecasted to remain unchanged till 2025. Operating rates is expected to remain around an average of 88% during 2019-24.

## Thailand: MEG Supply & Demand



Source: IHS Markit

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## Performance Materials and Chemicals

### Propylene Oxide (As of 2021 World Analysis: Fall 2020 Update)

Propylene oxide is a highly reactive chemical intermediate primarily used for the production of polyether polyols, propylene glycols, and 1,4-butanediol. Polyether polyols are the largest outlet for propylene oxide, accounting for around 75% of global demand in 2019. Polyether polyols are used in the synthesis of polyurethanes (“PU”), which are used in a wide range of products such as furniture, cars, bedding, appliances, packaging, adhesives and sealants, and surface coatings.

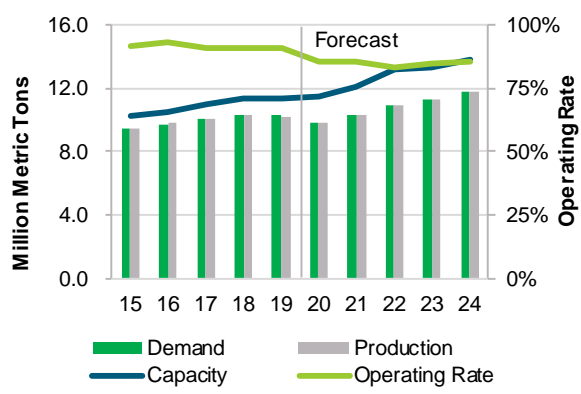
*Propylene Oxide – Global Supply & Demand*

Over 2015-19, global capacity and demand have grown by 1.0 mtpa (2.4% AAGR) and 920 ktpa (2.4% AAGR) respectively. In 2019, global capacity and demand were at 11.3 mtpa and 10.3 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (36.7% of global production), West Europe, (23.9%), and North America (21.8%), while the top three consuming regions were Northeast Asia (41.0% of global demand), West Europe (24.4%), and North America (19.6%). Over 2019-24, global capacity and demand are projected to grow by 2.5 mtpa (4.0% AAGR) and 1.4 mtpa (2.6% AAGR) respectively.

Global growth in demand is expected to be aligned with GDP growth and primarily driven by Asia Pacific. China’s propylene oxide demand is expected to grow 4.2% over 2019-24, driven by strong growth in polyurethane demand, housing and automotive manufacturing. Demand from India is also expected to grow as the middle class is projected to expand in the coming years. Hence in Asia, over 2019-24, propylene oxide demand is projected to grow by another nearly 1.0 mtpa, accounting for around 70% of global demand growth. Production of propylene oxide is sited primarily in regions of strong consumption due to its relatively expensive cost of transportation.

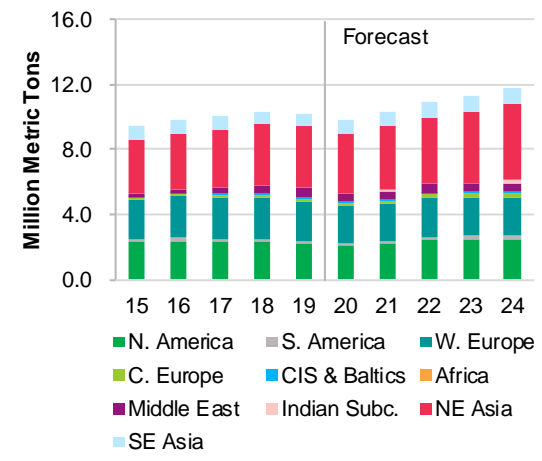
Asia Pacific, commanding the largest capacity share is expected to account for around half of global capacity additions over 2019-24, followed by North America and Indian Subcontinent.

**World: Propylene Oxide Supply & Demand**



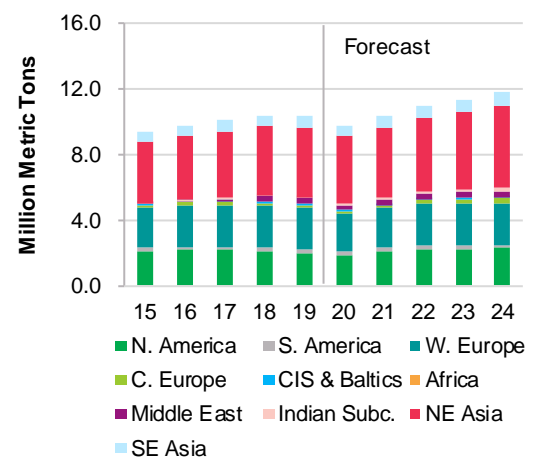
Source: IHS Markit © 2020 IHS Markit

**World: Propylene Oxide Production by Region**



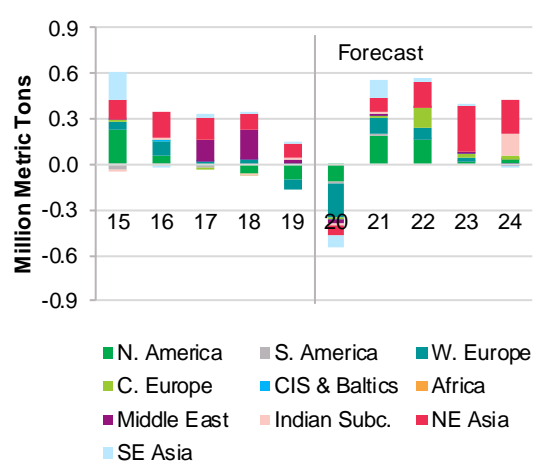
Source: IHS Markit © 2020 IHS Markit

**World: Propylene Oxide Demand by Region**



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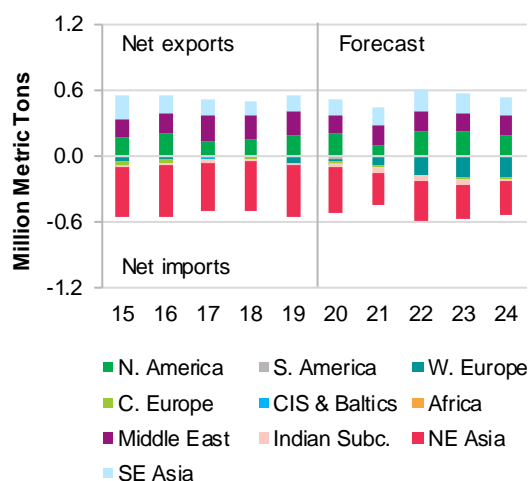
**World: Propylene Oxide Demand Y-o-Y Growth**



Source: IHS Markit © 2020 IHS Markit



### World: Propylene Oxide Net Trade by Region

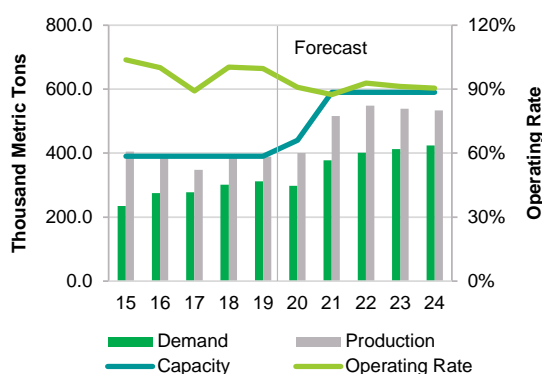


Source: IHS Markit © 2020 IHS Markit

### Propylene Oxide – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 389 ktpa and 312 ktpa respectively. The country has a total capacity of 390 ktpa which is expected to increase to 590 ktpa in 2021. Operating rates are projected to remain high at an average of 92% over 2019-24.

### Thailand: Propylene Oxide Supply & Demand



Source: IHS Markit © 2020 IHS Markit

### Phenol (As of 2021 World Analysis: Fall 2020 Update)

Phenol is an alcohol that has an aromatic (benzene ring) type structure. It is an important basic chemical for many other intermediate chemicals.

### Phenol – Global Supply & Demand

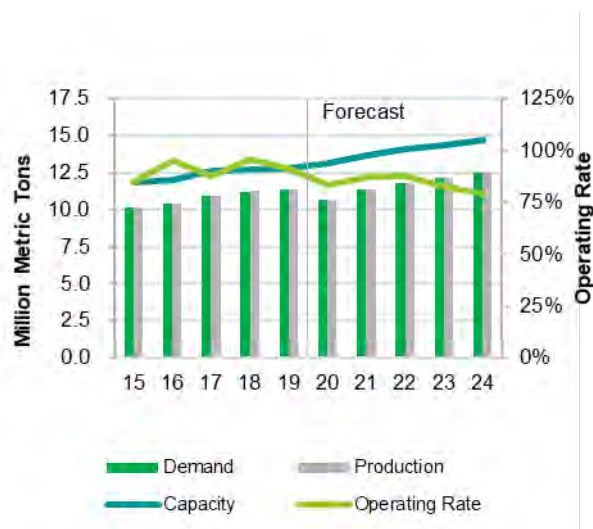
The strongest demand growth is expected to be from Asia Pacific where demand is projected to grow by another 896 ktpa over 2019-24. As a result of COVID-19, demand for polycarbonate, liquid epoxy resin, and industrial nylons were all impacted as automotive plants closed. Benzene prices falling as a result of COVID-19 also led to phenol producer’s margins being squeezed. However, there are clear signs of recovery in the near future.

Over 2015-19, global capacity and demand have grown by 992 ktpa (2.0% AAGR) and 1.2 mtpa (2.8% AAGR) respectively. In 2019, global capacity and demand were at 12.9 mtpa and 11.3 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (46.0% of global production), North America (19.1%) and West Europe (18.3%) while the top three consuming regions were Northeast Asia (48.6% of global demand), West Europe (18.5%), and North America (18.0%). Key net importers include Northeast Asia, and the Indian subcontinent, while key net exporters include Southeast Asia and Middle East. Over 2019-24, global capacity and demand are projected to grow by 2.3 mtpa (3.3% AAGR) and 1.1 mtpa (1.9% AAGR) respectively.

The global phenol industry continues to be driven by demand for bisphenol A (“BPA”), which accounts for nearly half of global consumption in 2019. BPA is driven by polycarbonate (“PC”) demand, which has consistently been above GDP levels. Phenol-formaldehyde resins (“PF resins”), which accounts for around 30.0% of global consumption, are the second-largest end use for phenol and are used mainly in the construction industry. The major driver for phenol growth will be BPA, while other derivatives will grow at a slower pace.

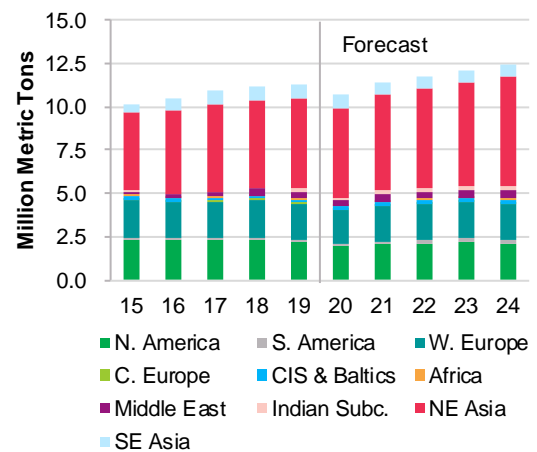
Northeast Asia is projected to account for 1.8 mtpa, around 80.0% of global capacity additions over 2019-24 as producers seek to capitalize on the strong demand growth in the region. Northeast Asia changed from a net exporter to a net importer since 2017 and will remain its deficit position throughout the forecast period.

**World: Phenol Supply & Demand**



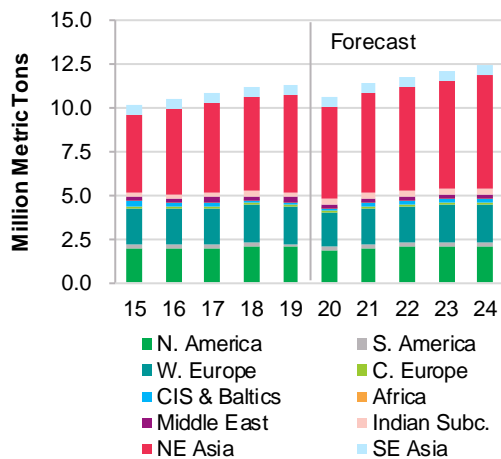
Source: IHS Markit © 2020 IHS Markit

**World: Phenol Production by Region**



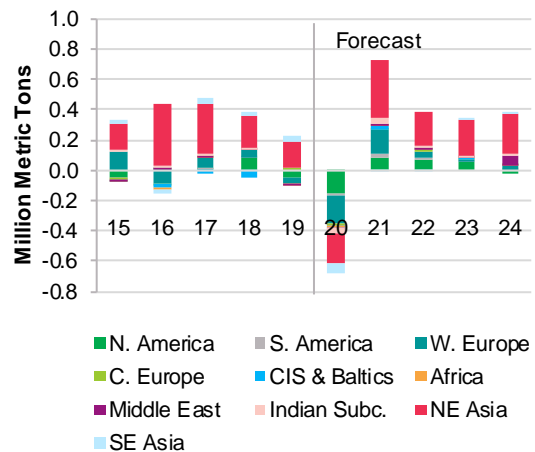
Source: IHS Markit © 2020 IHS Markit

**World: Phenol Demand by Region**



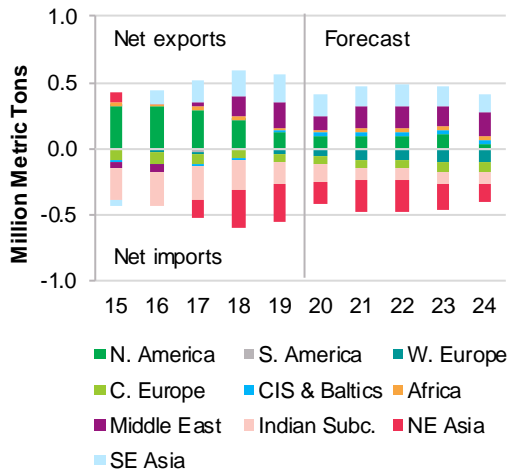
Source: IHS Markit © 2020 IHS Markit

**World: Phenol Demand Y-o-Y Growth**



Source: IHS Markit © 2020 IHS Markit

### World: Phenol Net Trade

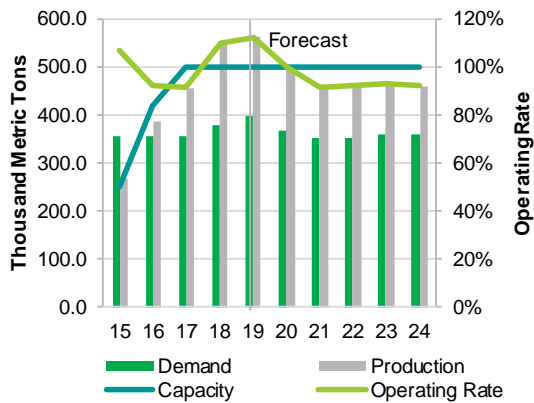


Source: IHS Markit © 2020 IHS Markit

### Phenol – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were at 561 ktpa and 399 ktpa respectively. The country phenol production capacity is expected to remain at 500 ktpa until 2024. Operating rates are projected to average 97% over 2019-24. Key producers in Southeast Asia include Mitsui Phenols and PTT Phenols.

### Thailand: Phenol Supply & Demand



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**Purified Terephthalic Acid (“PTA”) (As of 2021 World Analysis: Fall 2020 Update)**

PTA is mainly used as a raw material in the downstream PET fiber market and PET packaging resin markets.

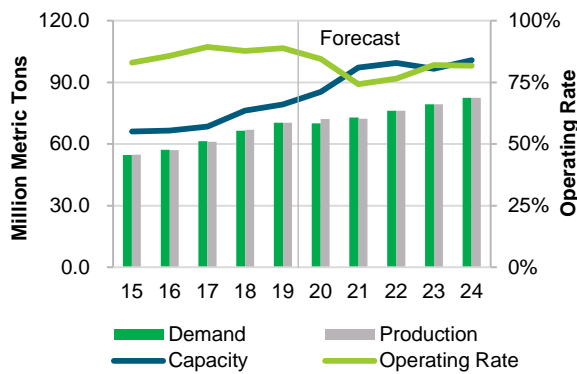
**PTA – Global Supply & Demand**

Following the COVID-19 pandemic impact, PTA demand is expected to marginally decline in 2020, before returning to cycle average growth rates in 2021 and beyond. A significant amount of inventory in PTA and polyester has built up in mainland China in 2020, which has helped cushion a large portion of the demand decline. The demand loss in 2020 is expected to be more long-term in nature, as consumer lifestyles are expected to change following the pandemic.

Over 2015-19, global capacity and demand have grown by 13.2 mtpa (4.7% AAGR) and 15.6 mtpa (6.5% AAGR) respectively. In 2019, global capacity and demand were at 79.3 mtpa and 70.3 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (74.2% of global production), Indian subcontinents (7.9%) and North America (5.6%) while top three consuming regions are Northeast Asia (70.1% of global demand), Indian subcontinents (9.3%) and Southeast Asia (5.8%). Key net importers include Middle East, Indian subcontinent and CIS & Baltics, while key net exporters are Northeast Asia. Over 2019-24, global capacity and demand are projected to grow by 21.6 mtpa (4.9% AAGR) and 12.1 mtpa (3.2%) respectively.

Over 2019-24, significant capacity is expected to come online from Asia. Northeast Asia is projected to add 19.4 mtpa (around 90% of global additional capacity), while the Indian subcontinent is projected to add 1.2 mtpa (5.7% of global capacity additions). Capacity growth in Northeast Asia is driven by China’s efforts to backward integrate and become self-sufficient.

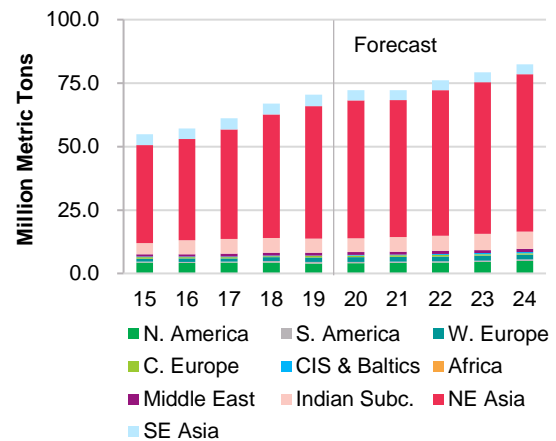
**World: PTA Supply & Demand**



Source: IHS Markit

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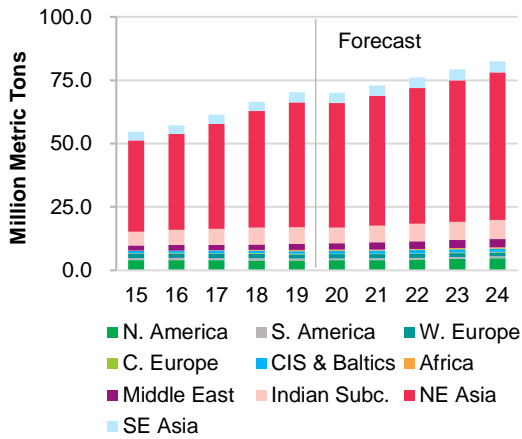
**World: PTA Production by Region**



Source: IHS Markit

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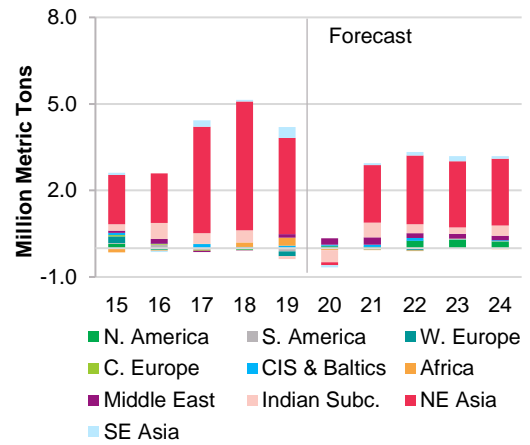
### World: PTA Demand by Region



Source: IHS Markit

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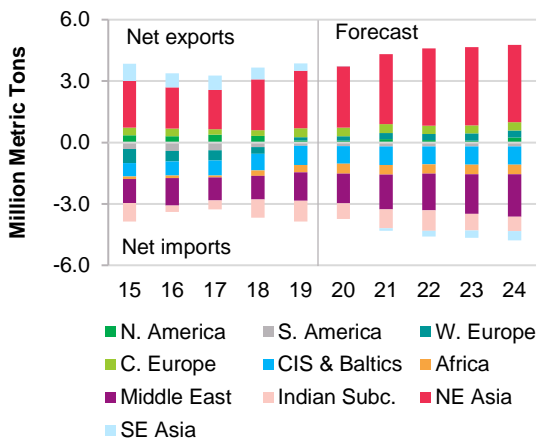
### World: PTA Demand Y-o-Y Growth



Source: IHS Markit

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### World: PTA Net Trade



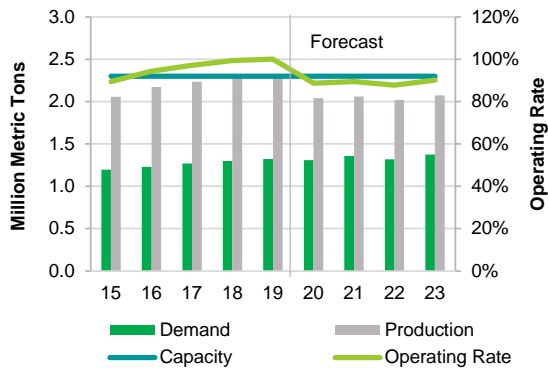
Source: IHS Markit

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### PTA – Thailand Supply & Demand

In 2019, Thailand production and domestic demand were both at 2.3 mtpa and 1.3 mtpa respectively. Over 2019-24, Thailand's production is projected to decrease by 249 kta (-2.3% AAGR), while demand is projected to increase slightly by 31 kta (0.5% AAGR) with capacity expected to remain at 2.3 mtpa through 2024.

**Thailand: PTA Supply & Demand**



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**Polyethylene Terephthalate (“PET”) Bottle Resins (As of 2021 World Analysis: Fall 2020 Update)**

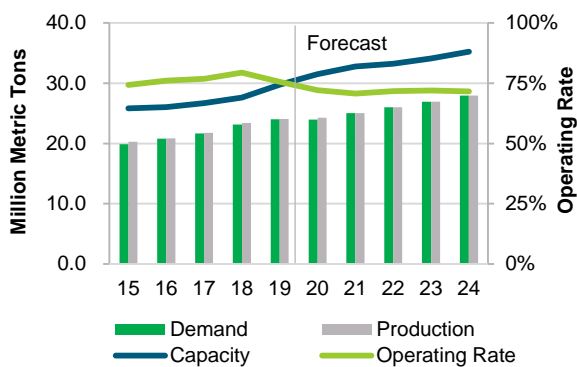
PET melt phase resins are further polymerized before usage in bottle and packaging applications. The combination of good physical, optical and lightweight properties has allowed PET bottle resins to gradually displace glass bottles.

*PET Bottle Resins – Global Supply & Demand*

Over 2015-19, global capacity and demand have grown by 4.0 mtpa (3.6% AAGR) and 4.1 mtpa (4.8% AAGR) respectively. In 2019, global capacity and demand were at 29.8 mtpa and 24.0 mtpa respectively. In 2019, the top three producing regions were Northeast Asia (43.7% of global production), North America (14.6%) and West Europe (8.1%) while the top three consuming regions were Northeast Asia (30.0% of global demand), North America (16.7%) and West Europe (11.3%). Key net importers include Africa, South America and Western Europe, while key net exporters include the Northeast Asia and Indian subcontinent. Over 2019-24, global capacity and demand are projected to grow by 5.5 mtpa (3.4% AAGR) and 3.9 mtpa (3.1% AAGR) respectively.

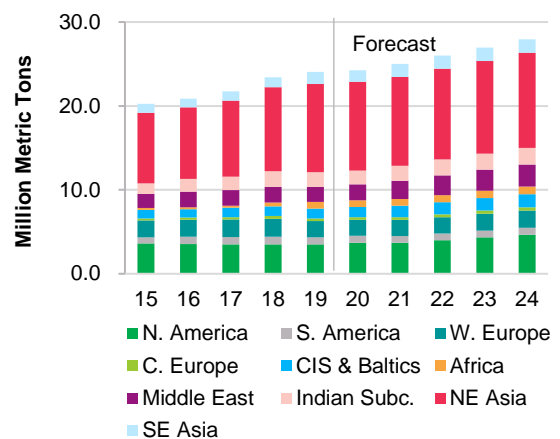
Over 2019-24, Northeast Asia is expected to remain the largest consumption center, accounting for 1.3 mtpa increment in demand. This is primarily driven by China, owing to its large population, on-going urbanization and overall improvement in living standards. The rise of average disposable income has also led to increased beverage consumption in China.

**World: PET Bottle Resins Supply & Demand**



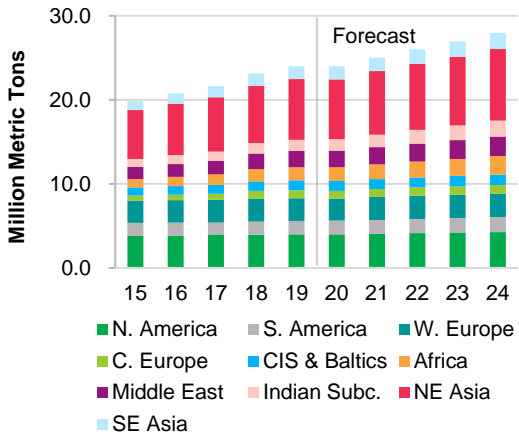
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**World: PET Bottle Resins Production by Region**



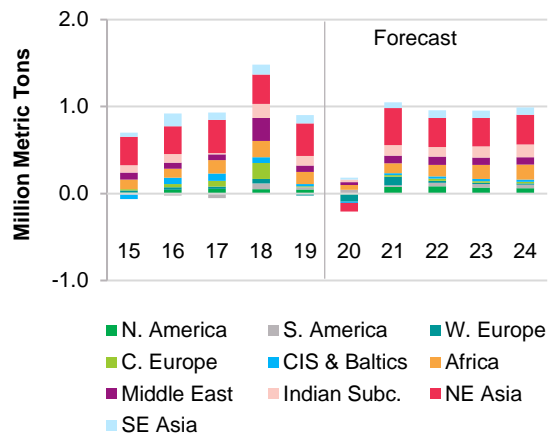
Source: IHS Markit © 2020 IHS Markit

**World: PET Bottle Resins Demand by Region**



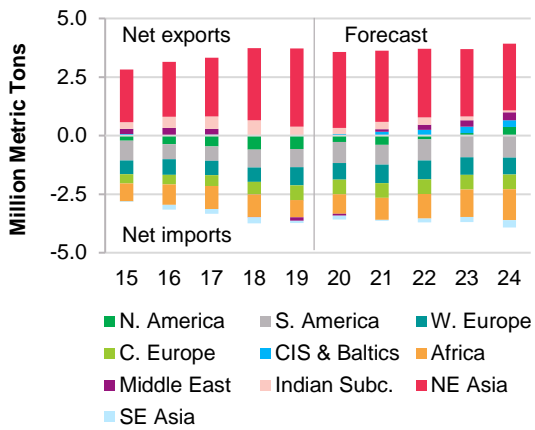
Source: IHS Markit © 2020 IHS Markit

**World: PET Bottle Resins Demand Y-o-Y Growth**



Source: IHS Markit © 2020 IHS Markit

**World: PET Bottle Resins Net Trade**

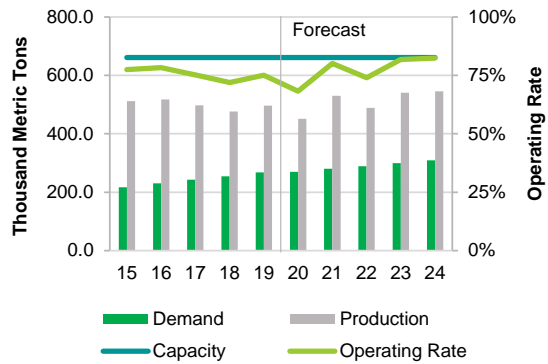


Source: IHS Markit © 2020 IHS Markit

*Polyethylene Terephthalate – Thailand Supply & Demand*

In 2019, Thailand production and domestic demand were at 496 ktpa and 268 ktpa respectively. The country has a total capacity of 661 ktpa and this is forecasted to remain unchanged until 2024. Operating rates is expected to remain around an average of 77% over 2019-24.

**Thailand: PET Bottle Resins Supply & Demand**



Source: IHS Markit

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## CORPORATE HISTORY AND CORPORATE STRUCTURE

### Corporate History

The following table sets forth the key corporate milestones in our operating history.

Year	Event
2005	PTT Chemical Public Company Limited (“ <b>PTTCH</b> ”), our first predecessor entity, was formed through the amalgamation of National Petrochemical Public Company Limited and Thai Olefins Public Company Limited (“ <b>Thai Olefins</b> ”) and registered with the Ministry of Commerce of Thailand. Trading of common shares of PTTCH commenced on the SET.
2007	PTT Aromatics and Refining Public Company Limited (“ <b>PTTAR</b> ”), our second predecessor entity, was formed through the amalgamation of The Aromatics (Thailand) Public Company Limited and Rayong Refinery Public Company Limited and was registered with the Ministry of Commerce of Thailand.
2008	Trading of common shares of PTTAR commenced on the SET.
2011	<p>The Board of Directors of PTT, PTTCH and PTTAR agreed to the amalgamation of PTTAR and PTTCH (the “<b>Amalgamation</b>”) and the shareholders of PTTCH and PTTAR separately approved the Amalgamation.</p> <p>As a result of the Amalgamation, GC was formed and registered with the Ministry of Commerce of Thailand. Trading of common shares of GC commenced on the SET on October 21, 2011 under the abbreviation “PTTGC,” classified under Petrochemicals and Chemicals.</p> <p>Our combined petrochemical capacity was 8.49 metric tons per year.</p>
2012	<p>We completed investments in NatureWorks, a biopolymer company producing polylactic acid and Vencorex (formerly, Perstorp Holding France SAS), a manufacturer of isocyanates in Asia and Europe.</p> <p>We issued US\$1.0 billion senior unsecured fixed rate notes due 2022 in accordance with Rule 144A and Regulation S. The notes were rated BBB and Baa2 by S&amp;P and Moody’s, respectively.</p>
2013	<p>We acquired a 40% interest in PTT Phenol Company and entered into a construction contract for the Phenol 2 Project. Together with Myriant Corporation, we established Auria Biochemicals Company Limited for the research and development of bio-based chemicals.</p> <p>Our shareholders approved the entire business transfer of Bangkok Polyethylene Public Company Limited and PTT Polyethylene Company Limited as well as activities relating to GC.</p> <p>We commenced construction of the Life Science Research &amp; Technology Center at our office in Rayong and opened the enclosed ground flare located in Olefin Plant 3 and the vapor recovery unit in Aromatics Plants 1 and 2 to promote clean technology. We also entered into the EPC contract for the Aromatics 2 Debottlenecking Project.</p> <p>We entered into a joint venture agreement with PT Pertamina (Persero) to invest in a petrochemical complex in Indonesia.</p>
2014	We issued THB10 billion domestic, unsecured, unsubordinated debentures with a 7-year tenor to the public. The debentures were rated AA(th) by Fitch Ratings Thailand.

<b>Year</b>	<b>Event</b>
	<p>We launched the bioplastic (PLA) yogurt cup – the first to be used for commercially viable purposes in Thailand.</p> <p>We commenced construction for our HDI derivative project and Aromatics II debottlenecking project both in Rayong Province.</p> <p>We entered into a joint venture agreement with PT Pertamina Patra Niaga by investing in PT Indo Thai Trading, for the sale of polymer- based and petrochemical products in Indonesia.</p>
2015	<p>We developed the Amazon Bio Cup, made from bioplastics and 100% from plants, in collaboration with NatureWorks and PTT.</p> <p>We acquired a 25% interest in PTT Polymer Marketing Co., Ltd. and a 50% interest in PTT Polymer Logistics Co., Ltd.</p> <p>Our associate, Global Power Synergy Public Company Limited (“<b>GPSC</b>”) completed its initial public offering on the SET in May 2017. Following the offering, our shareholdings in GPSC decreased from 30.31% to 22.73%.</p> <p>Our Board of Directors approved the LLDPE Expansion Project and Comonomer Hexene-1 Project.</p> <p>We established our presence in the USA through the formation of GC America Corporation and GC America LLC.</p> <p>We opened our Science and Innovation Center in Rayong to support research and development initiatives.</p>
2016	<p>We entered into an agreement with Japanese specialty chemical company Kuraray Co., Ltd. and with Japan-based international trading company Sumitomo Corporation to perform front-end engineering design (FEED) for the development of manufacturing and sales capabilities for super engineering plastic (high-heat resistant polyamide-9T) and hydrogenated styrenic block copolymer products in Thailand.</p> <p>We established Pracharath Rak Samakkee Rayong (Social Enterprise) Co. Ltd. in collaboration with the state, private sector, academic and civil society organizations with the goal of strengthening Rayong’s economy.</p>
2017	<p>On July 3, 2017, we completed the Asset Injection Project</p> <p>Our subsidiary, Solution Creation Company Limited, entered into joint venture agreements with various entities in Myanmar for the construction of a plastic forming plant, manufacture of plastics and development of the plastic packaging market generally in Myanmar.</p> <p>Our subsidiary, Global Green Chemicals Public Company Limited (“<b>GGC</b>”) completed its initial public offering on the SET in May 2017, raising THB2.8 billion. After its initial public offering, as of March 31, 2018, we hold a 72.29% interest in GGC.</p> <p>We issued THB10 billion domestic, unsecured, unsubordinated debentures with a 4-year tenor to the public. The debentures were rated AA(th) by Fitch Ratings Thailand.</p> <p>We approved an investment in GC Polyols, a manufacturer and distributor of polyols, for the production of polyurethane. GC Polyols is a GC joint venture with</p>

Year	Event
	<p>Sanyo Chemical and Toyota Tsusho. We also established GC Oxirane Co., Ltd. to invest in propylene oxide manufacturing.</p> <p>We founded San Phalang Social Enterprise Co., Ltd., a joint venture with PTT and other members of the PTT Group.</p> <p>Our combined petrochemical capacity was 9.71 metric tons per year.</p>
2018	<p>On March 27, 2018, we approved plan to invest in the new olefins plant at the name plate capacity of 500,000 metric tons per year of Ethylene and 250,000 metric tons per year of Propylene which increases total nameplate capacity of olefins to 3,738,000 metric tons per year utilizing Naphtha and Liquefied Petroleum Gas (LPG) as the main feedstock located in Map ta Phut Industrial Estate, Rayong Province. The total investment of this project is approximately USD985 million. The new olefins plant is expected to commercially operate within the first quarter of 2021.</p> <p>We founded a wholly-owned subsidiary, GC Estate Company Limited, with paid-up capital of THB1.3 billion mainly for the purpose of land and asset management supporting investment of the company and/or joint venture company.</p> <p>diversi Ltd. will manufacture High Heat Resistant Polyamide-9T, a super engineering plastic, with a total capacity of 13,000 tons per year, in addition to Hydrogenated Styrenic Block Copolymers with a total capacity of 16,000 tons per year. The total investment of this project is approximately THB15 billion and the project is expected to commence commercial operations in 2022.</p> <p>In December 2018, we and our affiliates completed the acquisition of a 74% interest in GC-M PTA, a manufacturer of purified terephthalic acid products, and a 74% interest in Thai PET Resin Company Limited, a manufacturer of polyethylene terephthalate products, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. for THB5,371.7 million.</p>
2019	<p>In March 2019, we completed the acquisition of a 49% interest in Revolve Group Limited (“RGL”), a producer and supplier of polymer and related products based in the United Kingdom, for GBP6.4 million. This investment will support our expansion into performance chemical products.</p> <p>On June 26, 2019, we reached the Sales and Purchase agreement to divested all of 49% shares in PT Indo Thai Trading with total value from the sale of share equal to THB227 million.</p>
2020	<p>On February 3, 2020, we completed the establishment of a joint venture company, ENVICCO Co., Ltd., to engage in the manufacture and distribution of high-quality recycled plastic resins with overall production capacity of 45,000 tons per year comprised of rPET capacity of 30,000 tons per year and rHDPE capacity of 15,000 Ton per year. GC holds 70% of total shares in ENVICCO, while 30% is held by ALPLA. The project will be located at Asia Industrial Estate in Rayong province and is expected to commence commercial operations date within the fourth quarter of 2021.</p> <p>On July 31, 2020, we completed an investment in a Polypropylene (PP) compound business with the acquisition of 41.5% of shares of DynaChisso Thai Company Limited (“DYCT”), a PP compound resin producer with capacity of 30,000 tons per year, from Dynachem Hong Kong Limited. This investment is in line with GC’s business strategy to expand into the downstream business.</p> <p>On December 19, 2020, GC Oxirane commenced commercial operations of its propylene oxide plant with production capacity of 200,000 tons per year.</p>

**Year**

**Event**

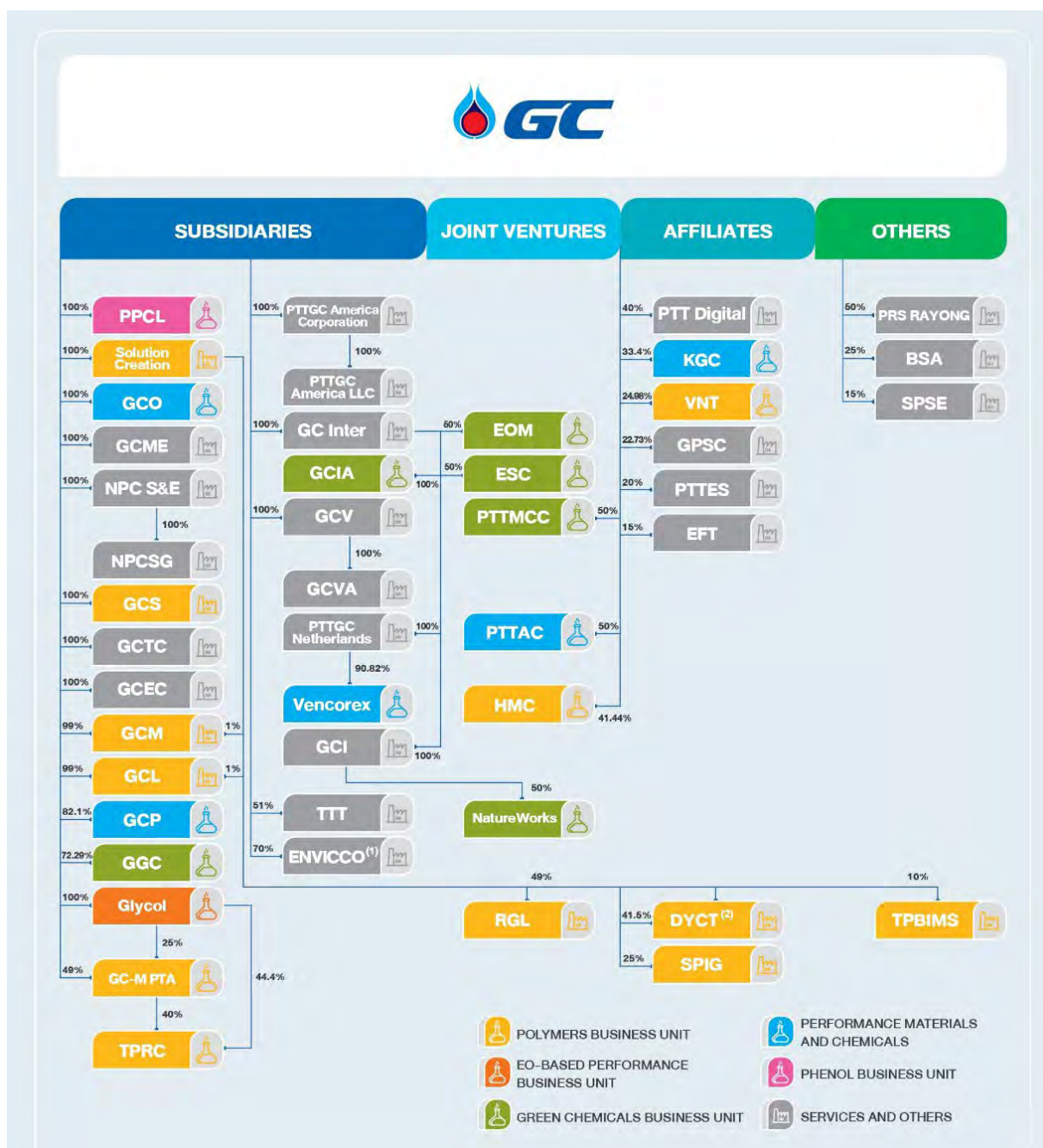
2021

On December 30, 2020, GC Polyols commenced commercial operations of polyols plant with production capacity of 180,000 tons per year.

On January 26, 2021, we announced the final investment decision on the OMP Project, which will allow us to increase the use of propane as feedstock and is aligned with our strategy to enhance feedstock flexibility and long-term competitiveness. The project is planned to commence commercial operations within the first quarter of 2023 with a total investment of approximately US\$165 million.

**Corporate Structure**

The following diagram summarizes our corporate structure as of the date of this Offering Memorandum.



Note: Significant changes in the shareholding structure in subsidiaries and affiliates from January 1, 2020 to December 31, 2020:  
(1) February 3, 2020: ENVICCO was established which GC holds 70% of the shares in ENVICCO.  
(2) July 31, 2020: The company invested in DYCT through Solution Creation, as a result holding 41.5% of the shares.

### Consolidated Subsidiaries and Jointly-Controlled Associates

The following table sets forth our consolidated subsidiaries and jointly-controlled associates and their respective businesses as of December 31, 2020.

Name of Entity	Principal Activities	Country of Incorporation	Effective Equity Interest (%)
<b>Direct subsidiaries</b>			
Global Green Chemicals Plc.	Manufacturing and distributing oleochemicals	Thailand	72.29
GC Glycol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100.00
GC Polyols Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	82.10
GC Marketing Solutions Co., Ltd.	Development, marketing and distributing polymers products, by-products and other polymers-related products	Thailand	100.00
GC Maintenance and Engineering Co., Ltd.	Factory maintenance and engineering services	Thailand	100.00
GC Logistics Solutions Co., Ltd.	Transportation, warehouse and bagging packing management of polyethylene plastic pellets	Thailand	100.00
GC Ventures Co., Ltd.	Invest in form of Corporate Venture Capital (CVC)	Thailand	100.00
GC Treasury Center Co., Ltd.	Financial service management for the group	Thailand	100.00
GC Styrenics Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100.00
GC Oxirane Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100.00
GC-M PTA Co., Ltd. (49% Direct interest and 25% Indirect interest) (Formerly Siam Mitsui PTA Co., Ltd.)	Manufacturing and distributing petrochemical products	Thailand	74.00
GC Estate Co., Ltd.	Real estate development for rent and to invest in petrochemical and related industries	Thailand	100.00
Solution Creation Co., Ltd.	Manufacturing and distributing petrochemical products and health and nutrition products	Thailand	100.00
Thai Tank Terminal Limited	Service for the storage and handling of liquid chemicals, oil and gas	Thailand	51.00
PTT Phenol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100.00
NPC Safety and Environmental Service Co., Ltd.	Providing safety and environmental services	Thailand	100.00
PTTGC America Corporation	Holding and operating international business	United States of America	100.00
PTTGC International Private Limited	Holding and operating international business	Singapore	100.00

Name of Entity	Principal Activities	Country of Incorporation	Effective Equity Interest (%)
ENVICCO Limited	Manufacturing, commercializing, selling and developing of recycled polyethylene terephthalate (rPET) and recycled high density polyethylene (rHDPE)	Thailand	70.00
<i>Indirect subsidiaries</i>			
GGC Biochemicals Co., Ltd.	Holding and operating in Thailand	Thailand	72.29
Thai Fatty Alcohols Co., Ltd.	Manufacturing and distributing oleochemicals	Thailand	72.29
Thai Pet Resin Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	74.00
PL Global Transport Co., Ltd.	Transportation of polyethylene plastic pellets	Thailand	100.00
NPC S&E Security Guard Co., Ltd.	Providing security services	Thailand	100.00
GC Logistics Solutions (Vietnam) Co., Ltd.	Transportation, warehouse and bagging packing management of polyethylene plastic pellets	Vietnam	100.00
GC Ventures America Corporation	Invest in form of Corporate Venture Capital (CVC) outside Thailand	United States of America	100.00
GCM Polymer Trading DMCC	Distributing polymer products and other polymers-related products	United Arab Emirates	100.00
GC Marketing Solutions Myanmar Co., Ltd.	Distributing polymer products and other polymers-related products	Myanmar	100.00
GC Marketing Solutions Vietnam Co., Ltd.	Distributing polymer products and other polymers-related products	Vietnam	100.00
PT GCM Marketing Solutions Indonesia	Distributing polymer products and other polymers-related products	Indonesia	67.00
PTTGC America LLC	Operating petrochemical business	United States of America	100.00
PTTGC Innovation America Corporation	Research and development of bio-based chemicals	United States of America	100.00
PTTGC International (Netherlands) B.V.	Holding and operating international business	Netherlands	100.00
GC International Corporation (formerly PTTGC International (USA) Inc.)	Holding and operating international business	United States of America	100.00
Vencorex Holding	Manufacturing and distributing chemical specialties	France	90.82
<i>Direct joint ventures</i>			
PTT Asahi Chemical Co., Ltd.	Manufacturing and distributing petrochemicals products	Thailand	50.00
PTT MCC Biochem Co., Ltd.	Manufacturing and distributing bioplastics products	Thailand	50.00
HMC Polymers Co., Ltd.	Manufacturing and distribution of polypropylene	Thailand	41.44
<i>Indirect joint ventures</i>			
Thai Ethoxylate Co., Ltd.	Wholesale distribution of chemicals and allied products	Thailand	36.15
Emery Oleochemicals (M) Sdn. Bhd.	Manufacturing and distributing oleochemicals	Malaysia	50.00

Name of Entity	Principal Activities	Country of Incorporation	Effective Equity Interest (%)
Emery Specialty Chemicals Sdn. Bhd.	Manufacturing and distributing oleochemicals	Malaysia	50.00
NatureWorks LLC	Manufacturing and distributing bioplastics products	United States of America	50.00
GGC KTIS Bioindustrial Company Limited	Manufacturing biofuels, biochemical and bioplastics	Thailand	50.00
Revolve Group Limited	Manufacturing and distributing polymer	United Kingdom	49.00
<b>Direct Associates</b>			
Global Power Synergy Plc.	Generating and distributing electricity, steam and processed water	Thailand	22.73
Kuraray GC Advanced Materials Co., Ltd.	Manufacturing advanced plastics	Thailand	33.40
PTT Energy Solutions Co., Ltd.	Providing technical engineering consulting services	Thailand	20.00
PTT Digital Solutions Co., Ltd.	Providing information and communication technology services	Thailand	40.00
Vinythai Plc.	Manufacturing and distributing petrochemical products	Thailand	24.98
Eastern Fluid Transport Co., Ltd. (15% Direct interest and 7.65% Indirect interest)	Administrating pipeline transportation system for petrochemical products	Thailand	22.65
<b>Indirect Associates</b>			
DynaChisso Thai Co., Ltd.	Manufacturing and distribution of polypropylene (PP) compound Resin	Thailand	41.50
Thai Eastern Top Seeds Oil Co., Ltd.	Manufacturing and distributing crude palm kernel oil	Thailand	21.69
S.P.Petpack Inter Group Co., Ltd.	Developing plastic packaging market in Myanmar	Thailand	25.00
<b>Others</b>			
Business Services Alliance Co., Ltd (25% Direct interest and 15.68% Indirect interest)	Providing recruitment and contractor procurement services to PTT Group	Thailand	40.68
Pracharath Rak Samakkee Rayong (Social Enterprise) Co., Ltd.	Providing consulting service on management	Thailand	50.00
Sarn Palung Social Enterprise Co., Ltd. (15% Direct interest and 2.27% Indirect interest)	Manufacturing and distributing products and/or services for social, community and environment benefits	Thailand	17.27
TPBI & Myanmar Star Co., Ltd.	Manufacturing and distributing plastics in Myanmar	Myanmar	10.00

From 14 partners and 10 joint venture companies in 2011, we expect to have 31 partners and 25 joint venture companies by 2022.

## DESCRIPTION OF THE TREASURY CENTER

The Treasury Center was incorporated on December 19, 2017 as a limited liability company in Thailand with a registered and paid-up capital of THB10,000,000. Its registered office is at 555/1 Energy Complex, Building A, 17th Floor Vibhavadi-Rangsit Road Chatuchak, Chatuchak, Bangkok, Thailand. The Treasury Center is a direct wholly-owned subsidiary of the Company and its financial statements will be consolidated with the Company. No part of the equity securities of the Treasury Center is listed or dealt in on any stock exchange and no listing or permission to deal in such securities is being or is proposed to be sought.

On February 14, 2018, the Treasury Center received a treasury center license from the Ministry of Finance allowing it to operate corporate treasury center business under the supervision of the Ministry of Finance and the Bank of Thailand. On April 19, 2018, the Treasury Center also qualified as an “international headquarters” for the Company, pursuant to the rules and regulations of the Revenue Department of Thailand, and received the International Headquarters License (“**IHQ License**”) from the Revenue Department of Thailand.

On June 1, 2019, pursuant to regulatory changes from the Revenue Department of Thailand, the Treasury Center replaced its IHQ license with an International Business Center License (“**IBC License**”), which confers certain tax privileges.

As a corporate treasury center, the Treasury Center aims to perform the cash and liquidity management and foreign exchange risk management activities for the Group, including through liability management transactions. As the “international business center” of the Group, the Treasury Center’s functions include providing financial management services and managerial and support services to the Group.

The Treasury Center’s Articles of Association provide that the board of directors is to be elected by shareholders. The Treasury Center’s Board of Directors is comprised of four members and together with our senior management team, is responsible for the management of the Treasury Center’s business.

<b>Name</b>	<b>Position</b>
Miss Pattaralada Sa-Ngasang	Chairman
Mr. Saroj Putthammawong	Director
Miss Kanoknun Buranapunsri	Director
Miss Pornsook Limsathit	Managing Director

The Treasury Center is not restricted from incurring any financial indebtedness.



## BUSINESS

### Overview

We are Thailand's largest ethane cracker and integrated petrochemical and petroleum refining company. Moreover, we are the second largest in Southeast Asia measured by nameplate capacity, with a distillation intake capacity of 280,000 barrels per day of crude oil and condensate and a combined petrochemicals nameplate capacity of 11.65 million metric tons per year as of December 31, 2020. We have an integrated refinery and petrochemicals platform covering the major components within the petrochemical and petroleum value chain, including the production of petroleum refinery, aromatics and olefins products and their downstream and derivative products. We are the principal petrochemical and chemical company within the PTT Group. We have a strong relationship with PTT, who is our major shareholder as well as our principal feedstock supplier and our principal offtake customer for our refining and petrochemical products. We also sell our petrochemical products to other customers both domestically and internationally.

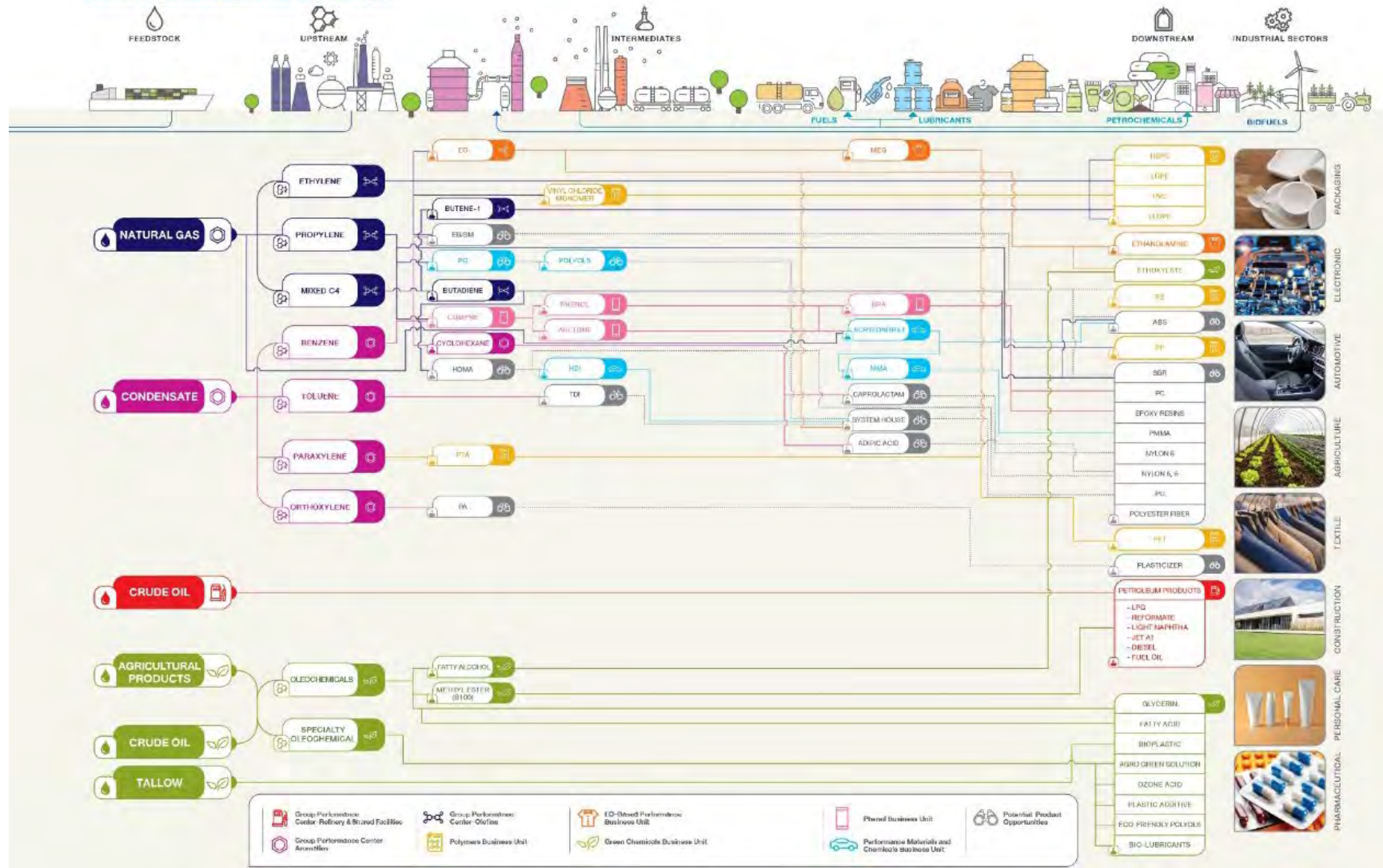
The majority of our plants are located in the Map Ta Phut Industrial Complex in Rayong, Thailand. We operate a refinery, two aromatics plants and four olefins plants, in addition to other plants producing polymers and other petrochemical products. We own or have acquired the rights to use a pipeline transmission system in and near the Map Ta Phut Industrial Complex through which we deliver our refining, aromatics, olefins and other products in liquid form to our offtakers and our suppliers deliver feedstock to us. We take and make deliveries of substantially all our feedstock and our products sold domestically through our pipeline network, as a substantial majority of our customers' and suppliers' plants are also located in or near the Map Ta Phut Industrial Complex.

We are organized into eight core business units: refinery, aromatics, olefins, polymers, EO-based performance, green chemicals, phenol and performance materials and chemicals. Our main business involves petroleum refining and supply of petroleum products such as diesel, jet A1 and fuel oil from our refinery, as well as the production and distribution of aromatics products, consisting mainly of benzene and paraxylene, and olefins products, comprising ethylene, propylene and olefins by-products such as mixed C4, cracker bottom and tail gas. We also produce and distribute polymer products, using feedstock from our olefins production. In addition, we produce and distribute EO-based performance products, including MEG and ethanolamines. Through our subsidiaries and partnerships formed with joint venture partners, we also produce and distribute green chemicals and performance materials and chemicals. Our performance materials and chemicals business unit includes the production of propylene oxide and polyols, which is the extended chain of propylene for producing polyurethane. In addition, we produce phenols, such as phenol, acetone and bisphenol A, which are used as feedstock in the production of downstream products such as engineering plastics. Apart from our eight core business units, we also engage in auxiliary businesses, including the provision of electricity, industrial water, steam and other utilities as well as the operation of production support facilities such as jetty and buffer tank farm services for plants in the Map Ta Phut Industrial Complex.

In December 2018, we acquired a 74% interest in GC-M PTA, a purified terephthalic acid producer, and a 74% interest in Thai PET Resin Company Limited, a polyethylene terephthalate resin producer, directly and indirectly, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. In March 2019, we acquired a 49% interest in Revolve Group Limited, a rotomolding compound producer with a significant market share in Europe and Oceania. In July 2020, we acquired a 41.5% interest in DynaChisso Thai Company Limited, a polypropylene ("PP") compound resin producer. These transactions benefit us by affirming our position as the PTT Group's petrochemical flagship, as these transactions create synergies in our existing business and provide opportunities for us to further expand our business into downstream products and high-value products, thereby enhancing our potential in accessing and competing in high-growth markets.

The following flowchart illustrates our petroleum refining and petrochemical products, including the principal feedstock inputs we purchase, the products we produce under each business unit, the integration of production and exchange streams across our business units as well as potential product opportunities arising from the integration of our production capabilities.

# Business Value Chain



For the year ended December 31, 2020, we reported total revenues from sales of goods and rendering of services of THB329,291.2 million (US\$10,972.7 million).

The following tables set forth the revenue from sales of goods and rendering of services and revenue contribution as a percentage of total revenue from sales of goods and rendering of services by business segment for the year ended December 31, 2020 before inter-segment elimination.

Business segment	Revenue for year ended December 31, 2020		Revenue contribution as percentage of our total revenue for year ended December 31, 2020
	THB	US\$	%
	(in millions)		
Refinery .....	150,092.2	5,001.4	45.6%
Aromatics.....	76,994.9	2,565.6	23.4%
Olefins and Derivatives .....	115,787.0	3,858.3	35.2%
Green Chemicals* .....	18,202.5	606.5	5.5%
Performance Materials and Chemicals** .....	34,112.4	1,136.7	10.4%
Services and Others*** .....	8,454.7	281.7	2.6%
Inter-segment Eliminations .....	(74,352.4)	(2,477.6)	(22.6)%
<b>Total.....</b>	<b>329,291.2</b>	<b>10,972.7</b>	<b>100.0%</b>

Notes:

\*A portion of our polymers, green chemical and performance materials and chemicals products are produced and distributed by our joint venture partners. For further details, see “—Our Business Segments and Products—Polymers,” “—Our Business Segments and Products—Green Chemicals” and “—Our Business Segments and Products—Performance Materials and Chemicals.”

\*\*Performance materials and chemicals products include phenol. For further details, see “—Our Business Units and Products—Performance Materials and Chemicals.”

\*\*\*We operate a range of business services for our subsidiaries and associated companies and customers in the petrochemical industry and derive service fees from third party industrial customers. See “—Our Business Units and Products—Services and Others” for further details.

The following table sets forth ADJUSTED EBITDA, ADJUSTED EBITDA margin and ADJUSTED EBITDA contribution as a percentage of total ADJUSTED EBITDA by business segment for the year ended December 31, 2020.

Business segment	ADJUSTED EBITDA <sup>(1)</sup> for year ended December 31, 2020	ADJUSTED EBITDA <sup>(1)</sup> for year ended December 31, 2020	ADJUSTED EBITDA margin <sup>(2)</sup> for year ended December 31, 2020	ADJUSTED EBITDA contribution as a percentage of total ADJUSTED EBITDA for year ended December 31, 2020
	(in millions of THB)	(in millions of US\$)		
Refinery.....	(4,072.5)	(135.7)	(2.7)%	(20.1)%
Aromatics .....	1,563.0	52.1	2.0%	7.7%
Olefins and Derivatives* .....	15,064.8	502.0	13.0%	74.2%
Green Chemicals .....	1,244.0	41.5	6.8%	6.1%
Performance Materials and Chemicals** .....	6,019.6	200.6	17.6%	29.7%
Services and Others*** .....	1,736.6	57.9	20.5%	8.6%
Inter-segment Eliminations .....	(1,265.0)	(42.2)	1.7%	(6.2)%
<b>Total .....</b>	<b>20,290.5</b>	<b>676.1</b>	<b>6.2%</b>	<b>100.0%</b>

Notes:

(1) ADJUSTED EBITDA means profit for the year excluding income tax expense, finance costs (less investment income), share of profit of investments in joint ventures, share of profit of investments in associates, depreciation and amortization and others.

(2) ADJUSTED EBITDA margin means ADJUSTED EBITDA divided by the sum of revenue from sale of goods and revenue from rendering of services.

\* Derivatives include polymers and EO-based performance products and the PTA and PET businesses.

\*\* Performance materials and chemicals products, including Phenol. For further details, see “—Our Business Units and Products—Performance Materials and Chemicals.”

\*\*\* We operate a range of business services for our subsidiaries and associated companies and customers in the petrochemical industry and derive service fees from third party industrial customers. See “—Our Business Units and Products—Services and Others” for further details.

The following table sets forth ADJUSTED EBITDA margin by business segment for the years ended December 31, 2018, 2019 and 2020.

Business segment	ADJUSTED EBITDA margin <sup>(1)</sup> for the year ended December 31,		
	2018	2019	2020
Refinery.....	3.2%	2.2%	(2.7)%
Aromatics .....	3.9%	1.0%	2.0%
Olefins and Derivatives* .....	23.7%	12.0%	13.0%
Green Chemicals .....	5.3%	4.6%	6.8%
Performance Materials and Chemicals** .....	14.9%	9.6%	17.6%
Services and Others*** .....	22.1%	15.9%	20.5%
Inter-segment Eliminations .....	(0.3%)	0.0%	1.7%
<b>Total .....</b>	<b>11.2%</b>	<b>6.7%</b>	<b>6.2%</b>

Notes:

(1) ADJUSTED EBITDA margin means ADJUSTED EBITDA divided by the sum of revenue from sale of goods and revenue from rendering of services.

\* Derivatives include polymers and EO-based performance products and the PTA and PET businesses.

\*\* Performance materials and chemicals products, including Phenol. For further details, see “—Our Business Units and Products—Performance Materials and Chemicals.”

\*\*\* We operate a range of business services for our subsidiaries and associated companies and customers in the petrochemical industry and derive service fees from third party industrial customers. See “—Our Business Units and Products—Services and Others” for further details.

The following table sets forth the nameplate capacity by business segment (excluding services and others) as of December 31, 2020.

Business segment	Nameplate capacity (metric tons/year, unless otherwise specified)
Refinery.....	280,000*
Aromatics .....	2,419,000
Olefins and Derivatives	
Olefins.....	2,988,000
Polymers**.....	3,279,000
EO-based performance products** .....	473,000
Green Chemicals** .....	931,000
Performance Materials and Chemicals** .....	606,000
Phenol .....	954,000

Notes:

\* Refers to distillation intake capacity as measured in barrels per day. Includes the sum of our intake capacities for our crude distillation unit (145,000 barrels per day) and condensate splitter (135,000 barrels per day).

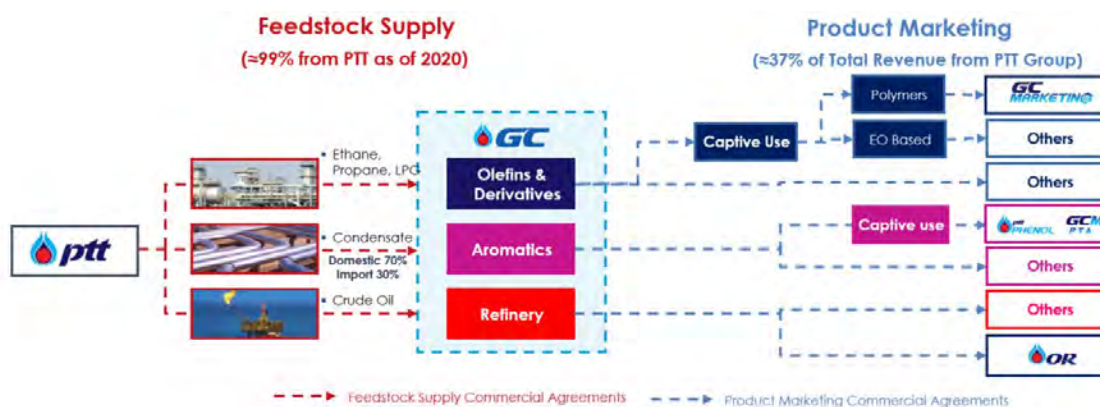
\*\* A portion of our polymers, green chemical and performance materials and chemicals is produced and distributed by our joint venture partners. Nameplate capacities for these business segments are based on our equity shareholdings in such joint venture partnerships.

## Competitive Strengths

We have the following competitive strengths:

- **Strategic Relationship with PTT.** Our major shareholder, PTT, is the largest supplier of petroleum and natural gas in Thailand by market share and revenue. We benefit from our relationship with PTT, which is majority-owned by the Government, in a number of important respects. We are the principal petrochemical and chemical company for the PTT Group, which allows PTT to capture downstream production value from its natural gas resources. Our strategic relationship with PTT allows us to benefit from PTT’s market position, expertise and customer base. PTT’s position as our principal feedstock supplier and principal offtake customer provides important stability to our business as discussed further below. Our membership within the PTT Group, which is involved in major areas of the natural gas, petroleum and petrochemical businesses in Thailand, also provides us with significant economies of scale, discounts through bulk purchases, business opportunities and group synergies.

The chart below illustrates our strategic relationship with PTT covering feedstock supply and product marketing.



- Secure Feedstock Position and Offtake Arrangements.** We have entered into long-term arrangements with PTT and, to a lesser extent, other parties for both supply of our feedstock and offtake of our products. We purchase a significant portion of our feedstock from PTT pursuant to arm's length, long-term supply agreements that are generally renewable on an evergreen basis, subject to availability of supply. We believe this provides us with secure access to feedstock at attractive pricing arrangements. In addition, our ability to internally source feedstock and capture value throughout the integrated production chain allows us to reduce fluctuations to our operating margins. Similarly, we sell a significant amount of our products from our key business units, except EO-based performance and polymer products, to PTT and other customers pursuant to long-term arrangements. Notwithstanding the fluctuations in the prices that we pay for our feedstock and the prices at which we sell our products, we have contractually secured most of our product intake and output for our existing production plants, which provides important stability to our business.
- Cost Competitiveness from Feedstock Supply.** We believe that we benefit from attractive pricing under our long-term feedstock agreements with PTT, particularly with respect to our ethane feedstock arrangements. We purchase ethane feedstock from PTT on a profit-sharing basis, which is aimed at guaranteeing an equitable return on each party's respective investment, taking into account PTT's investment in its gas separation plant and our investment in the production of olefins and olefin derivatives. PTT collects a margin on our olefins and olefin derivatives sales based on a pricing formula that references polyethylene benchmark prices and also takes into account gas prices, Dubai crude oil prices, investment costs, exploration and production costs, plant processing costs and other fixed overhead costs incurred by PTT. We believe that this profit-sharing arrangement substantially reduces the extent of volatility of our cash flows and operating margins compared to benchmark pricing. According to IHS Markit, we are located in the second quartile of the cost curve for global ethylene producers.
- Integration Across the Refining and Petrochemicals Value Chain.** We operate an integrated refinery and petrochemicals platform. Our production covers and links the major components within the carbon value chain, including the production of refinery, aromatics and olefins products and their downstream derivative products. During the year ended December 31, 2020, we used over 6.8 million metric tons of our intermediate products, by-products, condensate residue and naphtha for the production of finished products. Our plants have the ability to process a variety of crude, condensate and natural gas feedstock (subject to our plants' specifications), reducing our dependence on any given type of crude, condensate or natural gas feedstock. This allows us to achieve efficient production, reducing both logistics costs and product wastage throughout the production chain. Through the integration of our refinery and petrochemical platforms, we are able to convert approximately 26% of our crude and condensate intake volume into petrochemical products, and expect this figure to increase to approximately 31% upon the completion of the olefins reconfiguration project.

We are the only ethane-based petrochemical producer in Thailand, with a competitive cost structure. We also benefit from our ability to produce higher value-added petrochemical products instead of selling those products in their intermediate stage at lower margins to the market. For example, we are able to utilize the ethylene generated in our olefins crackers to produce polymers-based products,

such as HDPE, LDPE, LLDPE, and EO-based performance products, which deliver higher sales margins for us compared to the direct sale of ethylene. According to IHS Markit, we are the only producer of phenol, EO and MEG, the largest producer of benzene, paraxylene, ethylene, LDPE and the second largest producer of propylene, HDPE, LLDPE and bis-phenol A in Thailand based on nameplate capacity as of December 31, 2020.

- ***Diversified Portfolio of Businesses and Products.*** We benefit from a diversified portfolio of petrochemical businesses and products. We have eight business units producing a broad range of petrochemical and refined products and as of December 31, 2020, our global footprint includes six marketing offices located in China (Shanghai and Guangzhou), Dubai, Indonesia, Vietnam and Myanmar as well as 12 operating sites located across the United States, Europe (France, Germany, Poland and the UK), Malaysia, Australia and New Zealand. We believe we have a strong product mix to take advantage of the potential for higher margins throughout the value chain. For example, in addition to our refinery business, we also manufacture and distribute aromatics and olefins products and other downstream derivative products, including polymers, EO-based performance products. In addition to consolidating our leading positions in our existing portfolio of petrochemical products, we are investing in performance materials and chemicals and green chemicals, which we believe have the potential to increase our margins. We believe our diversification enables us to reduce our dependence on any one product. This allows us to reduce earnings volatility and increase operating margins. In addition, with our proximity to growth markets in Southeast Asia and our export facility, we benefit from exporting our products to Southeast Asia, China, and other countries. For the year ended December 31, 2020, 63.6% of total revenue was derived from Thailand while 11.0%, 12.1% and 13.3% was derived from China, Southeast Asia and other countries, respectively and for the year ended December 31, 2019, 63.2% of total revenue was derived from Thailand while 10.4%, 13.8% and 12.6% was derived from China, Southeast Asia and other countries, respectively.
- ***Proximity to Suppliers and Customers.*** Our plants are located within the Map Ta Phut Industrial Complex, Thailand's major petrochemical production area. This strategic location provides us with key competitive advantages as it puts us in close proximity with a number of our key suppliers and customers. We transport a substantial portion of our products along pipelines that we either own or have acquired rights to use in the Map Ta Phut Industrial Complex. This allows us to minimize feedstock and product transportation costs, enabling us to receive feedstock from our suppliers and deliver end-products to our customers in a timely and cost-effective manner.
- ***Highly Experienced Management Team.*** Our senior management team is highly experienced and has a proven track record in the refinery and petrochemical related industries. Our chairman and most senior members of our executive management, Mr. Piyasvasti Amranand, Mr. Kongkrapan Intarajang, Mr. Patiparn Sukornthaman and Ms. Pattaralada Sa-NGasang, have extensive experience in the Thai refinery and petrochemical related industries and within the PTT Group.

## Strategy

Our goal is to maintain our competitiveness as a leading global petrochemical and chemical producer and to grow our business in a sustainable manner in order to support our future growth plans. Following the onset of the COVID-19 pandemic, we analyzed various trends and established a new strategic framework anchored on four primary strategic pillars in order to build and maintain competitiveness, promote sustainable business growth and ensure readiness for future uncertainties. We expect our combined petrochemical capacity to increase from 11.65 metric tons per year to 12.68 metric tons per year by 2022. For future growth, our strategy is anchored on the implementation of four pillars as follows: (i) Step Change; (ii) Step Out; (3) Step Up; and (4) Transformation.

- ***Step Change: Enhance competitiveness by generating value from existing products and assets, develop operational synergies and expanding market reach.*** We strive to add value to our existing petrochemical products and assets. We intend to achieve this through strategic investments in our product value chain, which will support our growth in the downstream industry. By investing in our plants and infrastructure, we will be able to accommodate a larger variety of feedstock, thereby helping ensure our long-term feedstock security. We also seek to enhance our competitiveness by improving our operational efficiency in production, marketing and distribution through the MAX Infinity project within each business unit. In addition, through the Map Ta Phut (“MTP”) Integration project, we plan to integrate the supply chain of our Map Ta Phut plants, from feedstock sourcing to product delivery, to help reduce production costs, prevent losses and add value to our products. To complement the MTP Integration Project, we are undertaking an organizational and digital transformation to streamline operations.

In addition, we are implementing market-focused business strategies, placing emphasis on high value products (“HVP”) such as flexible packaging, caps and closures, rotomolding and pipes, and diverse applications to better meet the needs of the market and end-users, while also fostering product development collaborations with partners across the value chain, developing markets for existing products, and generating demand among new customers.

We also work with partners under the Eastern Economic Corridor (“EEC”) project, a special economic zone of three provinces in eastern Thailand, and plan to invest an additional THB28 million from 2021 to 2025 in the EEC to bolster the competitiveness of the domestic petrochemical industry, establish regional market connectivity and strengthen investor confidence. Outside of the EEC and in line with our policy to promote the bioeconomy for sustainable development, we plan to invest in bio-industrial projects amounting to over THB25.5 billion in the next five years. Expanding our home base beyond Thailand and into the wider Southeast Asian market will enable us to foster long-term distribution security in high-growth markets such as Indonesia and Vietnam. We will also start establishing marketing and sales teams overseas while seeking investment opportunities.

- ***Step Out: Capture new growth opportunities and become a global player by focusing on high value businesses and continued collaboration with the PTT Group.*** We aspire to become a world-class, leading petrochemical company by building an international production base, to meet demand in the domestic market, the Southeast Asian markets and beyond, that will give us a competitive edge in feedstock cost and bolster our growth rate in the face of challenges posed by emerging technologies. As part of this initiative, for example, PTTGC America LLC is conducting a feasibility study in relation to the potential development of a petrochemical production facility in Ohio, U.S. to produce ethylene and polyethylene products. We aspire to increase the percentage of profit contribution from the international market from 7% in 2020 to 30% by 2030. We will seek new business opportunities by utilizing corporate venture capital (CVC) to enter into new businesses with expertise in outstanding technologies and innovations, to further strengthen and expand our existing businesses.

As demonstrated in our recent investments, we also place importance on acquisitions and joint venture partnerships that provide us with the know-how, technology and expertise to offer products that meet our customers’ needs, match global trends and expand our markets geographically, and we continually review opportunities for strategic growth through value-enhancing acquisitions, investment and joint venture partnerships that we may enter into from time to time. Investment in high value businesses (HVB) also form part of our strategic considerations. At the same time we continue to evaluate our current investments and portfolio of assets with a view to potential restructurings and/or sales of non-core assets from time to time, in order to streamline our operations as our part of our growth strategy. For example, in July 2020, we acquired a 41.5% interest in DynaChisso Thai Company Limited, a polypropylene compound resin producer. These transactions create synergies in our existing business and provide opportunities for us to further expand our business into downstream products and high-value products, thereby enhancing our potential in accessing and competing in high-growth markets. We aspire to increase the percentage of profit contribution from performance chemicals and green chemicals from 10% in 2020 to 25% by 2030 and we expect to realize an increase in volume growth by 10% in 2021 from the ORP Project new naphtha cracker, the GC Oxirane plant and the GC Polyols plant. We plan to implement market-focused business strategies, emphasizing high-value products and diverse applications to better meet the needs of the market and end-users, while also fostering product development collaborations with partners across the value chain, developing markets of our existing products and generating demand among new customers.

We are also focused on leveraging our strategic role within the PTT Group and building on our strong and long-standing relationships with PTT and its subsidiaries. We are exploring new ways to enhance our collaboration with the PTT Group, including the use of a co-investment model, which we believe will enable us to share costs and generate returns on investment.

- ***Step Up: Promote business sustainability by leading the way in environmental conservation initiatives and reducing greenhouse gas emissions, in line with the principles of the Circular Economy.*** We view the global trend towards bio-based, renewable and environmentally-friendly operations and products as an opportunity to invest in technologies and research and development that promote the “circular economy” and help reduce greenhouse gas emissions. We aim to reduce our greenhouse gas emissions by 20% by 2030.

In line with the principles of “circular economy,” we strive to keep resources in use for as long as possible and extract the maximum value from them while in use. We aim to achieve maximum circulation of resources in our production processes through the GC Circular Living project, specifically through the consumption of renewable resources, process optimization and waste management. In promoting bioeconomic and sustainable development, we value innovations in product design and development that reduce the environmental footprint of our operations, enhance our public waste management and promote the “circular economy.” One of our key approaches is to reduce single-use plastic production and promote compostable plastics. We strive to increase the number of carbon footprint reduction labeling on our products. We also plan to increase the volume of recycled plastic products.

We have also established climate change management guidelines focused on the use of renewable resources, product efficiency enhancement through technology and digital systems as well as energy management and sustainable water management, to enable us to progressively reduce energy consumption, greenhouse gas emissions and the risk of water crises. Our CSR program is focused on activities that reflect the value of collaboration with all stakeholders by working closely with community and social development organizations to establish sustainable business practices.

- ***Transformation: Pursuing organizational and digital transformation initiatives to improve operational efficiency, agility and adaptability.***

In parallel with Step Change, Step Out and Step Up, we are undertaking an organizational and digital transformation project called the FiT Project. We aim to adjust our operations to improve efficiency, agility and adaptability by streamlining our organizational structure and implementing a digital transformation plan. Within our organizational structure, we seek to retain the optimum number of employees with the necessary competencies to improve efficiency and strengthen our corporate culture emphasizing the “GC Spirit Four Core Behaviors”: (i) take initiative to create better results; (ii) keep improving the self and inspiring teamwork; (iii) work proactively to serve customers’ needs; and (iv) strive for the greater good.

As part of our digital transformation strategy, we are focused on making adjustments to end-to-end processes through digitization and a data-driven approach to reduce costs, improve operational efficiency, enhance system effectiveness, boost agility and decrease risks.

## **Recent Developments**

### ***COVID-19***

The COVID-19 pandemic has resulted in a global economic downturn of unknown duration and has caused increased volatility in and intermittent disruptions to the global financial and credit markets. The outbreak has directly resulted in a significant decrease in demand for petroleum and petrochemical products in 2020. Future disruptions to the global financial and credit markets from the COVID-19 pandemic and related economic impacts could, both directly and indirectly, negatively impact our financial condition and results of operations.

Since the beginning of the spread of COVID-19 in 2020, we have taken numerous measures to protect our staff, our operations, and our business performance from the pandemic. We launched a COVID-19 prevention guideline for all staffs and operators in our head office, all operation sites, and all subsidiaries’ areas.

In addition to our employees’ cooperation in wearing masks, we provide alcohol hand sanitizer in all our premises, allow work-from-home arrangements, instituted enhanced protection measures such as self-screening and daily reporting system, temperature checks, physical distancing, and released a regulation not to permit an employee to travel to or transit at high risk countries and/or areas. We have accelerated our digitalization program, providing secure IT services and support to facilitate remote work .We also applied the “Lock-up program” in sensitive operation areas, such as control room, to ensure that our operation areas will be safe and our businesses will not be interrupted. We have also shared our COVID-19 response plan with our customers and suppliers, and timely communicate updates to employees and other relevant parties.

In addition, as COVID-19 has substantially affected the demand for refined products, especially demand for jet fuel, which sharply declined as all parts of the world applied their respective lockdown measures, PTTGC, with our production flexibility, has turned our production of jet fuel into diesel. Demand for diesel from the transportation sector has continued, and this has helped to mitigate the impact of the pandemic on our Refinery business. Furthermore, we have adjusted our production and sales strategies to match customer’s needs, resulting



in just a slight drop in sales volume in 2020 compared with the previous year. In terms of liquidity, we ensured our liquidity preparedness during the difficult year by issuing THB15 billion bond in April 2020, securing bank loan facilities totalling THB30 billion, and obtaining shareholder approval at the AGM for the issuances of the aggregate amount of US\$4 billion in the next five years (2020-2024). We also implemented certain cost saving strategies and enhancements resulting in savings of approximately THB4,500 million in operating expenses (including the impact of TFRS16).

Additionally, we have provided support to local communities through providing personal protective equipment and other medical supplies. As of January 15, 2021, we have produced (i) 203,570 single use disposable gowns made with our InnoPlus PE products distributed to 181 hospitals and government agencies nationwide; (ii) 94,500 face shields using HDPE (PET sheets); (iii) 500 sets of medical protective suits with air-purifying respirators; (iv) 600 pairs of shoe covers; (v) 26 tons of plastic film for COVID-19 prevention applications and provided to 900 hospitals in 77 provinces across Thailand; (vi) 13 CoviClear nanosilver disinfection units; (vii) 300 red bins and 35,000 red bags made of InnoPlus plastic for infectious waste; and, (viii) in collaboration with Thai Bev, we produced 74,636 liters of alcohol gel sanitizers made from the refined glycerin which is one of essential ingredients under the Green Health Project of Global Green Chemical PLC.

We believe that we are following best practices under COVID-19 guidance and intend to continue to refine our practices as additional guidance is released and assess potential impacts from COVID-19 to our financial position and operating results, as well as any regulatory and legislative activities relating to COVID-19 that could impact our business. We are unable to predict, in light of the ongoing and dynamic nature of the circumstances related to COVID-19 and the continued growth in COVID-19 infections globally, any additional impact the outbreak may have on our business, results of operations and financial condition. The extent of COVID-19's impact on us will depend on future developments, which are highly uncertain and cannot be predicted with any reasonable degree of certainty, including new information which may emerge concerning the severity of COVID-19, the duration of the outbreak, spikes in infection rates (including in our areas of operation) and related economic effects and after effects (including on the gas, oil and chemicals industry), and actions taken to contain COVID-19 or its impact, including vaccine acceptance, distribution and effectiveness, among others. For further information regarding the potential impact of COVID-19, see "*Risk Factors—Risks Related to the Business—The outbreak of COVID-19 (or any future pandemic), and related declines in economic output and demand for our products, could harm our business, results of operations and financial condition.*"

## **Our Business Units and Products**

### ***Refinery***

We own and operate an advanced refinery in the Map Ta Phut Industrial Estate. We believe our refinery is one of the most complex refineries in Southeast Asia, with an average complexity of 10.2 based on our internal estimates using the methodology of the Nelson Complexity Index (an index used in the refining industry to measure the complexity of a refinery). Our refinery's configuration allows us to process heavier, less expensive crude oil compared to competitors with less complex plants, while still producing high-value, clean fuels. The configuration is oriented towards maximizing middle distillates (hydrocracking) and re-directing reformate to produce aromatics products at two of our aromatics complex. We have the ability to make high quality refined products. Generally, as the feedstock slate is more complex and flexible, the refinery is better positioned to take advantage of the more cost effective crude oils, resulting in incremental gross margin opportunities for the refinery.

Our refinery produces a range of refined products, including:

- light distillates, consisting of LPG, light naphtha and reformate;
- middle distillates, consisting of jet fuel and diesel; and
- heavy distillates, consisting of fuel oil.

We transport a substantial portion of our refined products along pipelines that we either own or have acquired rights to use in the Map Ta Phut Industrial Estate. We believe pipeline freight is a relatively faster and more economical mode of transport compared to rail or road transportation, allowing us to reduce transportation costs and lead-times with respect to delivery of our products to customers.

### *Refinery — Intake Capacity and Capacity Utilization Rates*

Our refinery is capable of distilling crude oil into various intermediate and downstream products, including feedstock for delivery to our other business units. Our refinery had a total intake capacity of 145,000 barrels of crude oil feed per day as of December 31, 2020. We also operate two condensate splitter units in our aromatics plants that produce condensate residue which we use as feedstock for the production of our refined products. Our condensate splitter units located in the aromatics plants have a combined intake capacity of 135,000 barrels per day of condensate feed as of December 31, 2020. Our combined distillation intake capacity of 280,000 barrels per day accounts for approximately 23% of Thailand's total refining capacity .

We measure the utilization of our refinery, or crude distillation rate, based on crude input divided by its intake capacity. See “*Management’s Discussion and Analysis of Financial Condition and Results of Operations—Key Metrics by which We Measure Our Business—Key Metrics for Our Refinery Business Unit—Crude Distillation Rate*” for more details on the crude distillation rate. In any given year, our crude distillation rate may exceed 100% as a result of efficiency and operational improvements, while operational disruptions and shutdowns, both planned and unplanned, may result in a reduction in our capacity utilization rate.

For the year ended December 31, 2020, our crude distillation rate was 97%, compared with 87% for the year ended December 31, 2019. The increase in our crude distillation in 2020 was due to a scheduled maintenance shutdown of the refinery.

We also own a jetty and petrochemical tank farm to provide production security in the event of breakdowns in production processes and maintenance turnarounds. These facilities also act as a holding area for imported and exported petrochemical products used in the production of our other intermediate and downstream products.

### *Refinery — Feedstock*

The principal feedstock used in our refinery is crude oil. We purchased approximately 50 million barrels of crude oil for the year ended December 31, 2020.

We procure substantially all of our crude oil feedstock from the domestic market, the Middle East, Asia, West Africa and United State through our major shareholder, PTT. We utilize an optimization model to determine our crude feedstock mix from period to period, in order to optimize our sales and feedstock mix. We have a crude oil feedstock agreement with PTT expiring in 2024, pursuant to which PTT has agreed to supply crude oil and blend stock of the types and quantities designated by us for use in the production of our refined products. The agreement automatically renews itself on an evergreen basis after the expiration of the original term unless either party provides one year’s prior written notice to terminate. The price of the crude oil to be supplied by PTT to us under the agreement is based on a competitive market price for the feedstock at the time of purchase (typically benchmarked off Dubai crude oil prices), or, in cases where there is no relevant market price, on the parties’ agreed-upon value of the feedstock.

*In February 2021, we entered into an agreement with PTT for extension of payment credit terms of feedstock, including crude oil. This provides us with flexibility in working capital management as required.*

The majority of our refined products are sold domestically to PTT Oil and Retail Business Public Company Limited (“**PTTOR**”). We also sell our refined products internationally.

We have two principal refinery offtake agreements with PTTOR. The first agreement is an 18-year offtake agreement which expires in 2024, subject to automatic renewals on an evergreen basis, with a minimum offtake requirement of 70% of the annual production amount of refined products from our crude distillation unit. The second agreement is for a 15-year term expiring in 2024, subject to automatic renewals on an evergreen basis, and contemplates an offtake of 100% of the annual production amount of refined products produced from our condensate residue splitters. The second agreement also requires that the offtake price for no less than 50% of the production amount be based on domestic market prices and the remaining 50% based on prevailing regional benchmark prices. Pricing under both agreements are to be re-negotiated between the parties on an annual basis, subject to general pricing guidelines. Either agreement may be terminated by either party after the original term by a notice of at least 12 months prior to the anniversary of the signing date of the respective agreement. Under these guidelines, the product prices for domestic sales are to reflect prices prevailing in Thailand for products of a similar quality that are sold in or imported to Thailand. For export sales, the product price reflects the prevailing

regional benchmark prices, typically the average of the mean of the Platts quotation under the heading “Singapore” (“MOPS”).

The following table sets forth the sales volume of our principal refined products for the year ended December 31, 2020.

<b>Refined product*</b>	<b>Production volume (Barrels)</b>	<b>Percentage of production volume</b>	<b>Sales volume (Barrels)</b>	<b>Percentage of sales volume</b>
Diesel .....	39,924,861	57.6%	39,692,534	67.8%
Fuel oil .....	6,660,014	9.6%	6,609,727	11.3%
Jet fuel .....	2,695,925	3.9%	2,230,933	3.8%
Reformate .....	7,338,385	10.6%	2,428,115	4.1%
Light naphtha.....	4,426,269	6.4%	1,959,684	3.3%
Others** .....	8,280,125	11.9%	5,665,710	9.7%
<b>Total.....</b>	<b>69,325,579</b>	<b>100.0%</b>	<b>58,586,703</b>	<b>100.0%</b>

Notes:

\* Production slate of each refined product may vary from period to period, subject to crude slate and process adjustment.

\*\* “Others” primarily includes LPG.

### **Aromatics**

We produce and distribute primary aromatics, comprising paraxylene, benzene, cyclohexane, orthoxylene, mixed xylenes and toluene, as feedstock for intermediate and downstream petrochemicals used to produce raw materials for electronic parts and automotive parts (in the case of benzene) and polyester and fiber resins (in the case of paraxylene), as well as a variety of other products. Our other aromatics products are used in various downstream petrochemicals applications, including the production of automotive parts, furniture, toys, household appliances, textiles, PET bottles, adhesives, laminate, pipe, paints, insecticides and glue.

We operate two aromatic units, Aromatics Complex I and Aromatics Complex II, with the technology of UOP LLC, a leading licensor of processing technology for the production of aromatics. Both plants allow feedstock and product exchange to optimize paraxylene and benzene production. The location of our refinery, aromatics and olefins units in the Map Ta Phut Industrial Complex allows us to integrate the productions from our plants efficiently. We also believe that our location has an important impact on our margins because we are able to gain access to feedstock from the Gulf of Thailand and take advantage of efficient distribution channels through local pipelines.

#### *Aromatics — Nameplate Capacity and Capacity Utilization Rates*

Our aromatics plants had a combined nameplate capacity of 2,419,000 metric tons of primary aromatics products per year as of December 31, 2020.

The following table sets forth details of the respective nameplate capacities and production volumes of our principal aromatics products for the year ended December 31, 2020.

<b>Aromatics product</b>	<b>Nameplate capacity (Metric tons/Year)</b>	<b>Production volume during the year ended December 31, 2020 (Metric tons)</b>
Paraxylene .....	1,310,000	1,102,614
Benzene .....	697,000	766,692
Cyclohexane .....	200,000	175,120
Orthoxylene .....	86,000	77,113
Mixed xylenes* .....	76,000	44,457
Toluene*.....	50,000	47,417
<b>Total.....</b>	<b>2,419,000</b>	<b>2,213,413</b>

\* Used as intermediates in aromatics production.

The two condensate splitter units in our aromatics plants produce mainly reformat which is used as feedstock for our aromatics products. Our condensate splitter units also produce condensate residue as a by-product, which we use as feedstock in our refinery for our refined products. See “—Our Business Units and Products—Refinery—Intake Capacity and Capacity Utilization Rates” for more details regarding the use of condensate residue from our condensate splitters in our refinery.

We measure the utilization of our aromatics plants based on our plants' combined realized output, divided by their nameplate capacity, or BTX utilization rate. See “*Management’s Discussion and Analysis of Financial Condition and Results of Operations—Key Metrics by which we Measure Our Business—Key Metrics for Our Aromatics Business Unit—BTX Utilization Rate*” for more details on the BTX utilization rate. Operational disruptions and shutdowns, both planned and unplanned, may result in a reduction in our capacity utilization rate. For the year ended December 31, 2020, our BTX utilization rate for our aromatics plants was 96%, compared with 88% for the year ended December 31, 2019.

#### *Aromatics — Feedstock*

The principal feedstock used in our aromatics plants is condensate and reformate. We purchase most of our condensate feedstock from PTT. PTT procured 70% of its condensate from the Gulf of Thailand and the remainder from other countries in Asia, including Malaysia, Indonesia, the Philippines and Australia, during the year ended December 31, 2020. As PTT sources the majority of its condensate domestically, PTT saves on import costs, and such cost saving is passed on to us. Our integrated plants enable us to receive reformate from our refinery. We purchased 44 million barrels of condensate from PTT combined with reformate internally transferred from our refinery for the year ended December 31, 2020.

We have a condensate feedstock agreement on an evergreen basis, pursuant to which PTT has agreed to supply us with a range of approximately 40 to 51 million barrels of condensate per year, depending on our offtake specifications. In case domestic condensate supply is not sufficient, imported condensate will be supplied by PTT to satisfy any shortfall. The agreement automatically renews itself on an evergreen basis after the expiration of the original term unless either party provides one year’s prior written notice to terminate it. The price of the condensate to be supplied by PTT to us under this feedstock agreement is based on the prevailing domestic price, or in the case of imported sources, imported condensate market price, plus freight costs. The market price typically reflects the weighted average price of different benchmark prices. Either we or PTT may request to revise the pricing formula by written notice to the other party, subsequent to which we will promptly meet to discuss and decide on any pricing adjustments.

Our aromatics plants also internally exchange feedstock. For instance, mixed xylenes produced from Aromatics Complex I are used as feedstock in Aromatics Complex II, whereas toluene produced from Aromatics Complex II is used as feedstock in Aromatics Complex I. Reformate from our refinery is used as feedstock in our Aromatics Complex I and Aromatics Complex II. Our aromatics plants also receive pyrolysis gasoline from our olefins plants.

#### *Aromatics — Sales*

We sell the majority of our aromatics products domestically, mainly to PTT as distributor for resales to end-users. We also export our aromatics products to other Asian countries, including Singapore, Taiwan, Indonesia, Malaysia, China and India, and to the Middle East and Europe, including Saudi Arabia, Kuwait and the Netherlands.

In addition to our main customer, PTT, the key domestic customers for our aromatics products include Indorama Petrochem Limited (“**IRPL**”), Ube Chemicals (Asia) Public Company Limited (“**UCHA**”), TPT Petrochemicals (Thailand) Public Company Limited (“**TPT**”), GC-M PTA and Continental Petrochemicals (Thailand) Company Limited (“**CPCT**”). The products sold for export are principally sold through PTT to end users.

The following table sets forth details of our material offtake agreements for our aromatics business as of December 31, 2020.

<b>Aromatics product</b>	<b>Party</b>	<b>Contract quantity (Metric tons/year)</b>	<b>Termination year</b>
Benzene.....	PTT	120,000 – 150,000	Evergreen ***
		240 – 720	Evergreen *
		0 – 203,000	Evergreen**
Paraxylene.....	TPT	250,000	Evergreen *
	TPT	50,000 – 60,000	Evergreen *
	TPT	0 – 20,000	Evergreen *
	TPT	80,000 – 100,000	Evergreen *
	IRPL	190,000 – 200,000	Evergreen *

<u>Aromatics product</u>	<u>Party</u>	<u>Contract quantity (Metric tons/year)</u>	<u>Termination year</u>
	GC-M PTA	120,000	Evergreen**
	GC-M PTA	10,000	Evergreen**
	GC-M PTA	250,000 – 270,000	Evergreen ***
	PTT	0 – 131,000	Evergreen**
Orthoxylene.....	CPCT	28,200 – 55,410	Evergreen**
Cyclohexane.....	UCHA	76,000 – 81,000	Evergreen**

Notes:

- \* These agreements are made on an evergreen basis and will continue to be in effect after the lapse of the applicable term, unless terminated by written notice of either party with six months to two years of advance notice.
- \*\* These agreements are made on an evergreen basis with no pre-determined termination date and subject to termination by written notice of either party with one-year advance notice.
- \*\*\* These agreements will automatically extend for one year after the lapse of the applicable term unless terminated by written notice of either party with one-year advance notice.

Under these agreements, the price is normally based on a negotiated formula that takes into account published benchmark prices and spot prices, such as FOB Korea and other benchmark prices published by Platts, Independent Commodity Information Services (“ICIS”) and IHS Markit.

### *Olefins and Derivatives*

#### *Olefins*

We use natural gas to produce and sell olefins, comprising ethylene and propylene. We also produce and sell olefins by-products, including:

- mixed C4, which is used in plastics and elastomers manufacturing;
- tail gas, which is used as fuel or feedstock in factories;
- cracker bottom, which is used as carbon black feedstock for automotive tire manufacturing and fuel oil replacement; and
- hydrogen, which is used in various industries, including the petrochemical and energy industries.

Our olefins unit also generates pyrolysis gasoline as a by-product, which is used as feedstock in our aromatics plants to produce BTX products.

Our olefins unit also produces and sells essential public utilities, namely, power, steam and industrial water (consisting of treated water, potable water, and demineralized water) for consumption in our olefins plants and distribution to a group of downstream petrochemical plants and other companies in the Map Ta Phut Industrial Estate. As of December 31, 2020, we had a power capacity of 317.5 megawatts, steam capacity of 1,040 metric tons per hour, industrial water capacity of 2,096 cubic meters per hour and 1,000 cubic meters per hour in sea water reverse osmosis capacity.

#### *Olefins — Nameplate Capacity and Capacity Utilization Rates*

As of December 31, 2020, we had an aggregate olefins nameplate capacity of 2,988,000 metric tons per year, comprising 2,376,000 metric tons per year of ethylene, 512,000 metric tons per year of propylene, 75,000 metric tons per year of butadiene and 25,000 metric tons per year of butene-1 . Our by-product production levels are based on the feedstock mix.

The follow table sets forth details of the respective nameplate capacities and production volumes of our principal olefins products for the year ended December 31, 2020.

<u>Olefins product</u>	<u>Nameplate capacity (Metric tons/year)</u>	<u>Production volume during the year ended December 31, 2020 (Metric tons)</u>
Ethylene.....	2,376,000	2,356,613
Propylene.....	512,000	450,296
Butadiene.....	75,000	28,975
Butane-1 .....	25,000	64,789

<b>Olefins product</b>	<b>Nameplate capacity (Metric tons/year)</b>	<b>Production volume during the year ended December 31, 2020 (Metric tons)</b>
<b>Total.....</b>	<b>2,988,000</b>	<b>2,900,673</b>

We measure the utilization of our olefins plants based on the plants' combined realized output, divided by their nameplate capacity. See "Management's Discussion and Analysis of Financial Condition and Results of Operations—Key Metrics by which we Measure Our Business—Key Metrics for Our Olefins, Polymer and EO-based Business Units—Utilization Rate" for more details on the utilization rates in relation to our olefins plants. For the year ended December 31, 2020, our capacity utilization rate for our olefins plants was 97% , compared with 102% for the year ended December 31, 2019.

#### *Olefins — Feedstock*

We use ethane, propane, LPG, NGL and naphtha, which is a by-product from our aromatics plants, as the principal feedstock for our olefins plants. We source ethane, propane, LPG and NGL for our production of olefins under gas feedstock supply contracts with PTT. We also secure LPG from ESSO (Thailand) Public Company Limited ("ESSO") and other suppliers under short-term arrangements, generally under market prices.

The following table sets forth details of our material feedstock agreements for our olefins business as of December 31, 2020.

<b>Olefins feedstock</b>	<b>Party</b>	<b>Contract quantity (Metric tons/year)</b>	<b>Termination year</b>
Ethane .....	PTT	1,900,000 – 2,500,000	2030
LPG .....	PTT	400,000 – 1,000,000	2030
NGL .....	PTT	380,000 – 400,000	2030
Propane .....	PTT	260,000 – 300,000	2030

We purchase additional feedstock under short-term contracts under spot prices from time to time to meet our feedstock needs. These agreements provide for minimum and, generally, maximum, quantities to be supplied at agreed pricing linked to regional benchmark prices, including those published by the ICIS.

#### *Olefins — Sales*

We retain a majority of our olefins production for internal use as feedstock for our downstream products, including polymers, EO-based performance products and phenol. During the year ended December 31, 2020, we retained approximately 88% of our olefins production and transferred it as feedstock to our downstream production of other products.

We sell the remainder of our olefins production to intermediate and downstream petrochemical plants in the Map Ta Phut Industrial Complex.

Our olefins offtake agreements typically specify a composite average price calculated for each month from one or more of the following benchmark prices:

- the arithmetic average of weekly Southeast Asia cost and freight ("SEA CFR") spot prices published by ICIS;
- the quarterly North Western Europe contract price published by ICIS, less a discount in the case of ethylene to reflect the prevalence of discounting for ethylene in North Western Europe; and
- the monthly U.S. Gulf Coast net contract price (or price after estimated prevailing discount) for ethylene and propylene published by IHS Markit.

Our main customers for our olefins products are domestic and include VNT, Glycol, HMC and Aditya Birla Chemicals (Thailand) Limited ("ADITYA"). The following table sets forth details of our material long-term olefins offtake agreements with respect to ethylene and propylene as of December 31, 2020.

<b>Olefins product</b>	<b>Party</b>	<b>Contract Quantity (metric tons/year)</b>	<b>Termination year</b>
Ethylene.....	PTT	300,000	Evergreen*
	VNT	69,000	2022***
	VNT	69,000	2021****
	Glycol	320,000-380,000	2027**
Propylene.....	PPCL	215,000-275,000	2026***
	HMC	94,500	2030**
	HMC	35,000-60,000	2024****
	ADITYA	10,000	2021
	GCO	161,000	2035

*Notes:*

\* *These agreements are made on an evergreen basis and will continue to be in effect after the lapse of the applicable term, unless terminated by written notice of either party with six months to two years of advance notice.*

\*\* *These agreements will be renewed or extended by written notice of either party with three-years of advance notice.*

\*\*\* *These agreements will automatically extend for one year after the lapse of the applicable term unless terminated by written notice of either party with one-year advance notice.*

\*\*\*\* *These agreements are renewable subject to the parties' mutual agreement.*

We sell our olefins by-products under long-term and short-term agreements that reference the price of products in Asian markets. Our main customers are domestic and include PTT, Bangkok Synthetics Company Limited (“BST”), TIG Hyco Company Limited, Thai Synthetic Rubbers Company Limited (“TSL”) and INEOS Styrolution (Thailand) Company Limited (“STN”). We retain our pyrolysis gasoline production for use as feedstock in our aromatics production.

Our material long-term olefins by-product offtake agreements as of December 31, 2020 are set forth in the following table.

<b>Olefins by-product</b>	<b>Party</b>	<b>Contract quantity (metric tons/year)</b>	<b>Termination year</b>
Mixed C4.....	BST	70,000	2035**
	BST	Min133,000	2036**
Butadiene .....	TSL	35,000-45,000	2025
	STN	4,000-5,500	2021*

*Note:*

\* *This agreement is renewable on a year-by-year basis subject to the parties mutual agreement.*

\*\* *These agreements will be renewed or extended by written notice of either party with three years of advance notice.*

### **Polymers**

We produce HDPE, LDPE, LLDPE and polystyrene, which are downstream products that we produce from our upstream feedstock intake and can be processed into everyday consumer products and products for the industrial and agricultural sectors. We sell our polymers products through our wholly-owned subsidiary, GCM, and charge commissions on our sales. We then distribute our polymer products through GCL, our wholly owned subsidiary, on fee-based arrangements. According to IHS Markit, we are the largest producer of LDPE and the second-largest producer of HDPE and LLDPE in Thailand based on nameplate capacity as of December 31, 2020. In addition to polyethylene and polystyrene, we produce PTA and PET by using our upstream products, paraxylene and MEG, from upstream units

#### **HDPE**

As of December 31, 2020, we have an HDPE nameplate capacity of 850,000 metric tons per year. We use processing technology licensed from Mitsui Chemical Inc. of Japan, capable of producing various grades of HDPE for film, blow molding pipe and tube, injection, thermoform sheets and fiber, which can be modified for desired properties and applications, including merchandise bags, drinking water bottles, milk bottles, water and carbonated soft drink caps, lubricant containers, truck bed liner, household utensils and articles, toys, and products

for construction and the agricultural sector like ropes, seines, nets, crates, stands for goods, water pipes, and electrical conduits. The HDPE we produce is distributed under the “InnoPlus” trademark.

*LLDPE and LDPE*

We produce LLDPE at a capacity of 800,000 metric tons per year and LDPE at 300,000 metric tons per year. LLDPE has multiple applications in the packaging industry, including shrink film, stretch film, heavy-duty bags, garment bags, frozen-food bags, water pipes, and electrical wire and cable jacketing and LDPE may be used in many applications such as film, extrusion coating, caps, stretch hood bags, foam, molded containers, dispensing bottles and wash bottles. Our LLDPE and LDPE products are distributed under our “InnoPlus” trademark name.

*Polystyrene*

We have a polystyrene nameplate capacity of 90,000 metric tons per year. We produce both general purpose polystyrene and high impact polystyrene under the “DIAREX” trademark. General purpose polystyrene is used in the production of appliances and disposable kitchenware and utensils and high impact polystyrene is used in the production of electrical appliances and toys.

*PTA and PET*

We produce PTA at a capacity of 970,000 metric tons per year and PET at 147,000 metric tons per year. PTA is an intermediate product for using as main feedstock of PET production. PET is the main material for producing plastic bottles and polyester for textiles.

*Polymers — Nameplate Capacity and Capacity Utilization Rates*

The polymer nameplate capacities and production volumes for the year ended December 31, 2020 are set out below.

<u>Polymer product*</u>	<u>Nameplate capacity (Metric tons/year)</u>
HDPE .....	850,000
LLDPE .....	800,000
LDPE.....	300,000
Hexene-1 .....	34,000
PP .....	810,000
PTA .....	970,000
PET.....	147,000
Polystyrene .....	90,000
Rotomolding Compound .....	61,000
PP Compound	30,000

*Note:*

\* A portion of our polymer products is produced and distributed by our joint ventures. The nameplate capacity information includes the total nameplate capacity of those joint ventures.

For the year ended December 31, 2020, our production volume for HDPE, LLDPE and LDPE was 945,605 metric tons, 723,079 metric tons and 303,071 metric tons.

For the year ended December 31, 2020, our capacity utilization rate for HDPE, LLDPE and LDPE was 101%, compared with 102% for the year ended December 31, 2019.

*Polymers — Feedstock*

We use ethylene derived from our olefins plants as the main feedstock for the production of HDPE, LLDPE, LDPE. We procure styrene monomer mainly from Southeast Asia providers as feedstock for the production of polystyrene.



## Polymers — Sales

We sell our polymer products to domestic and international molding factories through GCM, our wholly-owned subsidiary under offtake agreements at domestic and international benchmark prices, including SEA CFR and other published CFR benchmark prices.

### **EO-Based Performance Products**

We produce and distribute EO-based performance products such as EO and its derivative products, MEG and ethanolamines. This business provides additional value to our olefins products and satisfies domestic demand for these products that was previously met through imports.

#### *EO and MEG*

According to IHS Markit, we are the only producer of EO and MEG in Thailand under the operation of GC Glycol Company Limited with an MEG nameplate capacity of 423,000 tons per year. MEG is used as raw material to produce polyester fiber for the textile industry and PET resin for the production of clear PET bottles.

#### *Ethanolamines*

We produce ethanolamines, comprising monoethanolamine, diethanolamine and triethanolamine. These products are used as chemical additives in various industries, including personal and home care, cosmetics, pharmaceutical, machinery, agricultural and construction.

#### *EO-Based Performance Products — Nameplate Capacity and Capacity Utilization Rates*

The following table sets forth details of the respective nameplate capacities and production volumes of our principal EO-based performance products for the year ended December 31, 2020.

<b>EO-based product</b>	<b>Nameplate capacity (Metric tons/year)</b>	<b>Production volume during the year ended December 31, 2020 (Metric tons)</b>
MEG .....	423,000	403,771
Ethanolamines .....	50,000	16,909
<b>Total.....</b>	<b>473,000</b>	<b>420,680</b>

#### MEG

For the year ended December 31, 2020, our capacity utilization rate for MEG was 95% , compared with 97% for the year ended December 31, 2019.

#### Ethanolamines

For the year ended December 31, 2020, our capacity utilization rate for ethanolamines was 34% , compared with 60% for the year ended December 31, 2019.

#### *EO-Based Performance Products — Feedstock*

We predominantly use ethylene derived from our olefins plant as feedstock for the production of our EO-based performance products.

#### *EO-Based Performance Products — Sales*

We sell our EO-based performance products directly to domestic and international customers and through a number of distributors with price referencing to the Asian market.

### **Green Chemicals**

We process and distribute green chemicals, which are oleochemicals made from non-fossil materials such as palm oil, palm-kernel oil, vegetable oils or animal fats. Such oleochemicals include methyl ester, fatty

alcohols, glycerine, fatty acids and specialty oleochemicals. In addition to processing and distributing green chemicals through our subsidiaries, we have also invested in joint ventures to procure technology to produce biochemicals and bioplastics.

#### *Green Chemicals — Nameplate Capacity*

Our valued-added oleochemical products are produced and sold by GGC and Emery Oleochemicals (M) Sdn. Bhd. and Emery Specialty Chemicals Sdn. Bhd. (together with Emery Oleochemicals (M) Sdn. Bhd., “**Emery**”). We have a 72.29% stake in GGC, which produces and sells methyl ester, fatty alcohols and refined glycerine. In addition, we have a 50% stake in Emery, a joint venture with Sime Darby Plantation (Malaysia). Emery is principally engaged in the production and sale of fatty acids, fatty alcohol, refined glycerine, oilfield chemicals, ozone acids, plastic additives, methyl esters and other oleochemical derivatives.

We own a 50% stake in NatureWorks, through our subsidiary, PTTGC International USA Inc., in a joint venture with Cargill Inc. as partner. Through the joint venture, we focus on research and development of green chemical production technologies to produce bioplastics and biochemicals. We have also invested in a 50% stake in PTTMCC Biochem Company Limited through a joint venture with Mitsubishi Chemical Corporation. With the enhancement of our green chemical production capabilities, we seek to expand into new markets in Asia in response to growing demand for bio-based materials and bio-technologies.

As of December 31, 2020, we had a nameplate capacity of 1,643,000 metric tons of green chemicals per year. A portion of our green chemicals are produced and distributed by our joint ventures. The foregoing nameplate capacity of our joint ventures reflects their total nameplate capacity.

#### *Value Added Oleochemicals*

##### Methyl Esters

We produce and sell methyl ester, which is derived from vegetable oil known as biodiesel, which we blend with petroleum-based diesel. GGC operates plants with a combined methyl ester nameplate capacity of 500,000 metric tons per year as of December 31, 2020.

##### Fatty Alcohols

We produce and sell fatty alcohols, which are mainly used in home and personal care products and as fatty alcohol ethoxylate feedstock. As of December 31, 2020, we had a fatty alcohols nameplate capacity of 180,000 metric tons per year, of which 80,000 metric tons were derived from the Emery group and 100,000 metric tons were derived from Thai Fatty Alcohols Company Limited (“**TFA**”), a subsidiary of GGC.

##### Glycerins

We produce and sell refined glycerin, a clear, almost colorless, odorless chemical with applications in the pharmaceutical, food and personal care industries. GGC had a glycerin nameplate capacity of 51,000 metric tons per year as of December 31, 2020.

##### Fatty Acids

We produce and sell fatty acids, basic oleochemical products with applications in the personal care and cosmetics industries. Emery had a fatty acid nameplate capacity of 350,000 metric tons per year as of December 31, 2020.

##### Specialty Oleochemicals

Through our joint ventures, we produce and sell specialty oleochemicals from the processing of basic oleochemicals, which include triacetin, ozone acid, plastics additives, and chemicals used for oil wells.

##### Fatty Alcohol Ethoxylates

Our fatty alcohol ethoxylates plant is operated by Thai Ethoxylate Company Limited (“**TEX**”), a joint venture between BASF Thai Ltd. (“**BASF**”) and GGC. Fatty Alcohol Ethoxylates is used in the production of shampoos, dishwashing liquid and cleaning solutions.

## Bioplastics and Biochemicals

Through technology we acquired from our joint venture partners, NatureWorks, we manufacture and develop bioplastics and biochemical products. The initial feedstock for bioplastics and biochemical are sugar, cassava starch and corn starch to produce lactic acid and PLA. NatureWorks had a bioplastics nameplate capacity of 150,000 metric tons per year as of December 31, 2020. In addition, our joint venture, PTTMCC Biochem Company Limited, produces and sells compostable plastics, PBS. Located in Thailand, PTTMCC has a bioplastics nameplate capacity of 20,000 metric tons per year as of December 31, 2020.

### Green Chemicals — Feedstock

We, either directly or through our joint venture, produce oleochemicals from palm oil, palm-kernel oil, vegetable oils and animal fats. We source these feedstock principally from domestic providers. In cases where domestic supply of feedstock is limited, we source portions of our feedstock from other Asian countries, including Malaysia and Indonesia. The price is determined by market price and adjusted according to factors such as the geographical source of the feedstock, our relationship with the supplier and the quality and quantity purchased.

### Green Chemicals — Sales

We sell our green chemical products both domestically and internationally. Through Emery, we produce and sell value-added oleochemicals including fatty alcohols, fatty acids and specialty oleochemicals globally. Emery maintains sales representative offices and production sites in North America, Europe and Asia. We sell a portion of our green chemicals to TEX, a joint venture between GGC and BASF and also distribute to global companies such as ESSO, Kao Chemicals GMBH and Galaxy Surfactants Ltd. We produce and sell methyl ester through GGC to biodiesel blenders including PTT, Chevron (Thai) Company Limited and Thai Oil Public Company Limited (“**Thai Oil**”). NatureWorks sells its PLA production marketed under the “Ingeo” brand to consumers worldwide, including multinational companies such as Frito-Lay and Danone.

## Phenol

We are engaged in the production and distribution of phenol, which is used as feedstock for the production of engineering plastics. These products are used in industries such as the automotive industry, appliance and electronics industry, and construction industry.

### Phenol — Nameplate Capacity and Capacity Utilization Rates

The following table sets forth details of the respective nameplate capacities and production volumes of our performance materials and chemicals as of December 31, 2020:

<b>Phenol</b>	<b>Nameplate capacity (Metric tons/year)</b>	<b>Production volume during the year ended December 31, 2020 (Metric tons)</b>
Phenol.....	492,000	538,856
Acetone .....	304,000	336,773
Bis-phenol A .....	158,000	167,884
<b>Total.....</b>	<b>954,000</b>	<b>1,043,513</b>

For the year ended December 31, 2020, the capacity utilization rate for production of phenol was 109%, compared to 110% for the year ended December 31, 2019.

For the year ended December 31, 2020, the capacity utilization rate for production of bis-phenol A was 107%, compared to 109% for the year ended December 31, 2019. The plants’ Lower capacity utilization rate for the year ended December 31, 2020 was due to a planned maintenance shutdown in 2020.

### Phenol — Feedstock

The principal feedstock for our phenol products consist of benzene and propylene, which we mainly source internally from our aromatics and olefins plants. We use a portion of our phenol and acetone production to produce bis-phenol A.

### *Phenol — Sales*

We sell phenol products to both wholesalers and directly to end-users within Thailand, other countries in Asia, and Europe. Our phenol and bis-phenol A sales agreements typically specify an average price of China Main Port per month as published by ICIS.

### *Performance Materials and Chemicals*

We are engaged in the production and distribution of performance materials and chemicals, which are high value-added chemical products used as key components in a wide variety of consumer and industrial products. Performance materials and chemicals include HDI and their derivative products, propylene oxide, polyols, acrylonitrile, and methyl methacrylate. We have invested in a joint venture with Asahi Kasei under PTT Asahi, which produce acrylonitrile and methyl methacrylate. Through our performance materials and chemicals business unit, we invest in further research and development into the production of new downstream products.

### *Performance Materials and Chemicals — Nameplate Capacity and Capacity Utilization Rates*

As of December 31, 2020, we had a nameplate capacity 792,000 metric tons of performance materials and chemicals per year. A portion of our performance materials and chemicals are produced and distributed by our joint ventures. The foregoing nameplate capacity of those joint ventures reflects their total nameplate capacity.

We, through our subsidiary Vencorex, have nameplate capacities of 127,000 metric tons of HDI and derivatives per year. Vencorex is one of the world's largest producers of HDI. Through GC Oxirane, we have nameplate capacities 200,000 metric tons of propylene oxide and GC Polyols, have nameplate capacities of 180,000 metric tons of polyols.

We, through our joint venture with Asahi Kasei under PTT Asahi, have a nameplate capacity of 270,000 metric tons of acrylonitrile and methyl methacrylate per year.

### *Performance Materials and Chemicals — Feedstock*

The principal feedstock for the production of our performance materials and chemicals is hexamethylene diamine, which Vencorex sources from suppliers in Europe and America. A fully integrated value chain of propylene, propylene oxide and ethylene oxide are main feedstocks, which propylene oxide and polyols sources from our internally plants respectively

### *Performance Materials and Chemicals — Sales*

We sell performance materials and chemicals to both wholesalers and directly to end-users within Europe, Thailand, other countries in Asia. All our sales of HDI and derivatives take place through Vencorex, which is an entity located in France. For the propylene oxide and polyols, we sell high quality to distributors and directly to customers in Southeast Asia, India, China, Africa, Middle East and other countries.

### *Services and Others*

We operate a range of business services in Thailand for our subsidiaries and associated companies within the Group and for the PTT Group and customers in the downstream petrochemical industry and derive service fees from third party industrial customers.

### *Jetty and Chemical Tank Farm*

We operate liquid chemical storage and transportation facilities, including a jetty, to serve industrial customers located within the Map Ta Phut Industrial Complex.

### *Public Utility Production/Generation and Sale*

We generate and distribute electricity, steam and industrial water to our plants and third parties located within the Map Ta Phut Industrial Complex.

### *Maintenance and Engineering Services*

We provide maintenance services, design and engineering services, construction services, pipe and conduit work services, procurement services, material work services, and production administration services to petroleum and petrochemical plants in Map Ta Phut Industrial Complex and other industrial groups in Thailand and Asia. We provide consultancy services and plant technical support to the PTT Group.

### *Safety, Occupational Health, and Environmental Services*

We provide integrated services for training in safety, occupational health, and the environment, design and installation of fire prevention systems, and consulting services on international standardization of quality management, safety management and occupational health standards.

### *Pipeline Infrastructural Services*

We provide pipeline-related services and lays transmission pipelines for petroleum and petrochemical operators in the Map Ta Phut Industrial Complex.

### *Information Technology Services*

We provide information technology and communication services to the PTT Group.

### *Marketing and Sales of Health and Nutrition Products*

We provide trading services related to methylamine derivatives and health and nutrition products such as food, supplements, personal care compounds and other products.

## **Plant Maintenance**

As with all refineries and petrochemical plants, our plants are shut down periodically for scheduled turnaround maintenance and unscheduled corrective or emergency maintenance. Scheduled maintenance shutdowns reduce our utilization rates but increases plant safety and efficiency and reduces the possibility of future unscheduled plant shutdowns and extend plant life.

The number and length of turnarounds (scheduled outages of a unit in order to perform necessary inspections and testing to comply with industry regulations and to permit us to carry out any maintenance activities that may be necessary) carried out in any given period can impact operating results. We schedule major turnaround maintenance for each upstream plant every three to five years for periods of approximately 30 to 45 days and on a staggered basis to minimize impact on our overall production. When possible, we seek to schedule the timing of turnarounds to coincide with the scheduled shutdowns of gas feedstock providers and periods of relatively lower demand for the products of the relevant units. In between major scheduled turnaround maintenance events, we also plan minor scheduled maintenance periodically, during which our plants are entirely or partially shut down.

Our maintenance and engineering services are managed by our subsidiary GC Maintenance and Engineering Company (“GCME”). GCME serves our plants and other petrochemical plants in the Map Ta Phut Industrial Complex and other industrial estates in Thailand and Asia in maintenance, design and engineering, construction, pipe and conduit work, procurement, and production administration.

## **Utilities**

As part of the production process, we consume a variety of utilities, including steam, industrial water, gas and electricity. We are able to meet some of these needs through production within the Group. To the extent our internal production of these utilities is insufficient, we purchase such utilities from third parties. See “—Our Business Units and Products—Services and Others—Public Utility Production/Generation and Sale” above.

## **Storage**

Our plants have storage tanks and facilities which enable us to store our products before delivery and to store feedstock before use. We believe our storage facilities have sufficient capacity to accommodate normal operations, including foreseeable circumstances where we or one or more of our customers or feedstock suppliers may experience an unplanned plant shutdown for a limited period of time. Our inventory of products may increase

from time to time, reflecting unscheduled shutdowns or other problems at our customers' plants that prevent or delay their taking delivery, as well as our inventory planning in advance of our scheduled shutdowns and our customers' inventory planning for planned production. Pursuant to the regulations of the Energy Business Department of the Ministry of Energy issued in 2006, each Thai refinery, including ours, is required to hold as legal reserve an equivalent of 5% of its annual production of crude oil and certain other feedstock for producing refined petroleum products domestically. In January 2021, the Ministry of Energy allows Thai refinery to reduce legal reserve to 4% until December 31, 2021 to ease the impact of COVID-19 on Thai refiners. From January 1, 2022 onwards, legal reserve will be required at 5% of the relevant company's annual production.

## **Competition**

We face significant competition in the refinery and petrochemical markets. Given that most of the products are commodities, the main competitive criteria are pricing, service and lead time to product delivery. In certain segments of the polymer markets, where products must satisfy specified technical performance criteria, competition is also based on performance, quality and customer service. A key competitive factor is the ability to manage costs successfully, which requires management focus on reducing unit costs and improving efficiency. The main drivers in this respect include technology, scale, feedstock access, asset utilization, logistics, level of integration, geographical location of feedstock, plants and customers, and the ability to execute capital projects efficiently.

We compete against a large number of companies, many of which have greater access to resources, better technologies or higher levels of integration than we do, are fully or partially state-owned and could have broader goals than maximizing their profits, such as investing in the economies of their respective countries and providing local employment. See *“Risk Factors—Risks Relating to Our Business—We sell a significant portion of our petrochemical and refinery production in the highly competitive Thai domestic and international spot markets and may face competitors with greater resources in these markets.”*

We compete in both the domestic market in Thailand and the international markets. We consider Thailand to be our principal market, not only because we are a Thai company, but because of the strength of our strategic business relationship with PTT with respect to feedstock supply and offtake arrangements. In the international markets, we compete with a number of international refinery and petrochemical companies. In these markets, proximity to our customers is an important cost-driver as delivery and freight costs affect our pricing, and therefore our price competitiveness. For this reason, our international customers are mostly located in Asia, including China, India, the Philippines, Singapore, Vietnam, Indonesia, Malaysia, Taiwan and South Korea. However, we plan to further expand our sales into Asia, especially ASEAN countries, according to our investment plans. See *“Business—Strategy.”*

## **Refinery**

PTTOR is the principal customer for our refined products, which include diesel, jet fuel and fuel oil. As we have long-term refinery offtake contracts with PTTOR, which are generally based on prevailing market prices, we do not face any material competition in securing purchasers for our refined products. A small percentage of these products are also exported at spot prices to capture favorable margins based on timing. We have also undertaken to find new customers for our products, particularly fuel oil.

Some of the other key players in the Thai domestic market for refined products include Esso, Thai Oil, IRPC, SPRC and Bangchak Corporation Public Company Limited (**“Bangchak”**).

## **Aromatics**

We aim to continuously improve production of our aromatic products to ensure that we are able to most effectively use available feedstock to ensure lowest possible costs to allow us to compete effectively in the aromatics markets. We believe we are able to achieve this through the use of leading production technologies, ensuring feedstock flexibility in the form of either domestic or imported condensate that have different chemical properties and strategically locating ourselves in the Map Ta Phut Industrial Complex where a large number of customers are also located to ensure timely and less costly delivery.

We have a leading domestic market share in the majority of the aromatics products we produce. In the domestic market, our key competitors are Thai Paraxylene Company Limited (**“Thai Paraxylene”**) for benzene and ESSO and Thai Paraxylene for paraxylene.

Our remaining products are sold internationally to countries in the Asian region, such as Taiwan, Singapore, Malaysia, Indonesia, China, India and South Korea, as well as countries in the Middle East and Europe where we are price-competitive with other international competitors as we have lower freight costs due to our geographical proximity.

### ***Olefins***

We export a portion of our olefins overseas at spot prices to take advantage of pricing in the market. With respect to the remaining portion that we sell to third parties, our major competitor is Siam Cement Group.

### ***Polymers***

Polymer-based products such as HDPE, LLDPE, LDPE and PS are downstream products which require significant investments. Pricing for these products are largely driven by macroeconomic conditions, which in turn drive demand for products for which polymers are required. Our polymer-based products are largely exported.

The marketing and distribution of our polymer-based products are coordinated through GCM. Through GCM, we have a sales and distribution network that covers different regions in Thailand, as well as internationally.

We sell our HDPE, LLDPE and LDPE products under the marketing name “InnoPlus” and our PS products under the marketing name “DIAREX.” We also have compound products that use our own resins as base and are marketed under the name “PlastMate.” Our competitors in the domestic market include IRPC (an affiliated company), Siam Cement Group and TPI Polene Public Company Limited.

### ***EO-based Performance Products***

We largely sell our EO-based performance products in the domestic market and export the rest. In the MEG market, we compete against the world’s major MEG producers, such as the SABIC, Shell and Petronas group companies. These competitors have significant resources that allow for greater economies of scale and other competitive advantages. Our competitors in the ethanolamines market include major producers such as Dow Chemical Company Ltd., BASF and Petronas, which have extensive networks of customers and distributors worldwide. Our key competitive advantages in being the only local supplier in the Thai market are our ability to deliver high quality products with lower risk of contamination during transportation, shorter lead-times, greater storage and delivery flexibility and proximity to local and regional customers. We are located amidst the major markets in the Asia Pacific region, which gives us access to regional suppliers and customers

### ***Green Chemicals***

The prices for these products are driven by the balance of supply and demand and fluctuations in the availability of their raw materials, which include other vegetable oils and animal fat products. We compete against worldwide operators of value-added oleochemicals, such as KL-Kepong Oleomas Sdn. Bhd., Ecogreen Oleochemicals, PT. Musim Mas and Wilmar International, all of which have production and distribution bases worldwide. In the domestic market, we compete with major producers of methyl ester such as Patum Vegetable Oil Company Limited, Bangchak Biofuel and New Biodiesel Company Limited and Energy Absolute Public Company Limited. In the bioplastics business, NatureWorks operates a commercial-scale plant with worldwide sales and distribution networks of Polylactic Acid (PLA) which market has been continually growing due to increasing demand for sustainable and alternatives to conventional plastics..

### ***Phenol and Performance Materials and Chemicals***

As our phenol and performance materials and chemicals are intermediate inputs used in the production of other consumer products, the demand for these products are generally driven by global macroeconomic conditions. The key competitive advantages for our performance materials and chemicals are quality, our extensive distribution network from our business partnerships, including PTT Phenol Company Limited (“PPCL”) and Vencorex, and stable and reliable source of feedstock from PTT. We sell and distribute our products both directly and through agents and distributors.

As we own and operate the only phenol plant in Thailand, our sole competitors in marketing and sales of phenol products are foreign producers of phenol and acetone from Singapore and Japan, such as the Mitsui Chemicals group. Similarly, with respect to bis-phenol A, though there are two bis-phenol A plants in Thailand that belong to Covestro Thailand and PPCL (a subsidiary), as production is used by Covestro Thailand for its

internal captive use in polycarbonate production and as PPCL is a subsidiary of ours, our only competitors are foreign producers from Singapore, Japan, South Korea and Taiwan.

Vencorex is one of the world's leading producers of HDI and its derivatives. HDI and its derivatives are intermediate petrochemical products used specifically in high performance polyurethane coatings for automotive (OEM and refinishing) applications, railway, aerospace, general industry, plastic, wood, coil, can, leather finishing and adhesives. Other key important HDI players in Europe and Asia are Covestro BASF and Wanhua Chemical Group.

## Marketing

As our products from our refinery and petrochemical business units are largely commodities, with the exception of our polymer-based products which are marketed under the "InnoPlus", "DIAREX" and "PlastMate" brands, we do not expend significant resources in the marketing of our products. For the year ended December 31, 2020, our total selling and distribution expenses (including distribution, promotional, marketing and personnel expenses) were THB3,687.1 million (US\$122.9 million).

We generally sell our products directly to our customers or through distributors, except for our polymer-based products. These products are sold through GCM

We have a sales and marketing team based in Bangkok that is responsible for sales and marketing activities related to our customers worldwide. The team focuses on understanding our customers' requirements, maintaining good relationships and providing various services. We are focused on relationship management to ensure that our customers' expectations are met.

## Plants and Properties

As of December 31, 2020, we have a total of 32 plants and five jetties. The majority of our material plants and properties are located in the Map Ta Phut Industrial Complex in Rayong, Thailand. Our material plants and properties are set forth in the table below.

<b>Plant/Property</b>	<b>Location</b>	<b>Usage or principal products manufactured</b>	<b>Unit</b>	<b>Capacity</b>
<b>Refinery</b>				
Refinery	Map Ta Phut Industrial Complex	Crude oil	Barrels/day	145,000
Condensate Splitter Unit I	Map Ta Phut Industrial Complex	Condensate	Barrels/day	70,000
Condensate Splitter Unit II	Map Ta Phut Industrial Complex	Condensate	Barrels/day	65,000
<b>Aromatics</b>				
Aromatics Complex I	Map Ta Phut Industrial Complex	Paraxylene, benzene, cyclohexanes, mixed xylenes and orthoxylene	Metric tons/year	1,189,000
Aromatics Complex II	RIL Industrial Complex	paraxylene, benzene and toluene	Metric tons/year	1,230,000
<b>Olefins</b>				
Olefins Plant 1	Map Ta Phut Industrial Complex	Ethylene and propylene	Metric tons/year	588,000
Olefins Plant 2/1	Map Ta Phut Industrial Complex	Ethylene and propylene	Metric tons/year	825,000
Olefins Plant 2/2	Map Ta Phut Industrial Complex	Ethylene and propylene	Metric tons/year	450,000
Olefins Plant 3	Map Ta Phut Industrial Complex	Ethylene and propylene	Metric tons/year	1,025,000
<b>Polymers</b>				
Polymers Plant HDPE 1	Map Ta Phut Industrial Complex	HDPE	Metric tons/year	550,000
Polymers Plant HDPE 2	Map Ta Phut Industrial Complex	HDPE	Metric tons/year	300,000



<b>Plant/Property</b>	<b>Location</b>	<b>Usage or principal products manufactured</b>	<b>Unit</b>	<b>Capacity</b>
Polymers Plant LLDPE	Complex Map Ta Phut Industrial Complex	LLDPE	Metric tons/year	800,000
Polymers Plant LDPE	Map Ta Phut Industrial Complex	LDPE	Metric tons/year	300,000
Polymers Plant HMC <sup>(1)</sup>	Map Ta Phut Industrial Complex	PP	Metric tons/year	810,000
Polymers Plant GCS	Map Ta Phut Industrial Complex	Polystyrene	Metric tons/year	90,000
PTA Plant <sup>(2)</sup>	Map Ta Phut Industrial Complex	PTA	Metric tons/year	970,000
PET Plant <sup>(3)</sup>	Map Ta Phut Industrial Complex	PET	Metric tons/year	147,000
Rotomolding Compound Plants <sup>(4)</sup>	United Kingdom, Europe, Australia, New Zealand, Malaysia	Rotomolding Compound	Metric tons/year	64,000
PP Compound Plant DYCT <sup>(5)</sup>	Amata City Industrial Estate	PP Compound	Metric tons/year	30,000
<b>EO Based</b>				
EO Plant Glycol	Map Ta Phut Industrial Complex	MEG	Metric tons/year	423,000
EA Plant	Map Ta Phut Industrial Complex	Ethanolamines	Metric tons/year	50,000
<b>Green Chemicals</b>				
GGC	Map Ta Phut Industrial Complex, Thai Eastern Industrial Land	Oleochemicals	Metric tons/year	651,000
Oleochemicals Plants <sup>(5)</sup>	Malaysia, United States, Germany	Oleochemicals	Metric tons/year	698,000
EX Plant <sup>(6)</sup>	Map Ta Phut Industrial Complex	Ethoxylate	Metric tons/year	124,000
PLA Plant <sup>(7)</sup>	United States	PLA	Metric tons/year	150,000
PBS Plant <sup>(8)</sup>	Asia Industrial Complex	PBS	Metric tons/year	20,000
Propylene Oxide Plant	Hemaraj Eastem Industrial Estate	Propylene Oxide	Metric tons/year	200,000
Polyols Plant	Hemaraj Eastem Industrial Estate	Polyols	Metric tons/year	180,000
<b>Performance Materials and Chemicals</b>				
Phenol Plant	Map Ta Phut Industrial Complex	Phenol	Metric tons/year	492,000
Bis-Phenol-A Plant	Map Ta Phut Industrial Complex	Bis-phenol-A	Metric tons/year	158,000
HDI and Derivatives Plant <sup>(9)</sup>	France	HDI and Derivatives	Metric tons/Year	104,000
Derivatives Plant <sup>(9)</sup>	United States	Derivatives	Metric tons/Year	11,000
Derivatives Plant <sup>(9)</sup>	Thailand	Derivatives	Metric tons/Year	12,000
Acrylonitrile Plant <sup>(10)</sup>	Thailand	Acrylonitrile	Metric tons/Year	200,000
Methyl methacrylate Plant <sup>(10)</sup>	Thailand	Methyl methacrylate	Metric tons/Year	70,000

*Notes:*

(1) Operated by HMC, our 41.44%-owned subsidiary.

(2) Operated by GC-M PTA, our 74.00%-owned subsidiary.

(3) Operated by TPRC, our 74.00%-owned subsidiary.

(4) Operated by RGL, our 49.00%-owned subsidiary.

(5) Operated by Emery, our 50.00%-owned subsidiary.

(6) Operated by TEX, 50.00%-owned subsidiary of GGC.

(7) Operated by NatureWorks, our 50.00%-owned subsidiary.

(8) Operated by PTT MCC, our 50.00%-owned subsidiary.

(9) Operated by Vencorex, our 90.82%-owned subsidiary.

(10) Operated by PTTAC, our 50.00%-owned subsidiary.

## Investment Promotion

We have obtained investment promotion privileges from the BOI pursuant to the Investment Promotion Act B.E. 2520 (1977) (the “**Investment Promotion Act**”). Under the Investment Promotion Act, a company looking to make an investment in Thailand may apply to the BOI for investment incentives provided by the Government, including tax privileges, relaxation of restrictions on foreign participation, business protection, land ownership rights, and customs duties reduction/exemption. In granting the promotional privileges, the BOI typically set conditions with which the promoted company must comply.

We hold investment promotion privileges granted by the BOI with respect to our plants and investment projects for our production of petrochemical products. These rights and privileges granted to us by the BOI under these investment promotion certificates include, among others:

- permission to bring into Thailand foreign technicians who are skilled workers, experts, and their spouses and dependents;
- foreign nationals who are skilled workers or experts and who are permitted to stay in Thailand shall be granted a work permit for a specific position approved by the BOI for the period of permitted stay;
- exemption of import duty on machinery approved by the BOI;
- exemption of import duty on raw materials, things or other materials that need to be imported in order to manufacture our products for export for a given period, for example, up to five years from the date on which such material is first imported;
- permission to deduct funds for the purpose of assessing corporate income tax in an amount that is double the costs incurred for transportation, electricity and water supply for a given period, for example, up to ten years from the date on which income is first derived from such operations;
- exemption of income tax for certain operations for a period up to, for example, eight years from the date on which income is first derived from such operations. The value of corporate income tax exempted is also limited to a certain amount, as specified in each particular investment promotion certificate, and is subject to adjustment according to the actual investment capital on the date of commencement of operation under the promoted project;
- permission to deduct from the net profits an amount not exceeding a certain percentage, for example 25%, of the cost of installation or construction of facilities, in addition to normal depreciation for a period as specified in the relevant promotion certificate; and
- permission to take out or remit abroad money in foreign currency.

We are required to comply with a number of conditions set forth in each investment promotion certificate, or otherwise, risk losing the investment promotion privileges. These conditions include, among others:

- using or processing raw and essential materials that are imported for use specifically in the production process of our products or commodities for export only in the promoted activity if such raw and essential materials are exempt from import duties;
- reporting to the Office of the BOI, an administrative body that is charged with supervising the administrative work of the BOI, each time there is a change in the ratio of foreign-to-Thai shareholding, or a change in the foreign shareholders of different nationalities;
- reporting to the Office of the BOI our financial status and operational results for every fiscal year;
- installing and implementing systems which control damage to the environment or danger or nuisance to those in the nearby vicinity;
- maintaining the Thai shareholding proportion to be not lower than the minimum thresholds set out in the investment promotion certificates, most of which are set at 51% of the total outstanding shares; and

- maintaining our place of business at the location specified in the investment promotion certificates, such as the Map Ta Phut Industrial Complex, for a certain period of time.

### **Research and Development and Intellectual Property**

Each of our eight core business units has a dedicated research and development team. Our research and development activities are principally focused on developing and enhancing our existing technologies and products and developing new products through technology purchased or licensed from our joint venture partners. We also maintain a research development center in our office in Rayong province, Thailand.

We have registered many of our brand names, including “InnoPlus,” “InnoPlus&Logo,” “PlastMate,” “Qmical,” “Diarex” and “Cusmer,” as trademarks in Thailand and certain foreign countries in which we distribute our products. In addition, our joint venture NatureWorks sells its PLA production marketed under the “Ingeo” brand. We also own other trademarks and patents, certain of which are pending transfer from our subsidiaries and amalgamated companies following the Amalgamation. See *“Risk Factors—Risks Relating to Our Business—Failure to adequately protect our intellectual property could have an adverse and material effect on our results of operations or financial condition.”*

### **Health and Safety**

We are subject to various health and safety laws in each of the jurisdictions in which we operate. Our operations in Thailand are subject to the Safety, Health and Workplace Act B.E. 2554 (2011), which imposes certain general duties and procedures in relation to health and safety in the workplace. In accordance with the Act and other applicable laws, we have implemented safety procedures to help protect the health and safety of our workers, assets and the environment.

With respect to our employees, we conduct physical examinations, with a particular focus on those employees who are exposed to hazardous substances. We have also implemented workplace hygiene monitoring plans to ensure that heat, light, noise and chemical levels are kept within safe thresholds.

We coordinate with local and municipal authorities around the Map Ta Phut Industrial Complex on disaster prevention initiatives. For example, we are a member of the Emergency Mutual Aid Group, which assists in drafting emergency response plans for the Rayong province and the industrial estates in Map Ta Phut, staging provincial emergency drills and organizing evacuations of communities. We have also assigned employees with relevant skills in emergency response matters to assist the Rayong provincial governor, the Map Ta Phut municipality and the Emergency Mutual Aid Group in developing community emergency response plans and conducting emergency drills to prepare for plan accidents that may affect local communities.

We have also prepared for oil spillage contingencies by participating in the Rayong Oil Spill Emergency Response drills organized by the Oil Industry Environmental Safety Group Association, related government agencies, the Marine Department and the Royal Thai Navy. These drills test the preparedness of emergency plans, oil slick removal plans and communication lines with neighboring communities.

### **Environment**

We are subject to strict environmental laws in all of the jurisdictions in which we operate. These requirements address, among other things, air and odor emissions, wastewater discharges, noise and vibrations, accidental releases into the environment, human exposure to hazardous materials, the disposal of wastes, the clean-up of contamination, and the maintenance of safe conditions in the workplace.

Our operations in Thailand are subject to various environmental laws and regulations, including the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 (1992), as amended, the Factory Act B.E. 2535 (1992), as amended and the Fuel Oils Act B.E. 2543 (2000), as amended. In 1992, Thailand strengthened environmental laws and regulations in order to promote the environment and sustainable development. The Constitution of Thailand also contains specific provisions regarding the Government’s responsibilities and citizens’ rights in managing and developing natural resources and the environment.

Environmental laws and regulations, among others, restrict the type, quantities and concentration of various substances that can be released into the environment. Our operations are also subject to laws and regulations relating to the generation, handling, storage, transportation, disposal and treatment of petroleum products and waste materials. These environmental laws and regulations, particularly those relating to air emissions and water discharged from our plants and operations, affect our oil refinery business. The primary

governmental bodies which supervise the environmental aspect of our operations are the Office of Natural Resources and Environmental Policy and Planning of the Ministry of Natural Resources and Environment, the Pollution Control Department of the Ministry of Natural Resources and Environment, the Industrial Works Department of the Ministry of Industry, and the Department of Energy Business of the Ministry of Energy.

We conduct regular reviews aimed at achieving compliance with our environmental policies. We have adopted environmental compliance procedures, including environmental assessment, safety, health and environment regulations management, and waste management procedures. We continue to monitor changes in safety, health and environment rules and regulation and engage in mitigation projects to anticipate any emerging issues, including VOC emission and soil and groundwater quality.

We have adopted international codes, standards and recommended practices from the International Organization for Standardization (“ISO”), American Petroleum Institute and Process Safety Management for process safety management. We have received both ISO 14001 and OSHAS 18001 certifications. We believe we are in compliance in all material respects with environmental laws and regulations applicable to us.

### **Sustainability Initiatives**

We are committed to incorporating circular economy concepts in our operating principles, covering both manufacturing and development of our products. We were ranked #1 for sustainability in the DJSI for the second consecutive year and also ranked among the top 10 companies in the chemicals sector by the DJSI World Index and Emerging Markets Index for the eighth consecutive year.

As part of our sustainability initiatives, we commit to maximize resources utilization while minimizing environmental impact, including through energy efficiency programs, reduction of greenhouse gas emissions, water and waste management. Also, we are the largest bioplastics producer in the world by capacity with comprehensive offerings from PLA and PBS. Furthermore, we aim to strengthen our environmental-friendly product portfolio by establishing Thailand’s first advanced polymer recycling facility through our subsidiary ENVICCO Limited, in partnership with ALPLA that will help convert over 60,000 tons per year of plastic waste to become valuable materials. In collaboration with the Tourism Authority of Thailand and the ECOALF Foundation, we launched the “Upcycling the Oceans, Thailand” project to address the problem of plastic waste in tourist areas, promote responsible tourism and support ocean conservation.

### **Employees**

As of December 31, 2020, we had approximately 6,883 full-time employees in our operations around the world, not including the employees of our joint ventures and non-wholly-owned subsidiaries. Less than 9% of these employees were located outside of Thailand.

Historically, we have enjoyed good labor relations and we are committed to maintaining these relationships. There have been no work stoppages due to employee strikes at any of our production sites during the past five years.

### **Insurance**

We carry all-risks insurance, business interruption insurance and third-party liability insurance for all our commercial operating plants. Our projects under construction are also subject to full insurance coverage in accordance with international standards. We also carry policies for loss of gross profits as a consequence of fire, explosion, electrical damage, machinery breakdown, natural catastrophes, and fuel and/or power shortages, including third party liability insurance, marine cargo insurance, computer insurance and life insurance for all of our employees. We believe our policies are in accordance with customary industry practices, including deductibles and coverage amounts.

### **Legal Proceedings**

As is the case with many companies in the chemical industry, we are and may from time to time become a party to claims and lawsuits incidental to the ordinary course of our business.

Other than the litigation described below, we are not currently involved in any legal or arbitration proceedings that are expected to have a material adverse effect on our financial condition or operations.

For a description of proceedings that arise to the level of contingent liabilities, refer to note 37 to our audited financial statements, included elsewhere in this Offering Memorandum.

#### ***Civil litigation with Rayong Purifier Public Company Limited***

On December 28, 2009, we received dispute letter No. 114/2552 from the Thai Arbitration Institute (the “TAI”) of the Alternative Dispute Resolution Office in connection with a claim made by Rayong Purifier Public Company Limited, currently registered as RPCG Public Company Limited (“RPCG”) against PTT and us. Pursuant to the dispute letter, RPC claims a breach of the terms of a condensate residue purchase agreement between PTT and RPCG dated August 8, 1995. The amount of claim was THB13,805.6 million (US\$460.0 million). On February 10, 2010, we filed a petition for removal on grounds that we were not a contractual party to the condensate residue purchase agreement. On March 8, 2010, the TAI issued an order to remove us from the arbitration proceedings on the basis that we were not a party to the condensate residue purchase agreement, and therefore the arbitration provision thereunder did not apply to us.

Subsequent to our removal from the arbitration proceedings, on August 27, 2010, RPCG filed a lawsuit with the Civil Court of Thailand against PTT and us. The lawsuit claimed similar damages as a result of breach and tort under the condensate residue purchase agreement. The amount of claim was THB9,380.0 million (US\$312.6 million). On November 4, 2010, we filed a response with the Civil Court denying all claims made by RPCG and asked the court to dismiss the case. On November 12, 2010, the Civil Court issued an order stating that the court would wait for the decision of the TAI on the dispute between RPCG and PTT before rendering its judgment. On May 21, 2013, on the basis that the arbitration was still ongoing, the Civil Court temporarily removed the case from the case list until a final decision was reached in the arbitration.

On March 25, 2016, the arbitration decided against PTT, and awarded RPCG damages. In response, PTT applied to the Civil Court to have the arbitration award withdrawn. Thereafter, on September 19, 2019, the Civil Court rendered a judgment to enforce the arbitral award. PTT has submitted an appeal to the Supreme Court. As of the date of this Offering Memorandum, the Supreme Court has not yet rendered a decision.

#### ***Civil litigation relating to oil spill in Rayong***

In the third quarter of 2014, several lawsuits were filed against us in both the Civil Court and the Rayong Provincial Court in relation to an oil spill incident. The plaintiffs have claimed a range of remedies, including compensation and measures to rehabilitate the area. Some of these claims have been dismissed by the Civil Court, but on August 25, 2016, the Civil Court ordered us to pay damages including interest and rehabilitation of approximately THB11.3 million (US\$0.4 million). On February 17, 2017, we appealed against the Civil Court’s decision.

On May 11, 2018, we entered into a settlement agreement with a majority of the plaintiffs at the Civil Court. On December 20, 2018, the Court of Appeal passed judgment that we had already paid compensation in full in accordance with the settlement agreement, and ordered us to pay compensation with interest to the remaining plaintiffs. We have paid compensation to all plaintiffs in full and no petitions have been submitted to the Supreme Court by any plaintiffs. The case between us and such plaintiffs therefore has become final.

For the cases at Rayong Provincial Court, on September 28, 2018, the Court issued a judgement ordering us to pay damages together with interest amounting to approximately Baht 38 million by deducting payments already paid to the plaintiffs of Baht 24.0 million. We deposited the amount of the remaining damages together with interest with the Rayong Provincial Court on February 25, 2019. Some plaintiffs filed an appeal with the Rayong Provincial Court and we filed an answer to the appeal with the Rayong Provincial Court on October 2, 2019. Finally on September 1, 2020, the Court of Appeal Region 2 issued a judgement ordering us to pay damages with interest to the plaintiffs. We deposited the amount of THB25.0 million with the Rayong Provincial Court on September 30, 2020.

Rayong Provincial Court has granted an extension for the Dika appeal period to March, 1 2021. As of now, the court has not notified us whether there is any submission of Dika appeal by the plaintiffs.

#### ***Civil litigation against one of our subsidiaries relating to the transfer of rights for the payment of raw materials***

On August 20, 2018, a civil lawsuit was filed against our subsidiary and one of its suppliers as joint defendants for violation of a loan agreement and transfer of claim, with the damages and interest amounting to THB324.7 million. Subsequently on June 10, 2020, the Court of First Instance issued its judgement ordering the

subsidiary to pay damages of approximately THB289.6 million, including interest at the rate of 15% per annum. The case is not yet settled, and the subsidiary filed an appeal on November 25, 2020. Currently, it is in the process of court proceedings.

On February 27, 2019, a financial institution filed a civil lawsuit against the supplier of the subsidiary, director of supplier of the subsidiary and the subsidiary as joint defendants for violation of credit limit agreement, sale of promissory notes, transfer of money, guarantee and forced mortgage, with total damages claimed and interest amounting to THB59.4 million. On October 28, 2019, the plaintiff submitted the motion for permission to withdraw the plaint against the subsidiary and the Court granted such permission and struck the case out of the case-list of the Court.

On September 8, 2020, November 8, 2002 and December 25, 2020, respectively, the subsidiary received summons and copies of a Civil Court complaints of civil lawsuits against, among other defendants, the subsidiary regarding (i) the breach of an agreement concerning the reclaiming of purchase price on raw materials and claiming damages on the total amount of THB595.1 million, (ii) the breach of principal-agent agreements and claiming damages amounting to THB109.4 million, starting from the date of the lawsuit until the date of completion of payment and (iii) the breach of agreements concerning the reclaiming of purchase price on raw materials and claiming damages amounting to THB364.71 million, starting from the date of the lawsuit until the date of completion of payment.

The subsidiary will file testimony with its defense in all three cases in accordance with the applicable law. Since all cases are still under court proceedings, the subsidiary therefore, has not recorded any provision against any losses from such cases.

### **Information Technology**

The majority of our information technology services is provided by our affiliate, PTT Digital, in which we own a 40% shareholding stake. We believe that most of our information technology applications and programs are of industry standard and used widely in the global petrochemical and other information technology applications industries.

## MANAGEMENT

### Board of Directors

Our Board of Directors has ultimate responsibility for the administration of the affairs of our Company. Our Articles of Association provide for a Board of Directors of at least five but no more than fifteen directors, with a minimum of three independent directors who must account for at least one-third of the composition of the Board of Directors. At least half of our directors must reside in Thailand and all directors must meet the other eligibility requirements specified under our Articles of Association and applicable Thai rules and regulations with her/his age not exceeding 70 years. As of the date of this Offering Memorandum, our Board of Directors consists of fifteen members, 14 of whom are non-executive directors. Out of the 14 non-executive directors, eight are independent directors. Our Articles of Association require the Board of Directors to hold a meeting at least once every three months.

The following table sets out our current directors, their position(s) and age on the Board of Directors and Sub-Committees as of the date of this Offering Memorandum.

Name	Position	Age	Appointment Date
Mr. Piyasvasti Amranand	Chairman of the Board of Directors; Chairman of the Independent Directors	67	April 9, 2018
Mr. Apisak Tantivorawong	Independent Director; Chairman of the Audit Committee	67	January 24, 2020
Professor Somkit Lertpaithoon	Independent Director; Chairman of the Corporate Governance Committee	61	April 9, 2018
Mr. Don Wasantapruek	Independent Director; Chairman of the Nomination and Remuneration Committee	62	November 1, 2015
Mr. Krissada Boonrach	Independent Director; Chairman of the Risk Management Committee	63	June 2, 2020
Mr. Pakorn Nilrapunt	Independent Director; Director to the Audit Committee	52	April 9, 2018
Mrs. Watanan Petersik	Independent Director; Director to the Corporate Governance Committee and Director to the Audit Committee	60	September 22, 2014
Mr. Prapas Kong-ied	Director; Director to the Corporate Governance Committee	59	November 1, 2019
Major General Nithi Chungcharoen	Independent Director; Director to the Corporate Governance Committee and Director to the Nomination and Remuneration Committee	50	September 22, 2014
Mr. Wittawat Svasti-xuto	Director; Director to the Nomination and Remuneration Committee	59	February 19, 2018
Mr. Sarawut Kaewtathip	Director; Director to the Risk Management Committee	46	July 20, 2020
Mr. Disathat Panyarachun	Director; Director to the Risk Management Committee	56	October 22, 2018
Mrs. Arawadee Photisarao	Director; Director to the Risk Management Committee	59	October 22, 2018
Mr. Chansin Treenuchagron	Director; Director to the Corporate Governance Committee	60	September 21, 2020
Mr. Kongkrapan Intarajang	Director and Secretary to the Board of Directors; Director to the Risk Management Committee; Chief Executive Officer	53	October 1, 2019

**Mr. Piyasvasti Amanand** was appointed Chairman on April 9, 2018, and is Chairman of the Independent Director. Mr. Amanand concurrently holds the positions of Independent Director and Chairman of the Audit Committee of Kasikornbank Public Company Limited and Independent Director and Chairman of the Audit Committee of Pruksa Public Company Limited. He is also Chairman of the Energy for Environment Foundation and a Council Member of The Heart Foundation of Thailand under the Royal Patronage. Mr. Amanand

previously held the positions of Minister of the Ministry of Energy, Chief Advisor to the Chief Executive Officer of Kasikorn Public Company Limited, and President of Thai Airways International Public Company Limited. Mr. Amanand received a Bachelor's degree in Mathematics from the University of Oxford, U.K., a Master's degree in Economics from the London School of Economics and Political Science, U.K., and a Doctoral degree in Economics from the London School of Economics and Political Science, U.K.

**Mr. Apisak Tantivorawong** was appointed as an Independent Director and Chairman of the Audit Committee on January 24, 2020. Mr. Apisak holds a Bachelor's degree in Chemical Engineering from Chulalongkorn University, Thailand, and a Master's degree in Business Administration (Industrial Management) from University of Tennessee, U.S.

**Professor Somkit Lertpaithoon** was appointed as an Independent Director on April 9, 2018 and also serves as Chairman of the Corporate Governance Committee. He concurrently holds the positions of Member of the B.E. 2550 Constitution Drafting Council, Member and Secretary of the Steering Committee of the B.E. 2550 Constitution Drafting Council, Honorary Board Member of the King Prajadhipok's Institute, Member of the National Legislative Assembly and Professor of Faculty of Law at Thammasat University. He is also on the Reform Commission of Thailand on Process of Judgment. Professor Dr. Lertpaithoon was previously Rector at Thammasat University and Director of the Government Pharmaceutical Organization. Professor Dr. Lertpaithoon received a Bachelor's degree in Law from Thammasat University, Thailand, and a Doctoral degree from L'Université de Droit d'Économie et de Sciences Sociales de Paris II, France.

**Mr. Don Wasantapruek** was appointed as an Independent Director on November 1, 2015, and also serves as Chairman of the Nomination and Remuneration Committee. Mr. Wasantapruek also serves as an Independent Director and Chairman of the Nomination Committee of PTT Public Company Limited. Previously, he was self-employed, a Member of the Corporate Governance Committee of PTT Public Company Limited and Director to the Corporate Governance Committee of PTT Global Chemical Public Company Limited. Mr. Wasantapruek holds a Bachelor's degree and a Master's degree in Industrial Engineering from the University of New South Wales, Australia.

**Mr. Krissada Boonrach** was appointed as an Independent Director on June 2, 2020 and also serves as Chairman of the Risk Management Committee. Mr. Boonrach also serves as Committee Member, Sai Jai Thai Foundation Under Royal Patronage. Previously, he served as Minister of the Ministry of Agriculture and Cooperative, Chairman of National Reform Committee for Public Administration, Office of the National Economic and Social Development Council, Permanent Secretary for Interior, Ministry of Interior and Director-General of the Department of Provincial Administration, Ministry of Interior. Mr. Boonrach holds a Bachelor's degree in Law from Chiang Mai University, a Bachelor's degree in Political Science from Ramkhamhaeng University and a Master's degree in Political Science from Thammasat University.

**Mr. Pakorn Nilrapant** was appointed as an Independent Director on April 9, 2018 and is also Director to the Audit Committee. Presently, he is also the Secretary-General of the Office of the Council of State, the Prime Minister's Office and Director of the Strategic Reform Office on the Promotion of the National Reform, Strategy and Cohesion. He previously served as Deputy Secretary-General of the Office of the Council of State, Deputy Director of Prime Minister's Delivery Unit and Secretary-General of Office of the Public Sector Development Commion. Mr. Nilrapant holds a Bachelor's degree in Law from Thammasat University, Thailand, and a Master's degree in Law from the University of Sydney, Australia.

**Mrs. Watanan Petersik** was appointed as an Independent Director on September 22, 2014, and is also Director to the Corporate Governance Committee. She concurrently holds the positions of Independent Director and Chairwoman of the Nomination and Corporate Governance Committee of the CIMB Thai Bank Public Company Limited, and Non-Executive Director of Jetanin Institute for Assisted Reproduction at Jetanin Company Limited. She previously served as Independent Director and Non-Executive Director of CIMB Group Sdn. Bhd., Malaysia, Independent Director and Non-Executive Director of CIMB Group Holding Sdn. Bhd. Mrs. Petersik was previously Senior Advisor at TPG Capital Asia, Member of the Audit Committee of CIMB Thai Bank Public Company Limited, Director of TE Asia Healthcare Partners Pte Ltd., Director of TE Asia Healthcare Advisory Ptd Ltd., Director of TPG Growth III Asia Internet Holdings Ptd Ltd., Director of TPG Growth SF Pte Ltd., and Director of TPG Star SF Pte Ltd. Mrs. Petersik holds a Bachelor's degree from Bryn Mawr College, U.S.

**Mr. Prapas Kong-ied** was appointed as an Independent Director on November 1, 2019 and is also Director to the Audit Committee. He concurrently holds the positions of Director and Chairman of the Corporate Governance Committee of Dhipaya Insurance Public Company Limited and Director and Member of the Corporate Social Responsibility Committee of The Siam Commercial Bank Public Company Limited. Mr. Prapas



received a Bachelor's degree in Law (Second Class Honour) from Ramkhamhaeng University, Thailand and an International Tax Program Certificate and Master of Laws (ITP/LL.M.) from Harvard Law School, Harvard University, U.S. He also is a Barrister-at-Law of the Institute of Legal Education of the Thai Bar.

**Major Colonel Nithi Chungcharoen** was appointed as an Independent Director on September 22, 2014 and also serves as Director to the Corporate Governance Committee. Major Colonel Chungcharoen currently serves as Assistant General Director of the 2<sup>nd</sup> Coordination Centre of the Office of Internal Security Coordination of the Royal Thai Army. Previously, he served as Deputy Defence Attaché in Canberra, Australia, Deputy Chief of Staff of the 11<sup>th</sup> Army Circle and Attaché to the Directorate of Intelligence. Major Colonel Chungcharoen holds a Bachelor of Science from Chulachomklao Royal Military Academy, Thailand, and a Master's degree in Mechanical Engineering from Stevens Institute of Technology, U.S.

**Mr. Wittawat Svasti-xuto** was appointed as Director in February 19, 2018, and is also Director to the Nomination and Remuneration Committee. He concurrently holds the positions of Chief Technology and Engineering Officer of PTT Public Company Limited, Director and Member of the Nomination and Remuneration Committee and Member of the Risk Management Committee of GPSC and Chairman of PTT Energy Solutions Company Limited. Mr. Svasti-xuto previously held the positions of Director of District Cooling System and Power Plant Company Limited, Senior Executive Vice President of Innovation and Digital at PTT Public Company Limited, Director of Energy Complex Company Limited, Director of Business Services Alliance Company Limited, Senior Executive Vice President of Sustainability Management and Project Engineering at PTT Public Company Limited, Senior Executive Vice President of Sustainability Management at PTT Public Company Limited, Executive Vice President of Downstream Business Group Alignment of PTT Public Company Limited and Executive Vice President of Strategy Management of Downstream Business Unit of PTT Public Company Limited. Mr. Svasti-xuto holds a Bachelor's degree in Chemical Engineering from Chulalongkorn University, Thailand, and a Master's degree in Industrial Engineering from The University of Rhode Island, U.S.

**Mr. Sarawut Kaewtathip** was appointed as Director in July 20, 2020 and is also Director to the Risk Management Committee. Mr. Kaewtathip also serves as Director General of the Department of Mineral Fuels, Ministry of Energy. He has previously held the positions of Director of PTT Public Company Limited, Director and Member of the Enterprise Risk Management Committee, PTT Oil and Retail Business Public Company Limited, Deputy Permanent Secretary, Office of the Permanent Secretary Ministry of Energy, Deputy Director-General, Department of Mineral Fuels and Strategy Planning Division, Bureau of Policy and Strategy, Office of the Permanent Secretary, Ministry of Energy. Mr. Kaewtathip holds a Bachelor's degree in Chemical Engineering from California State Polytechnic University, U.S., a Master's degree in Chemical Engineering from the University of Southern California, U.S. and a Doctor of Philosophy (Ph.D.) in Chemical Engineering from the University of Southern California, U.S.

**Mr. Disathat Panyarachun** was appointed as Director on October 22, 2018, and is also Director to the Corporate Governance Committee. Mr. Panyarachun also serves as Senior Executive Vice President of the International Trading Business Unit at PTT Public Company Limited, Chairman of PTT International Trading London Ltd. and Chairman of PTT International Trading Pte. Ltd. He has previously held the positions of Chairman of PTT International Trading DMCC, Executive Vice President of International Trading of PTT Public Company Limited, Vice President acting as Executive Vice President of International Trading at PTT Public Company Limited and Vice President of PTT Public Company Limited. Mr. Panyarachun holds a Bachelor's degree in Social Science from Silpakorn University, Thailand, and a Master's degree in Political Science from the National University of San Diego, U.S.

**Mrs. Arawadee Photisaro** was appointed as Director in October 22, 2018, and is also Director to the Risk Management Committee. Mrs. Photisaro also serves as Senior Executive Vice President of Corporate Strategy of PTT Public Company Limited and Chairwoman of Sakri Resources Limited. She previously held the positions of Executive Vice President of PTT Public Company Limited, Executive Vice President of Strategy and Portfolio Management and Director of the Espresso Project at PTT Public Company Limited and Executive Vice President of Strategy and Portfolio Management of PTT Public Company Limited. Mrs. Photisaro holds a Bachelor's degree in Accounting from Thammasat University, Thailand, and a Master of Business Administration from the University of Dallas, U.S.

**Mr. Chansin Treenuchagron** was appointed as Director on September 21, 2020 and is also Director to the Corporate Governance Committee. Mr. Treenuchagron also serves as Director and Acting President, Thai Airways International Public Company Limited, Chairman of Y.S.S. (Thailand) Company Limited and President, Thammasat Association. He previously held the positions of Chairman, IRPC Public Company Limited President and Chief Executive Officer / Director / Secretary to the Board, PTT Public Company Limited, Director, PTT

Exploration and Production Public Company Limited, Chief Technology and Engineering Officer, PTT Public Company Limited, Chairman, PTT Digital Solutions Company Limited, Director / Member of Risk Management Committee / Member of Nomination and Remuneration Committee, Global Power Synergy Public Company Limited, Member of the Risk Management Committee, IRPC Public Company Limited, Director, IRPC Public Company Limited, Chief Operating Officer, Infrastructure and Sustainability Management Business Group, PTT Public Company Limited, Chairman, PTT Asahi Chemical Company Limited, Senior Executive Vice President, Downstream Business Group Alignment, PTT Public Company Limited, Chairman, PTT Polymer Marketing Company Limited, Chairman, PTT Polymer Logistics Company Limited, Senior Executive Vice President, Petrochemicals & Refining Business Unit, PTT Public Company Limited, Chairman, PTT Green Energy (Thailand) Company Limited Director, Thai Oil Public Company Limited, Senior Executive Vice President, Corporate Strategy, PTT Public Company Limited, Director, PTT Polymer Logistics Company Limited. Mr. Treenuchagron holds a Bachelor's degree in Economics from Thammasat University, a Master's degree in Economics from Chulalongkorn University and an Honorary Doctorate of Science (Technology Management), Thammasat University.

**Mr. Kongkrapan Intarajang** was appointed as Director on October 1, 2019, and is also Secretary to the Board of Directors, Director to the Risk Management Committee and Chief Executive Officer. In addition, Mr. Intarajang currently serves as Senior Executive Vice President reporting to the Chief Operating Officer, Downstream Petroleum Business Group, PTT Public Company Limited, Director and Member of the Risk Management Committee, GPSC, Director of GGC, Chairman of PTTGC America Corporation, Chairman of PTTGC America LLC, Director of PTTGC International Private Limited, Director of GC International Corporation (formerly PTTGC International (USA) Inc.), Member of The Petroleum Institute of Thailand, Co-Chairman of France-Thailand Business Forum, Committee Member of Sustainable Energy Foundation, Committee Member of Kamnoetvidya Science Academy, Honorary Member of Vidyasirimedhi Institute Council, Vice Chairman of Power of Innovation Foundation and Vice Chairman of Power of Learning Foundation. He previously held the positions of Director of Thai Tank Terminal Company Limited, Chief Operating Officer of Upstream Petrochemical Business at PTT Global Chemical Public Company Limited, Director and President and Chief Executive Officer of PTTGC America Corporation, Director of PTTGC International (Netherlands) B.V., Director of Vencorex Holding, Director of Emery Oleochemicals (M) Sdn. Bhd., Director of NatureWorks LLC, Director of GC International Corporation (formerly PTTGC International (USA) Inc.) and Executive Vice President – International Business Operations of PTT Global Chemical Public Company Limited. Mr. Intarajang received a Bachelor's degree in Chemical Engineering from Chulalongkorn University, Thailand, and a Doctor of Philosophy (Ph.D.) in Chemical Engineering from the University of Houston, U.S.

The business address of all our directors is our registered office.

Under our Articles of Association, directors serve a maximum term of three years. At every annual general meeting, one-third of the directors must retire from office. The directors to retire during the first and second years after our incorporation are to be drawn by lots. In subsequent years, directors who have been in office for the longest period will retire. However, a director whose term in the office expires can be re-elected.

### **Sub-Committees**

Our Board of Directors has four Sub-Committees: the Audit Committee, the Nomination and Remuneration Committee, the Corporate Governance Committee and the Risk Management Committee. All Sub-Committees report directly to our Board of Directors. Members of these Sub-Committees are appointed by the Board of Directors from time to time.

#### ***Audit Committee***

The Audit Committee consists of at least three Independent Directors and must be qualified under the criteria prescribed by the Capital Market Supervisory Board of Thailand and the SET. The Committee must command adequate knowledge and experience needed to perform its duties on reviewing the integrity of financial statements to be disseminated, providing adequate and efficient internal audit and risk management, selecting the external auditor, and considering transactions with potential conflicts of interest. At least one Independent Director must also have the requisite expertise in accounting and financing. The current members of the Audit Committee (each, an Independent Director) are:

<b>Name</b>	<b>Position</b>
Mr. Apisak Tantivorawong	Chairman of the Audit Committee (Independent Director)

<b>Name</b>	<b>Position</b>
Mr. Pakorn Nilrapunt	Director to the Audit Committee (Independent Director)
Mrs. Watanan Petersik	Director to the Audit Committee (Independent Director)

Mr. Amorn Putiphrawan, Senior Vice President of the Internal Audit Department, serves as secretary to the Audit Committee.

Each Committee member serves a term of three years and may be terminated by resignation, removal by the Board of Directors, or termination of directorship. However, members may be re-appointed by the Board of Directors. The Audit Committee has the responsibilities set out below.

#### *Financial Reports and External Audit*

The Audit Committee oversees our financial reporting and external audit. In this role, the Audit Committee has the responsibilities set out below:

- reviewing the accuracy, creditability, and sufficient disclosure of our financial reports and ensuring our compliance with the accounting standards, laws, and relevant standards;
- considering, selecting, and appointing the external auditor, and recommending remuneration for the auditor for approval by the Board of Directors; and
- encouraging independence and providing an opinion on the suitability of the external auditor to the Board of Directors.

#### *Internal Controls*

The Audit Committee oversees our internal controls. In this role, the Audit Committee has the responsibilities set out below:

- reviewing the adequacy and effectiveness of our internal control system;
- reviewing the appropriateness of our risk management system and risk measurement procedures; and
- reviewing our internal whistleblowing procedures concerning incident reports and complaints.

#### *Internal Audit*

The Audit Committee oversees our internal audit functions. In this role, the Audit Committee has the responsibilities set out below:

- reviewing the adequacy and effectiveness of our internal audit system and ensuring compliance with the internal audit standards of the Office of the Internal Audit Department.
- overseeing the independence of the Internal Audit Department;
- reviewing the appointment and replacement, and evaluating the performance of, the head of the Internal Audit Department;
- reviewing and approving the charter of the Internal Audit Department;
- approving and evaluating annual internal audit plans to ensure consistency with our types and levels of risks;
- jointly reviewing and examining audit results with the Internal Audit Department;
- developing understanding among the Audit Committee, our management, the Internal Audit Department and our external auditors in order to ensure coordination; and
- reviewing the scope of the audit with our external auditors to ensure consistency and coordination.

#### *Compliance with the Law and Related Regulations*

The Audit Committee oversees our compliance with applicable laws and regulations. In this role, the Audit Committee has the responsibilities set out below:

- reviewing our activities to ensure compliance with the laws of the Securities and Exchange Act of Thailand and the requirements of the Thai SEC and the SET, and any other laws relevant to our businesses; and

- reviewing connected transactions or transactions that may lead to conflicts of interest to ensure that they conform to the law and regulations of the Thai SEC, the Capital Market Supervisory Board, and the SET, and that they are reasonable and to our benefit.

#### *Reporting*

The Audit Committee oversees our audit reporting. In this role, the Audit Committee has the responsibilities set out below:

- preparing the Audit Committee’s report, which is signed by the Chairman of the Audit Committee, for inclusion in the annual report, with information as required by the SET; and
- reporting its performance to the Board of Directors.

In performing its duties, if any transaction or incident potentially affecting our financial condition and performance is found or suspected, the Audit Committee must report the concern to the Board of Directors for rectification within the period the Audit Committee considers appropriate. Those transactions and incidents include:

- any transaction which causes conflicts of interest;
- any fraud, irregularity, or significant defect in the internal control system; and
- any violation of the rules and regulations of the Securities and Exchange Act of Thailand and the SET, and any other laws relating to our business.

If the Board of Directors or the executives fail to rectify a transaction or incident within an appropriate period, the Audit Committee may report the transaction or incident to the Office of the Thai SEC or the SET, as applicable.

#### *Other Duties*

Other duties of the Audit Committee include procuring advice from external independent advisers where necessary, reviewing the charter of the Audit Committee and proposing any revisions of such charter to the Board of Directors for approval, and performing other Board-assigned duties.

The Audit Committee is required to hold a non-management meeting with the external auditor at least once a year.

#### ***Nomination and Remuneration Committee***

The Committee consists of at least three directors, and more than half of them must be Independent Directors. The Chairman of the Nomination and Remuneration Committee must be an Independent Director. The Committee is responsible for the recruitment and nomination of candidates to positions on the Board of Directors and to the position of the Chief Executive Officer for consideration and approval by shareholders, as well as defining criteria and principles on the remuneration and compensation of the directors and the Chief Executive Officer.

The current members of the Nomination and Remuneration Committee are:

<b>Name</b>	<b>Position</b>
Mr. Don Wasantapruet	Chairman of the Nomination and Remuneration Committee (Independent Director)
Mr. Wittawat Svasti-xuto	Director to the Nomination and Remuneration Committee
Major General Nithi Chungcharoen	Director to the Nomination and Remuneration Committee (Independent Director)

Mrs. Pilasphan Udomjarumanee, Senior Vice President of Corporate Secretary and Legal, serves as secretary to the Nomination and Remuneration Committee.

Each Committee member serves a term of three years and may be terminated by resignation, removal by the Board of Directors, or termination of directorship. However, members may be re-appointed by the Board of Directors.

The Nomination and Remuneration Committee has the responsibilities set out below:

- selecting individuals eligible for nomination as new directors or to the office of the Chief Executive Officer using structured and transparent screening and nomination criteria for subsequent nomination to the Board of Directors and/or shareholders at the annual general meeting for their approval;
- defining criteria and principles for fair and reasonable remuneration and compensation to directors and the Chief Executive Officer and submitting remuneration and compensation proposals for approval at meetings of the Board of Directors or our shareholders; and
- performing other Board-assigned duties.

#### *Reporting*

The Nomination and Remuneration Committee reports to the Board of Directors and publishes a Nomination and Remuneration Committee report, which is signed by the Chairman of the Nomination and Remuneration Committee, to be included in the annual report of the Company.

#### ***Corporate Governance Committee***

The Committee consists of at least three directors, and more than half of them must be Independent Directors. The Chairman is required to be an Independent Director and is responsible for making recommendations to the Board of Directors on the Code of Conduct and Business Ethics under our corporate governance principles to ensure standard and proper implementation.

The current members of the Corporate Governance Committee are:

<b>Name</b>	<b>Position</b>
Professor Somkit Lertpaithoon	Chairman of the Corporate Governance Committee (Independent Director)
Major General Nithi Chungcharoen	Director to the Corporate Governance Committee (Independent Director)
Mrs. Watanan Petersik	Director to the Corporate Governance Committee (Independent Director)
Mr. Prapas Kong-ied	Director to the Corporate Governance Committee
Mr. Chansin Treenuchagron	Director to the Corporate Governance Committee

Mrs. Pilasphan Udomjarumane, Senior Vice President of Corporate Secretary and Legal, serves as secretary to the Corporate Governance Committee.

Each Committee member serves a term of three years and may be terminated by resignation, removal by the Board of Directors, or termination of directorship. However, members may be re-appointed by the Board of Directors.

The Corporate Governance Committee has the responsibilities set out below:

- recommending, in accordance with principles of good corporate governance, policies and practices concerning ethics and business code of conduct to the Board of Directors and the management for implementation;
- monitoring, advising, evaluating, and reviewing corporate governance policies, principles and code of conduct in order to align our corporate governance system with international standards; and
- performing other Board-assigned duties.

#### *Reporting*

The Corporate Governance Committee reports to the Board of Directors and publishes a Corporate Governance Committee report, which is signed by the Chairman of the Corporate Governance Committee, to be included in the annual report of the Company.

### ***Risk Management Committee***

The Committee consists of at least three directors, one of whom must be an Independent Director. The committee defines principles of risk management and provides recommendations on risk management involving our operations to ensure adequacy and effectiveness, oversees the risk management system and processes to properly reduce the impact of risks to our business, and monitors and evaluates compliance with the risk management framework to ensure its adequacy and effectiveness. The current members of the Risk Management Committee are:

<b>Name</b>	<b>Position</b>
Mr. Krissada Boonrach	Chairman of the Risk Management Committee (Independent Director)
Mr. Sarawut Kaewtathip	Director to the Risk Management Committee
Mrs. Arawadee Photisaro	Director to the Risk Management Committee
Mr. Disathat Panyarachun	Director to the Risk Management Committee
Mr. Kongkrapan Intarajang	Director to the Risk Management Committee

Miss Kanoknun Buranapunsri, Acting Vice President of Corporate Risk Management and Internal Control System, serves as secretary to the Risk Management Committee.

Each committee member serves a term of three years and may be terminated by resignation, removal by the Board of Directors, or termination of directorship. However, members may be re-appointed by the Board of Directors.

#### ***Reporting***

The Risk Management Committee reports to the Board of Directors. Additionally, the Risk Management Committee is also responsible to third parties for the operation of the Company as well.

The Risk Management Committee has the responsibilities set out below:

- defining policies and recommendations on risk management involving our business to ensure adequacy and effectiveness;
- defining risk management plans and risk management processes for the entire organization;
- monitoring and evaluating compliance with the risk management framework of the entire organization; and
- performing Board-assigned duties and duties stipulated by applicable regulations.

#### **Chief Executive Officer**

The Company's Articles of Association require that the Board of Directors nominate and appoint one Director as Chief Executive Officer and Secretary to the Board of Directors. The Chief Executive Officer manages the business of the Company in accordance with the policies, plans and budget approved by the Board of Directors. He or she is the highest-ranking officer of the Company and supervises and directs all other employees and staff of the Company.

#### **The Management**

The Company is principally managed by certain executives that comprise the management team, including the Chief Executive Officer, the President, the Executive Vice Presidents and the Senior Vice Presidents, which is responsible for determining strategy and reviewing policies of the Company. The management team is also responsible for managing the affairs of the Company in accordance with the policies established by the Board of Directors.

Our executive officers, from the level of Executive Vice President up to the Chief Executive Officer, are appointed from time to time by a majority vote of our Board of Directors. The following table sets out our current executive officers, their position(s) and age as of December 31, 2020.

<b>Name</b>	<b>Position</b>	<b>Age</b>	<b>Appointed since</b>
Mr. Kongkrapan Intarajang	Chief Executive Officer	53	October 1, 2019
Mr. Patiparn Sukorndhaman	President	59	October 1, 2019
Mr. Varit Namwong	Chief Operating Officer, Center of Excellence	57	October 1, 2016
Mr. Toasaporn Boonyapipat	Senior Executive Vice President, Upstream Petrochemical Business	55	January 1, 2021
Mr. Wiboon Chuchepchankamon	Senior Executive Vice President, Downstream Petrochemical Business/ Acting Senior Vice President, Green Chemicals Business Unit	58	October 1, 2020
Mrs. Warawan Tippawanich	Executive Vice President, Corporate Strategy	57	October 1, 2020
Mr. Saroj Putthammawong	Executive Vice President, Marketing, Commercial and Supply	52	October 1, 2019
Mr. Narongsak Jivakanun	Executive Vice President, International Business Operations	52	October 1, 2019
Mr. Pirun Krimwongrut	Executive Vice President, Organizational Effectiveness	52	October 1, 2019
Mr. Pornsak Mongkoltrirat	Executive Vice President, Polymers Business Unit	54	April 1, 2020
Mr. Pukpong Wungrattanasopon	Executive Vice President, Group Performance Center, Olefins	50	April 1, 2020
Ms Pattaralada Sa-ngasang	Executive Vice President, Finance and Accounting	55	January 1, 2021

For details regarding **Mr. Kongkrapan Intarajang**, see “—*Board of Directors*” above.

**Mr. Patiparn Sukorndhaman** was appointed as President on October 1, 2019. He currently serves as Director, Director to the Nomination and Remuneration Committee and Director to the Risk Management Committee of GGC, as well as Chairman of Solution Creation Company Limited, GC Polyols Company Limited, GC Marketing Solutions Company Limited, HMC, GC-MPTA and Thai PET Resin Company Limited. He is also Director of PTT Asahi Chemical Company Limited. Mr. Sukorndhaman has held previous positions as Chairman of GC Oxirane Company Limited, Director of PTT Phenol Company Limited, Chairman of GC Glycol Company Limited, Chairman of GC Styrenics Company Limited, Chief Operating Officer of Downstream Petrochemical Business at PTT Global Chemical Public Company Limited, Director and Director to the Nomination and Remuneration Committee of GPSC, Director of Thai Fatty Alcohols Company Limited, Director of PTT Chemical International Private Limited, Executive Vice President of Finance and Accounting at PTT Global Chemical Public Company Limited, Director of PTT ICT Solutions Company Limited and Director of Bio Creation Company Limited. Mr. Sukorndhaman holds a Bachelor’s degree in Political Science (Public Administration – Public Finance) from Chulalongkorn University, Thailand, and a Master of Business Administration (Finance) from The American University, U.S. Mr. Sukorndhaman has had 30 years of experience in the Thai refinery and petrochemical related industries and 30 years of experience within the PTT Group.

**Mr. Varit Namwong** was appointed as Chief Operating Officer, Center of Excellence on October 1, 2016. He concurrently serves as Chairman of NPC Safety and Environmental Service Company Limited,

Chairman of GC Maintenance and Engineering Company Limited. He also holds the position of Director at GC Marketing Solutions Company Limited, HMC, PTTGC America Corporation and PTTGC America LLC. Mr. Namwong previously served as Director of PTT Energy Solutions Company Limited, Director of Sport Services Alliance Limited and Executive Vice President of Organizational Effectiveness of PTT Global Chemical Public Company Limited. He was also Director of Vencorex Holding, Eastern Fluid Transport Company Limited, PTT ICT Solutions Company Limited, Solution Creation Company Limited, TOC Glycol Company Limited, Myriant Corporation and Thai Styrenics Company Limited. Mr. Namwong holds a Bachelor's degree in Business Administration from Assumption Business Administration College, Thailand, and a Master of Business Administration from Ramkhamhaeng University, Thailand.

**Mr. Toasaporn Boonyapipat** was appointed as Senior Executive Vice President, Upstream Petrochemical Business, on January 1, 2021. He also serves as Director of GPSC, Chairman of GC Estate Company Limited, Director of GC Maintenance and Engineering Company Limited and Director of Thai Tank Terminal Limited. Mr. Boonyapipat previously held the positions of Executive Vice President – reporting to Chief Executive Officer, PTT Global Chemical Public Company Limited appointed as Secondment to PTTGC America LLC, Director, PTTGC America LLC, Director, Emery Oleochemicals (M) Sdn. Bhd., Director, Emery Specialty Chemicals Sdn. Bhd., President and CEO, PTTGC America LLC, Director, PTTGC International (Netherlands) B.V., Director, Vencorex Holding, Director, GC Ventures Company Limited, Director and Chief Executive Office, PTTGC International Private Limited, Executive Vice President – International Business Operations, PTT Global Chemical Public Company Limited appointed as Secondment to PTTGC America LLC and Senior Vice President reporting to Executive Vice President - International Business Operations, PTT Global Chemical Public Company Limited appointed as Secondment to PTTGC America LLC. Mr. Boonyapipat holds a Bachelor's of Engineering Degree from Chiang Mai University, Thailand and Master of Business Administration from Burapha University, Thailand.

**Mr. Wiboon Chuchepchankamon** was appointed as Acting Senior Executive Vice President, Downstream Petrochemical Business and Acting Senior Vice President, Green Chemicals Business Unit on October 1, 2019. He also serves as Director, Vice Chairman of the Board of Directors and Member of the Nomination and Remuneration Committee of VNT, Chairman of GC Glycol Company Limited, GC Oxirane Company Limited and Revolve Group Limited as well as Director of PTT Phenol Company Limited, Solution Creation Company Limited, GC Marketing Solutions Company Limited, GC-M PTA, HMC, Kuraray GC Advance Materials Company Limited and Thai PET Resin Company Limited. Mr. Chuchepchankamon has held previous positions of Chairman of GC Styrenics Company Limited, GC Logistics Solutions Company Limited and PL Global Transport Company Limited, Director of GC Styrenics Company Limited, Director and Managing Director of TOC Glycol Company Limited as well as Senior Vice President of Polymers Business Unit, Senior Vice President of Downstream Petrochemical Business, Senior Vice President of EO-Based Performance Business Unit and Vice President of Production – Olefins II at PTT Global Chemical Public Company Limited. Mr. Chuchepchankamon holds a Bachelor's degree in Electrical Engineering as well as Master of Management from Sasin Graduate Institute of Business Administration and Master of Science (Petroleum and Petrochemical) from Petroleum and Petrochemical College at Chulalongkorn University, Thailand.

**Mrs. Warawan Tippawanich** was appointed as Executive Vice President, Corporate Strategy on October 1, 2019. Mrs. Warawan Tippawanich is also the Director of GC-M PTA, Thai PET Resin Company Limited, GC Polyols Company Limited, GC Ventures Company Limited, Solution Creation Company Limited, PTTGC America Corporation, PTTGC America LLC and GC Ventures America Corporation. Mrs. Tippawanich previously held the positions of Director of GC Glycol Company Limited and Sarn Palung Social Enterprise Company Limited as well as Senior Vice President, Corporate Affairs and Corporate Strategy and Vice President, Corporate Governance and Corporate Secretary of PTT Global Chemical Public Company Limited. Mrs. Tippawanich received both her Bachelor's degree in Chemical Engineering and Master of Business Administration from Chulalongkorn University, Thailand.

**Mr. Saroj Putthammawong** was appointed as Executive Vice President, Marketing, Commercial and Supply on October 1, 2019. He is also the Director of GC Glycol Company Limited, GC Marketing Solutions Company Limited, GC Oxirane Company Limited and GC Treasury Center Company Limited as well as Executive Committee Member of HMC. Mr. Putthammawong previously held the positions of Director of GC Logistics Solutions Company Limited, Solution Creation Company Limited and Thai Tank Terminal Limited as well as Senior Vice President of Marketing, Commercial and Supply, Vice President of Marketing Strategy, Vice President of Supply Sourcing of PTT Global Chemical Public Company Limited. Mr. Putthammawong holds a Bachelor's degree in Chemical Engineering from Chulalongkorn University, Thailand and a Master of Business Administration from Thammasat University, Thailand.



**Mr. Narongsak Jivakanun** was appointed as Executive Vice President, International Business Operations on October 1, 2019. He is also the Chairman of GC Ventures Company Limited and GC Ventures America Corporation, Director and Managing Director of PTTGC International Private Limited, PTTGC America Corporation and GC International Corporation (formerly PTTGC International (USA) Inc.), Director of PTTGC America LLC, PTTGC Innovation America Corporation, NatureWorks LLC, PTTGC International (Netherlands) B.V., Vencorex Holding and Soem Kit Textile Company Limited as well as Director and Executive Committee of Emery Oleochemicals (M) Sdn. Bhd. and Emery Specialty Chemicals Sdn. Bhd. Mr. Jivakanun previously held the positions of Director, Vice Chairman and Director to the Nomination and Remuneration Committee of VNT, Director of GC Polyols Company Limited, Director and Director to the Risk Management Committee of GGC, Chairman of GC Estate Company Limited, Director of PTT Phenol Company Limited, Executive Vice President of Corporate Strategy of PTT Global Chemical Public Company Limited, Chairman of PTT MCC Biochem Company Limited, Director of PTT Digital Solutions Company Limited, Director of Myriant Corporation, Director of PTT Chemical International Private Limited, Director of PTT Chemical International (Asia Pacific ROH) Company Limited, Senior Vice President of Corporate Strategy of PTT Global Chemical Public Company Limited, Director of Emery Oleochemicals (M) Sdn. Bhd., Director of Emery Specialty Chemicals (M) Sdn. Bhd., Director of Bio Spectrum Company Limited, Senior Vice President of International Strategy and Business Development reporting to Executive Vice President of International Business Operations of PTT Global Chemical Public Company Limited, Chief Executive Officer of PTT Chemical International Private Limited, Chief Executive Officer of PTT Chemical International (Asia Pacific ROH) Company Limited, Director of PTTGC International (Netherlands) B.V., Director of Vencorex Holding and Director of Bio Creation Company Limited. Mr. Jivakanun received his Bachelor's degree in Chemical Engineering from Chulalongkorn University, Thailand, and a Master's degree in Chemical Engineering from Oregon State University, U.S.

**Mr. Pirun Krimwongrut** was appointed as Acting Executive Vice President, Organizational Effectiveness on October 1, 2019. He is also the Director of GC Styrenics Company Limited, GC Estate Company Limited, PTT Digital Solutions Company Limited and Sport Services Alliance Company Limited. Mr. Krimwongrut previously held the positions of Director of Thai Tank Terminal Limited and Eastern Fluid Transport Company Limited as well as Senior Vice President and Acting Senior Vice President of Group Performance Center – Utilities, Vice President of GPC Strategy & Business Development, Upstream Petrochemical Business and Vice President of Technical Standard and Policy of PTT Global Chemical Public Company Limited. Mr. Krimwongrut holds a Bachelor's degree in Electrical Engineering from Khon Kaen University, Thailand and a Master's degree in Electrical Engineering from University of New South Wales, Australia.

**Mr. Pornsak Mongkoltrirat** was appointed as Acting Executive Vice President, Polymers Business Unit on October 1, 2019. He is also the Executive Committee of HMC, Executive Board of PTT Asahi Chemical Company Limited. He concurrently serves as Chairman of GC Logistics Solutions Company Limited, GC Styrenics Company Limited, Envicco Limited and PL Global Transport Company Limited as well as Director of GC Marketing Solutions Company Limited and GC Maintenance and Engineering Company Limited. Mr. Mongkoltrirat previously held the positions of Director of GC-M PTA and Thai PET Resin Company Limited as well as Director and Managing Director of GC Glycol Company Limited. He also acted as Senior Vice President and Acting Senior Vice President of EO-Based Performance Business Unit, Acting Vice President of Strategy and Business Development, Polymer Business Unit as well as Vice President of LDPE Plant 1, Polymer Business Unit of PTT Global Chemical Public Company Limited. Mr. Mongkoltrirat received both his Bachelor's degree in Mechanical Engineering and Master of Business Administration from Kasetsart University, Thailand.

**Mr. Pukpong Wungrattanasopon** was appointed as Acting Executive Vice President, Group Performance Center, Olefins on October 1, 2019. Mr. Wungrattanasopon also serves as Director of PTT Phenol Company Limited and Thai Tank Terminal Limited. He previously held the positions of Senior Vice President, Group Performance Center, Aromatics and Vice President, Technology of PTT Global Chemical Public Company Limited. Mr. Wungrattanasopon received his Bachelor's degree in Chemical Technology from Chulalongkorn University, Thailand and Master's degree in Petrochemical Technology from The Petroleum and Petrochemical College of Chulalongkorn University, Thailand.

**Ms. Pattaralada Sa-ngasang** was appointed as Executive Vice President, Finance and Accounting on January 1, 2021. Ms. Sa-ngasang also serves as Executive Vice President under the Chief Financial Officer of PTT Public Company Limited, Chairman, GC Treasury Center Company Limited and Director of GC Polyols Company Limited, GC Oxirane Company Limited, PTTGC Innovation America Corporation, GC International Corporation, PTTGC International Private Limited, PTTGC America Corporation, PTTGC America LLC, Emery Oleochemicals (M) Sdn. Bhd., Emery Specialty Chemicals Sdn. Bhd. And Vencorex Holding. She previously held the positions of Executive Vice President – Finance and Accounting, Thai Oil Public Company Limited,

Chairperson, Thailoil Treasury Center Company Limited and was Director of Ubon Bio Ethanol Public Company Limited, Thailoil Energy Services Company Limited, Thailoil Ethanol Company Limited and Saphthip Company Limited as well as Senior Vice President – Financial Planning, Thai Oil Public Company Limited. Ms. Sangsang received her Bachelor's degree in Accounting and a Master of Business Administration from Thammasat University, Thailand and a Mini Master of Business Administration from the National Institute of Development Administration, Thailand.

## **Corporate Governance and Management Practices**

### ***Corporate Governance***

We review our corporate governance principles and practices and implement new principles and practices to improve our corporate governance from time to time. We have adopted a revised set of good corporate governance principles that apply to our directors and employees. Our principles of good corporate governance are generally based on the principles of good corporate governance established by the SET and address a range of matters, including establishing procedures and requirements relating to the following:

- duties, responsibilities, qualifications and ethics with respect to the Board of Directors;
- responsibilities to shareholders, employees, society and the environment;
- relationships with customers, trading partners, and competitors;
- codes of conduct for executives and employees;
- internal controls and risk management; and
- information disclosure and transparency.

Our principles of good corporate governance also set out our policies and guidelines on matters relating to human resource management, accounting and financial matters, internal controls, conflict of interests, confidentiality, insider trading, use of our information technology system, safety and occupational health, environmental and procurement practices.

### ***Management Practices***

We have adopted certain management practices, which focus on good management, responsibility to our shareholders and codes of conduct. We have systems to implement our management practices and committees at the operational level to implement and review these systems.

We have implemented various policies, systems and committees to fulfill our responsibilities to four stakeholder groups, namely, our shareholders, customers and suppliers, employees, and society and the environment.

We have adopted a management code of conduct and an employees' code of conduct to set out relevant rights and obligations.

### ***Awards and Recognitions***

We have received numerous awards and recognitions, including:

- ranked as No.1 in the Dow Jones Sustainability Indices (DJSI) in Chemicals Sector for the second consecutive year in 2020, the only Thai company in the chemicals sectors to be ranked No. 1 for two consecutive years;
- awarded the S&P Global Sustainability Award Gold Class 2021, the only company in the chemicals sector of Asia to receive this award; and
- achieved status as the first and only Thai conglomerate on the A List 2020 for Climate Change and for Water Security of the Carbon Disclosure Project (CDP).

In addition, we were recognized as a UN Global Compact LEAD company in 2020, the first company in Thailand to achieve this recognition and we ranked in the Top 3 of the FTSE4Good Index in 2020 and in the Top 5 in the MSCI 2020. We also received an "Excellence" score in the Low Carbon and Sustainable Business Index (LCSI) for two consecutive years, were recognized on the Thailand Sustainability Investment list for six consecutive years in 2020, and received a Distinguished award in Sustainable development excellence category at the Thailand Corporate Excellence Awards in 2020.

## Share Ownership and Compensation

Our directors and executive officers named above held in aggregate approximately 0.004% of our share capital as at December 31, 2020. The total remuneration (salaries, discretionary bonuses and directors' fees) expenses to our directors and top executive officers as a group was approximately THB 152.5 million (US\$5.08 million) for the year ended December 31, 2020.

Each of our independent directors is subject to a 0.5% maximum shareholding limit pursuant to our Articles of Association.

The tables below set forth the shareholdings of our directors and executive officers as of December 31, 2020.

### *Shareholdings of Directors*

<b>Name</b>	<b>Position</b>	<b>No. of shares</b>
Mr. Piyasvasti Amranand	Chairman of the Board of Directors; Chairman of the Independent Directors	—
Mr. Apisak Tantivorawong	Independent Director; Chairman of the Audit Committee	—
Professor Somkit Lertpaithoon	Independent Director; Chairman of the Corporate Governance Committee	—
Mr. Don Wasantapruek	Independent Director; Chairman of the Nomination and Remuneration Committee	—
Mr. Krissada Boonrach	Independent Director; Chairman of the Risk Management Committee	—
Mr. Pakorn Nilprapunt	Independent Director; Director to the Audit Committee	—
Mrs. Watanan Petersik	Independent Director; Director to the Corporate Governance Committee and Audit Committee	—
Mr. Prapas Kong-ied	Director; Director to the Corporate Governance Committee	—
Major General Nithi Chungcharoen	Independent Director; Director to the Corporate Governance Committee and the Nomination and Remuneration Committee	—
Mr. Wittawat Svasti-xuto	Director; Director to the Nomination and Remuneration Committee	3,415
Mr. Sarawut Kaewtathip	Director; Director to the Risk Management Committee	—
Mr. Disathat Panyarachun	Director; Director to the Risk Management Committee	80 (held by spouse)
Mrs. Arawadee Photisarao	Director; Director to the Risk Management Committee	153
Mr. Chansin Treenuchagron	Director; Director to the Corporate Governance Committee	—

<b>Name</b>	<b>Position</b>	<b>No. of shares</b>
Mr. Kongkrapan Intarajang	Director and Secretary to the Board of Directors; Director to the Risk Management Committee; Chief Executive Officer	—

## PRINCIPAL SHAREHOLDERS

The following table sets forth certain information about our principal shareholders and our issued and paid-up share capital, as of May 5, 2020.

Shareholder	Number of common shares	Percentage (%)
PTT Public Company Limited	2,149,920,915	47.68
Thai NVDR Company Limited	278,841,070	6.18
Social Security Office	92,852,651	2.06
HMC <sup>(1)</sup>	83,427,636	1.85
STATE STREET EUROPE LIMITED	80,595,941	1.79
SOUTH EAST ASIA UK (TYPE C) NOMINEES LIMITED	79,813,070	1.77
NORTRUST NOMINEES LIMITED-NT0 SEC LENDING THAILAND CL AC	62,504,178	1.39
The Bank of New York Mellon	61,678,441	1.37
BST <sup>(2)</sup>	43,420,625	0.96
GIC Private Limited	40,494,629	0.90
<b>Total shareholdings of top 10 principal shareholders</b>	<b>2,973,549,156</b>	<b>65.95</b>
<b>Total number of common shares outstanding</b>	<b>4,508,849,117</b>	<b>100.00</b>

*Notes:*

- (1) GC holds 41.44% of HMC.
- (2) BST is a manufacturer of mixed C4 products, such as butadiene, butene-1, MTBE and C4 Raffinates. See “*Business—Our Business Units and Products—Olefins and Derivatives.*”

## FORM OF THE NOTES

Notes may only be issued in registered form.

Each Tranche of Notes in registered form (“Notes”) will be represented by either:

- (i) individual Note Certificates in registered form (“**Individual Note Certificates**”); or
- (ii) one or more unrestricted global note certificates (“**Unrestricted Global Note Certificate(s)**”) in the case of Notes sold outside the United States to non-U.S. persons in reliance on Regulation S (“**Unrestricted Notes**”) and/or one or more restricted global note certificates (“**Restricted Global Note Certificate(s)**”) in the case of Notes sold to persons who are both QIBs and QPs in reliance on Rule 144A (“**Restricted Notes**”),

in each case as specified in the relevant Pricing Supplement, and references in this Offering Memorandum to “Global Note Certificates” shall be construed as a reference to Unrestricted Global Note Certificates and/or Restricted Global Note Certificates.

Each Note represented by a Restricted Global Note Certificate will be registered in the name of Cede & Co. (or such other entity as is specified in the applicable Pricing Supplement) as nominee for DTC or, as the case may be, in the name of the common depository (or its nominee) for Euroclear and/or Clearstream and the relevant Restricted Global Note Certificate will be deposited on or about the issue date with the custodian for DTC (the “**DTC Custodian**”) or a depository of the common depository for Euroclear and/or Clearstream. Beneficial interests in Notes represented by a Restricted Global Note Certificate may be held through DTC or, as the case may be, Euroclear and/or Clearstream at any time.

Each Note represented by an Unrestricted Global Note Certificate will be registered in the name of a common depository (or its nominee) for Euroclear and/or Clearstream and/or any other relevant clearing system or in the name of Cede & Co. as nominee for DTC, and the relevant Unrestricted Global Note Certificate will be deposited on or about the issue date with the common depository or the DTC Custodian.

If the relevant Pricing Supplement specifies the form of Notes as being “Individual Note Certificates,” then the Notes will at all times be represented by Individual Note Certificates issued to each Noteholder in respect of their respective holdings.

### *Global Note Certificate exchangeable for Individual Note Certificates*

If the relevant Pricing Supplement specifies the form of Notes as being “Global Note Certificate exchangeable for Individual Note Certificates,” then the Notes will initially be represented by one or more Global Note Certificates, each of which will be exchangeable in whole, but not in part, for Individual Note Certificates:

- (i) on the expiry of such period of notice as may be specified in the relevant Pricing Supplement; or
- (ii) if the relevant Pricing Supplement specifies “in the limited circumstances described in the Global Note Certificate,” then:
  - (a) in the case of any Global Note Certificate held by or on behalf of DTC, if DTC notifies the relevant Issuer that it is no longer willing or able to discharge properly its responsibilities as depository with respect to any Global Note Certificate or DTC ceases to be a “clearing agency” registered under the Exchange Act or if at any time DTC is no longer eligible to act as such, and the relevant Issuer is unable to locate a qualified successor within 90 days of receiving notice or becoming aware of such ineligibility on the part of DTC;
  - (b) in the case of any Unrestricted Global Note Certificate held by or on behalf of, Euroclear and/or Clearstream and/or any other clearing system (other than DTC), if Euroclear, Clearstream or any other relevant clearing system is closed for business for a continuous period of 14 days (other than by reason of legal holidays) or announces an intention permanently to cease business; and

- (c) in any case, if any of the circumstances described in Condition 13 (*Events of Default*) occurs in respect of any Note of the relevant Tranche.

Whenever a Global Note Certificate is to be exchanged for Individual Note Certificates, each person having an interest in a Global Note Certificate must provide the Registrar (through the relevant clearing system) with such information as the relevant Issuer and the Registrar may require to complete and deliver Individual Note Certificates (including the name and address of each person in which the Notes represented by the Individual Note Certificates are to be registered and the principal amount of each such person's holding). In addition, whenever a Restricted Global Note Certificate is to be exchanged for Individual Note Certificates, each person having an interest in the Restricted Global Note Certificate must provide the Registrar (through the relevant clearing system) with a certificate given by or on behalf of the holder of each beneficial interest in the Restricted Global Note Certificate stating either (i) that such holder is not transferring its interest at the time of such exchange or (ii) that the transfer or exchange of such interest has been made in compliance with the transfer restrictions applicable to the Notes and that the person transferring such interest reasonably believes that the person acquiring such interest is both a QIB and a QP, is obtaining such beneficial interest in a transaction meeting the requirements of Rule 144A. Individual Note Certificates issued in exchange for interests in the Restricted Global Note Certificate will bear the legends and be subject to the transfer restrictions set out under "*Transfer Restrictions.*"

Whenever a Global Note Certificate is to be exchanged for Individual Note Certificates, the relevant Issuer shall procure that Individual Note Certificates will be issued in an aggregate principal amount equal to the principal amount of the Global Note Certificate within five business days of the delivery, by or on behalf of the registered holder of the Global Note Certificate to the Registrar of such information as is required to complete and deliver such Individual Note Certificates against the surrender of the Global Note Certificate at the specified office of the Registrar.

Such exchange will be effected in accordance with the provisions of the Indenture and the regulations concerning the transfer and registration of Notes and, in particular, shall be effected without charge to any holder, but against such indemnity as the Registrar may require in respect of any tax or other duty of whatsoever nature which may be levied or imposed in connection with such exchange.

#### ***Terms and Conditions applicable to the Notes***

The terms and conditions applicable to any Individual Note Certificate will be endorsed on that Individual Note Certificate and will consist of the terms and conditions set out under "*Terms and Conditions of the Notes*" below and the provisions of the relevant Pricing Supplement which supplement, amend and/or replace those terms and conditions.

The terms and conditions applicable to any Global Note Certificate will differ from those terms and conditions which would apply to the Note were it in definitive form to the extent described under "*Summary of Provisions Relating to the Notes while in Global Form*" below.

## TERMS AND CONDITIONS OF THE NOTES

*The following is the text of the terms and conditions which, as supplemented, amended and/or replaced by the relevant Pricing Supplement, will be endorsed on each Note in definitive form issued under the Program. The terms and conditions applicable to any Note in global form will differ from those terms and conditions which would apply to the Note were it in definitive form to the extent described under "Summary of Provisions Relating to the Notes while in Global Form" below.*

### 1. Introduction

- (a) **Program:** PTT Global Chemical Public Company Limited (the "**Company**") and GC Treasury Center Company Limited ("**Treasury Center**") have established a Global Medium Term Note Program (the "**Program**") for the issuance of up to U.S.\$2,000,000,000 in aggregate principal amount of notes (the "**Notes**"). Each Series (as defined below) of Notes shall be issued either by (i) the Company (in its capacity as issuer, an "**Issuer**"); or (ii) Treasury Center (in its capacity as issuer, an "**Issuer**", and together with the Company in its capacity as issuer, the "**Issuers**"); in the case of (ii), the Notes shall be unconditionally and irrevocably guaranteed by the Company (in its capacity as guarantor, the "**Guarantor**") in accordance with Condition 1(d). References to "the Issuer" in these Conditions shall be construed as to the Issuer specified in the relevant Pricing Supplement.
- (b) **Pricing Supplement:** Notes issued under the Program are issued in series (each, a "**Series**") and each Series may comprise one or more tranches (each, a "**Tranche**") of Notes. The terms and conditions applicable to any particular Series or Tranche of Notes are set out in the relevant pricing supplement (the "**Pricing Supplement**") which supplements, amends and/or replaces these terms and conditions (the "**Conditions**"). In the event of any inconsistency between these Conditions and the relevant Pricing Supplement, the relevant Pricing Supplement shall prevail.
- (c) **Indenture:** The Notes are subject to, and have the benefit of, an amended and restated indenture dated March 4, 2021 (as amended and/or supplemented from time to time, the "**Indenture**") between the Issuers, the Guarantor and Citicorp International Limited as trustee (the "**Trustee**", which expression includes all persons for the time being trustee or trustees appointed under the Indenture). Noteholders (as defined below) are deemed to have accepted the appointment of the Trustee.
- (d) **Guarantee:** The Guarantor has, in accordance with the terms of the Indenture, unconditionally and irrevocably guaranteed the due and punctual payment of all sums from time to time payable in respect of Notes issued by Treasury Center in its capacity as Issuer (the "**Guarantee**"). The Guarantor's maximum liability under the Guarantee in respect of each Series of Guaranteed Notes (as defined below) will be capped at an amount equal to 125 per cent. of the outstanding aggregate principal amount of the relevant Series of Guaranteed Notes. The Guarantee will be released in respect of a Series of Notes upon the earlier of (i) the date falling five years after the maturity date of the relevant Series of Notes or (ii) the date on which all sums expressed to be payable by Treasury Center under the Indenture and the relevant Series of Guaranteed Notes have been unconditionally and irrevocably paid and discharged in full; or, alternatively, upon a defeasance or discharge as provided in Article 13 of the Indenture, **provided that**, in each case, any rights of the Holders and any liability of the Guarantor that have arisen or accrued under the Guarantee prior to any such release will continue to be in full force and effect after any such release and will survive any such release.
- (e) **Agents:** Pursuant to a paying and transfer agent and registrar appointment letter dated March 4, 2021 (as amended and/or supplemented from time to time, the "**Paying and Transfer Agent and Registrar Appointment Letter**"), Citibank, N.A., London Branch is appointed as principal paying agent (the "**Principal Paying Agent**", which expression includes any successor principal paying agent appointed from time to time in connection with the Notes), Citibank, N.A., London Branch as exchange agent (the "**Exchange Agent**", which expression includes any successor exchange agent appointed from time to time in connection with the Notes) and Citibank, N.A., London Branch as registrar (the "**Registrar**", which expression includes any successor registrar appointed from time to time in connection with the Notes). In addition, the paying agents named therein (together with the Principal Paying Agent, the "**Paying Agents**", which expression includes any successor or additional paying agents appointed from time to time in connection with the Notes) and the transfer agents named therein (together with the Registrar, the "**Transfer Agents**", which expression includes any successor or additional transfer agents appointed from time to time in connection with the Notes) are appointed subject to these Conditions, the Indenture and the Paying and Transfer Agent and Registrar Appointment Letter. In these Conditions



references to the "**Agents**" are to the Paying Agents, the Exchange Agent and the Transfer Agents and any reference to an "**Agent**" is to any one of them.

- (f) **The Notes:** The Notes may only be issued in registered form. All subsequent references in these Conditions to "**Notes**" are to the Notes which are the subject of the relevant Pricing Supplement. Copies of the relevant Pricing Supplement are available for inspection at the Specified Office of the Paying Agents by Noteholders during normal business hours (being between 9:00 a.m. and 3:00 p.m. (London time)) on any weekday (Saturdays and public holidays excepted) following prior written notice and proof of holding and identity satisfactory to the Paying Agents.
- (g) **Summaries:** Certain provisions of these Conditions are summaries of the Indenture and are subject to their detailed provisions. Noteholders are bound by, and are deemed to have notice of, all the provisions of the Indenture applicable to them. Copies of the Indenture are available for inspection at the Specified Office of the Paying Agents by Noteholders during normal business hours (being between 9:00 a.m. and 3:00 p.m. (London time)) on any weekday (Saturdays and public holidays excepted) following prior written notice and proof of holding and identity satisfactory to the Paying Agents.

## 2. Interpretation

- (a) **Definitions:** In these Conditions the following expressions have the following meanings: "**Accrual Yield**" has the meaning given in the relevant Pricing Supplement;

"**Additional Business Centre(s)**" means the city or cities specified as such in the relevant Pricing Supplement;

"**Additional Financial Centre(s)**" means the city or cities specified as such in the relevant Pricing Supplement;

"**Applicable Premium**" means, with respect to any Note on any date fixed for redemption, as determined by the Issuer, the greater of:

- (a) 1.0 per cent. of the principal amount of the Note; or
- (b) the excess of:
  - (i) the present value at the date fixed for redemption of (i) the principal amount of the Note *plus* (ii) all required interest payments due on the Note through the Maturity Date (excluding accrued but unpaid interest to the date fixed for redemption), computed using a discount rate equal to the Treasury Rate as of such redemption date *plus* 35 basis points; over
  - (ii) the principal amount of the Note.

"**Authorized Officer**" means, with respect to any Person, a director or officer of such Person duly authorized to perform the acts required under these Conditions or the Indenture;

"**Business Day**", means any day (other than a Saturday or a Sunday) on which commercial banks and foreign exchange markets are open for business in Bangkok, London, Hong Kong and New York and, other than in Condition 3(e) (*Registration and delivery of Note Certificates*) and Condition 13 (*Events of Default*):

- (a) in relation to any sum payable in euro, a TARGET Settlement Day and a day on which commercial banks and foreign exchange markets settle payments generally in each (if any) Additional Business Centre;
- (b) in relation to any sum payable in a currency other than euro and Renminbi, a day on which commercial banks and foreign exchange markets settle payments generally, in the Principal Financial Centre of the relevant currency and in each (if any) Additional Business Centre; and

- (c) for the purposes of Notes denominated in Renminbi only, any day (other than a Sunday or a Saturday) on which commercial banks and foreign exchange markets are open for business and settle Renminbi payments in Hong Kong and are not authorized or obligated by law or executive order to be closed;

"**Business Day Convention**", in relation to any particular date, has the meaning given in the relevant Pricing Supplement and, if so specified in the relevant Pricing Supplement, may have different meanings in relation to different dates and, in this context, the following expressions shall have the following meanings:

- (a) "**Following Business Day Convention**" means that the relevant date shall be postponed to the first following day that is a Business Day;
- (b) "**Modified Following Business Day Convention**" or "**Modified Business Day Convention**" means that the relevant date shall be postponed to the first following day that is a Business Day unless that day falls in the next calendar month in which case that date will be the first preceding day that is a Business Day;
- (c) "**Preceding Business Day Convention**" means that the relevant date shall be brought forward to the first preceding day that is a Business Day;
- (d) "**FRN Convention**", "**Floating Rate Convention**" or "**Eurodollar Convention**" means that each relevant date shall be the date which numerically corresponds to the preceding such date in the calendar month which is the number of months specified in the relevant Pricing Supplement as the Specified Period after the calendar month in which the preceding such date occurred *provided, however, that:*
- (i) if there is no such numerically corresponding day in the calendar month in which any such date should occur, then such date will be the last day which is a Business Day in that calendar month;
- (ii) if any such date would otherwise fall on a day which is not a Business Day, then such date will be the first following day which is a Business Day unless that day falls in the next calendar month, in which case it will be the first preceding day which is a Business Day; and
- (iii) if the preceding such date occurred on the last day in a calendar month which was a Business Day, then all subsequent such dates will be the last day which is a Business Day in the calendar month which is the specified number of months after the calendar month in which the preceding such date occurred; and
- (e) "**No Adjustment**" means that the relevant date shall not be adjusted in accordance with any Business Day Convention;

"**Calculation Agent**" means the Principal Paying Agent or such other Person, in each case as specified in the relevant Pricing Supplement as the party responsible for calculating the Rate(s) of Interest and Interest Amount(s) and/or such other amount(s) as may be specified in the relevant Pricing Supplement;

"**Calculation Amount**" has the meaning given in the relevant Pricing Supplement;

"**Change of Control**" means (i) PTT Public Company Limited ceasing to own and control, directly or indirectly, at least 40 per cent. of the Company's issued and outstanding capital stock or (ii) any Person or Persons, acting together, becoming the owner, directly or indirectly, of a greater number of the Company's issued and outstanding capital stock than that owned and controlled, directly or indirectly, by PTT Public Company Limited or (iii) in the case of Guaranteed Notes, the Guarantor ceasing to own and control, directly or indirectly, at least 99 per cent. of Treasury Center's issued and outstanding capital stock;

"**Change of Control Triggering Event**" means the occurrence of both a Change of Control and a Ratings Decline;

"Code" means the US Internal Revenue Code of 1986;

"Consolidated Net Tangible Assets" means the total amount of the assets of the Company and its consolidated Subsidiaries, including investments in unconsolidated Subsidiaries and associated companies, after deducting therefrom (i) all current liabilities (excluding any current liabilities constituting Long-term Debt by reason of their being renewable or extendible at the option of the Company or its consolidated Subsidiaries), and (ii) all goodwill, trade names, trademarks, patents, unamortized debt discount and expense and other like intangible assets, all as set forth on the most recent statement of financial position of the Company and its consolidated Subsidiaries and computed in accordance with TFRS;

"Day Count Fraction" means, in respect of the calculation of an amount for any period of time (the "Calculation Period"), such day count fraction as may be specified in these Conditions or the relevant Pricing Supplement and:

- (a) if "Actual/Actual (ICMA)" is so specified, means:
- (i) where the Calculation Period is equal to or shorter than the Regular Period during which it falls, the actual number of days in the Calculation Period divided by the product of (1) the actual number of days in such Regular Period and (2) the number of Regular Periods in any year; and
  - (ii) where the Calculation Period is longer than one Regular Period, the sum of:
    - (A) the actual number of days in such Calculation Period falling in the Regular Period in which it begins divided by the product of (a) the actual number of days in such Regular Period and (b) the number of Regular Periods in any year; and
    - (B) the actual number of days in such Calculation Period falling in the next Regular Period divided by the product of (a) the actual number of days in such Regular Period and (b) the number of Regular Periods in any year;
- (b) if "Actual/365" or "Actual/Actual (ISDA)" is so specified, means the actual number of days in the Calculation Period divided by 365 (or, if any portion of the Calculation Period falls in a leap year, the sum of (A) the actual number of days in that portion of the Calculation Period falling in a leap year divided by 366 and (B) the actual number of days in that portion of the Calculation Period falling in a non-leap year divided by 365);
- (c) if "Actual/365 (Fixed)" is so specified, means the actual number of days in the Calculation Period divided by 365;
- (d) if "Actual/360" is so specified, means the actual number of days in the Calculation Period divided by 360;
- (e) if "30/360" is so specified, the number of days in the Calculation Period divided by 360, calculated on a formula basis as follows:

$$\text{Day Count Fraction} = \frac{[360 \times (Y_2 - Y_1)] + [30 \times (M_2 - M_1)] + (D_2 - D_1)}{360}$$

where:

"Y1" is the year, expressed as a number, in which the first day of the Calculation Period falls;

"Y2" is the year, expressed as a number, in which the day immediately following the last day included in the Calculation Period falls;

"M1" is the calendar month, expressed as a number, in which the first day of the Calculation Period falls;

"M2" is the calendar month, expressed as number, in which the day immediately following the last day included in the Calculation Period falls;

"D1" is the first calendar day, expressed as a number, of the Calculation Period, unless such number would be 31, in which case D1 will be 30; and "D2" is the calendar day, expressed as a number, immediately following the last day included in the Calculation Period, unless such number would be 31 and D1 is greater than 29, in which case D2 will be 30;

- (f) if "30E/360" or "Eurobond Basis" is so specified, the number of days in the Calculation Period divided by 360, calculated on a formula basis as follows:

$$\text{Day Count Fraction} = \frac{[360x(Y_2 - Y_1)] + [30x(M_2 - M_1)] + (D_2 - D_1)}{360}$$

where:

"Y1" is the year, expressed as a number, in which the first day of the Calculation Period falls;

"Y2" is the year, expressed as a number, in which the day immediately following the last day included in the Calculation Period falls;

"M1" is the calendar month, expressed as a number, in which the first day of the Calculation Period falls;

"M2" is the calendar month, expressed as a number, in which the day immediately following the last day included in the Calculation Period falls;

"D1" is the first calendar day, expressed as a number, of the Calculation Period, unless such number would be 31, in which case D1 will be 30; and "D2" is the calendar day, expressed as a number, immediately following the last day included in the Calculation Period, unless such number would be 31, in which case D2 will be 30; and

- (g) if "30E/360 (ISDA)" is so specified, the number of days in the Calculation Period divided by 360, calculated on a formula basis as follows:

$$\text{Day Count Fraction} = \frac{[360x(Y_2 - Y_1)] + [30x(M_2 - M_1)] + (D_2 - D_1)}{360}$$

where:

"Y1" is the year, expressed as a number, in which the first day of the Calculation Period falls;

"Y2" is the year, expressed as a number, in which the day immediately following the last day included in the Calculation Period falls;

"M1" is the calendar month, expressed as a number, in which the first day of the Calculation Period falls;

"M2" is the calendar month, expressed as a number, in which the day immediately following the last day included in the Calculation Period falls;

"D1" is the first calendar day, expressed as a number, of the Calculation Period, unless (i) that day is the last day of February or (ii) such number would be 31, in which case D1 will be 30; and

"D2" is the calendar day, expressed as a number, immediately following the last day included in the Calculation Period, unless (i) that day is the last day of February but not the Maturity Date or (ii) such number would be 31, in which case D2 will be 30,

*provided, however, that* in each such case the number of days in the Calculation Period is calculated from and including the first day of the Calculation Period to but excluding the last day of the Calculation Period;

"**Default**" means an occurrence of any event or condition which constitutes or which, after notice or passage of time or both, would become, an Event of Default;

"**Early Redemption Amount (Tax)**" means, in respect of any Note, its principal amount or such other amount as may be specified in (which shall in no event be less than its initial issue price), or determined in accordance with, the relevant Pricing Supplement;

"**Early Termination Amount**" means, in respect of any Note, its principal amount or such other amount as may be specified in, or determined in accordance with, these Conditions or the relevant Pricing Supplement;

"**Exchange Act**" means the U.S. Securities Exchange Act of 1934, as amended, and any rules or regulations promulgated thereunder;

"**Final Redemption Amount**" means, in respect of any Note, its principal amount or such other amount as may be specified in, or determined in accordance with, the relevant Pricing Supplement;

"**First Interest Payment Date**" means the date specified in the relevant Pricing Supplement;

"**Fixed Coupon Amount**" has the meaning given in the relevant Pricing Supplement;

"**Group**" means the Company and its Subsidiaries, taken as a whole;

"**Guaranteed Notes**" means Notes issued by Treasury Center as Issuer and guaranteed by the Guarantor;

"**Holder**" has the meaning given in Condition 3(b) (*Title*);

"**Hong Kong**" means the Hong Kong Special Administrative Region of the PRC;

"**Indebtedness**" means any obligation for the payment or repayment of money borrowed;

"**Interest Amount**" means, in relation to a Note and an Interest Period, the amount of interest payable in respect of that Note for that Interest Period;

"**Interest Commencement Date**" means the Issue Date of the Notes or such other date as may be specified as the Interest Commencement Date in the relevant Pricing Supplement;

"**Interest Determination Date**" has the meaning given in the relevant Pricing Supplement;

"**Interest Payment Date**" means the First Interest Payment Date and any date or dates specified as such in, or determined in accordance with the provisions of, the relevant Pricing Supplement and, if a Business Day Convention is specified in the relevant Pricing Supplement:

- (a) as the same may be adjusted in accordance with the relevant Business Day Convention; or
- (b) if the Business Day Convention is the FRN Convention, Floating Rate Convention or Eurodollar Convention and an interval of a number of calendar months is specified in the relevant Pricing Supplement as being the Specified Period, each of such dates as may occur in accordance with the FRN Convention, Floating Rate Convention or Eurodollar Convention at such Specified Period of calendar months following the Interest Commencement Date (in the case of the first Interest Payment Date) or the previous Interest Payment Date (in any other case);

**"Interest Period"** means each period beginning on (and including) the Interest Commencement Date or any Interest Payment Date and ending on (but excluding) the next Interest Payment Date;

**"ISDA Definitions"** means the 2006 ISDA Definitions (as amended and updated as at the date of issue of the first Tranche of the Notes of the relevant Series (as specified in the relevant Pricing Supplement) as published by the International Swaps and Derivatives Association, Inc.) unless otherwise specified in the relevant Pricing Supplement;

**"Issue Date"** has the meaning given in the relevant Pricing Supplement;

**"Limited Recourse Debt"** means, with respect to any Limited Recourse Subsidiary, Relevant Indebtedness of such Limited Recourse Subsidiary with respect to which the recourse of the holder or obligee of such Relevant Indebtedness is limited to (i) assets associated with the assets or project or concession (which in any event shall not include assets held by any other Subsidiary other than another Limited Recourse Subsidiary, if any, whose sole business is the ownership, acquisition management, development, operation, construction, improvement, installation, design, engineering, completion, maintenance, and/or financing of such asset, project or concession and substantially all of whose assets are associated with such assets or project or concession) in respect of which such Relevant Indebtedness was incurred and/or (ii) such Limited Recourse Subsidiary and/or the equity interests in such Limited Recourse Subsidiary, but in the case of clause (ii) only if such Limited Recourse Subsidiary's primary business is the ownership, acquisition management, development, operation, construction, improvement, installation, design, engineering, completion, maintenance, and/or financing of such asset, project or concession and substantially all of such Limited Recourse Subsidiary's assets are associated with such assets or project or concession. For purposes of these Conditions, Relevant Indebtedness of a Limited Recourse Subsidiary shall not fail to be Limited Recourse Debt solely by virtue of the fact that the holders of such Limited Recourse Debt have recourse to Company or another Subsidiary of Company pursuant to a contingent obligation supporting such Limited Recourse Debt (such as a completion guarantee or guarantee of an equity contribution obligation);

**"Limited Recourse Subsidiary"** means any present or future Subsidiary of the Company or any other entity in which the Company owns more than 10%:

- (a) the primary business of which is, or will be, the ownership, acquisition management, development, operation, construction, improvement, installation, design, engineering, completion, maintenance, and/or financing of an asset, project or concession (whether or not an asset, project or concession of the Company or any of its Subsidiaries), and/or to hold directly or indirectly the shares of one or more other Limited Recourse Subsidiaries; and
- (b) the outstanding Relevant Indebtedness of which consists of Limited Recourse Indebtedness;

**"Long-term Debt"** means any note, bond, debenture or other Indebtedness having a maturity of more than one year from the date such Indebtedness was incurred or having a maturity of less than one year but by its terms being renewable or extendible, at the option of the Company or the borrower, beyond one year from the date such evidence of Indebtedness was incurred;

**"Margin"** has the meaning given in the relevant Pricing Supplement;

**"Maturity Date"** has the meaning given in the relevant Pricing Supplement;

**"Maximum Redemption Amount"** has the meaning given in the relevant Pricing Supplement;

**"Minimum Redemption Amount"** has the meaning given in the relevant Pricing Supplement;

**"Moody's"** means Moody's Investors Service, Inc. and its successors;

**"Noteholder"** has the meaning given in Condition 3(b) (*Title*);

**"Officer's Certificate"** means a certificate signed by an Authorized Officer of the Issuer or the Guarantor (as applicable) and delivered to the Trustee;

**"Opinion of Counsel"** means an opinion in writing signed by legal counsel who may be an employee of, or counsel to, the Issuer or the Guarantor (as applicable) or who may be other counsel satisfactory to the Trustee;

**"Optional Redemption Amount (Call)"** means, in respect of any Note, its principal amount *plus* the Applicable Premium;

**"Optional Redemption Amount (Put)"** means, in respect of any Note, its principal amount or such other amount as may be specified in, or determined in accordance with, the relevant Pricing Supplement;

**"Optional Redemption Date (Call)"** has the meaning given in the relevant Pricing Supplement;

**"Optional Redemption Date (Put)"** has the meaning given in the relevant Pricing Supplement;

**"Payment Business Day"** means:

- (a) if the currency of payment is euro, any day which is:
  - (i) a day on which (a) banks in the relevant place of presentation are open for presentation and payment of debt securities and for dealings in foreign currencies; and (b) a day on which commercial banks are open for general business (including dealings in foreign currencies) in the city where the Principal Paying Agent or, as the case may be, the Paying Agent has its Specified Office; and
  - (ii) in the case of payment by transfer to an account, (a) a TARGET Settlement Day and (b) a day on which dealings in foreign currencies may be carried on in each (if any) Additional Financial Centre; or
- (b) if the currency of payment is not euro, any day which is:
  - (i) a day on which (a) banks in the relevant place of presentation are open for presentation and payment of debt securities and for dealings in foreign currencies and (b) a day on which commercial banks are open for general business (including dealings in foreign currencies) in the city where the Principal Paying Agent or, as the case may be, the Paying Agent has its Specified Office; and
  - (ii) in the case of payment by transfer to an account, a day on which dealings in foreign currencies (including, in the case of Notes denominated in Renminbi, settlement of Renminbi payments) may be carried on in the Principal Financial Centre of the currency of payment and in each (if any) Additional Financial Centre;

**"Person"** means any individual, corporation, partnership, joint venture, association, joint-stock company, trust, unincorporated organization, limited liability company, state-owned enterprise, government or any agency or political subdivision thereof or any other entity;

**"PRC"** means, for the purpose of these Conditions, the People's Republic of China excluding Hong Kong, Macau and Taiwan;

**"Principal Financial Centre"** means, in relation to any currency, the principal financial centre for that currency *provided, however, that:*

- (a) in relation to euro, it means the principal financial centre of such Member State of the European Communities as is selected (in the case of a payment) by the payee or (in the case of a calculation) by the Calculation Agent;
- (b) in relation to Australian dollars, it means Sydney and in relation to New Zealand dollars, it means Auckland, in each case as is selected (in the case of a payment) by the payee or (in the case of a calculation) by the Calculation Agent or, in each case, the principal financial centre as is specified in the applicable Pricing Supplement; and

- (c) in relation to Renminbi, it means Hong Kong or the principal financial centre as is specified in the applicable Pricing Supplement;

**"Rate of Interest"** means the rate or rates (expressed as a percentage per annum) of interest payable in respect of the Notes specified in the relevant Pricing Supplement or calculated or determined in accordance with the provisions of these Conditions and/or the relevant Pricing Supplement;

**"Rating Agency"** means any of (i) S&P and (ii) Moody's **provided that** (A) if either of S&P or Moody's, but not both, will not make a rating of the Notes publicly available, one other "nationally recognized statistical rating organization" that is registered as such pursuant to Section 15E of the Exchange Act and Rule 17g thereunder selected by the Issuer as a replacement agency will be substituted for S&P or Moody's, as the case may be; and (B) if both S&P and Moody's will not make a rating of the Notes publicly available, two other "nationally recognized statistical rating organizations" that are registered as such pursuant to Section 15E of the Exchange Act and Rule 17g thereunder selected by the Issuer as replacement agencies;

**"Rating Category"** means (1) with respect to S&P, any of the following categories: "AAA," "AA," "A," "BBB," "BB," "B," "CCC," "CC," "C" and "D" (or equivalent successor categories); (2) with respect to Moody's, any of the following categories: "Aaa," "Aa," "A," "Baa," "Ba," "B," "Caa," "Ca," and "C" (or equivalent successor categories); and (3) the equivalent of any such category of S&P or Moody's used by another Rating Agency. In determining whether the rating of the Notes has decreased by one or more gradations, gradations within Rating Categories ("+" and "-" for S&P; "1," "2" and "3" for Moody's; or the equivalent gradations for another Rating Agency) shall be taken into account (e.g., with respect to S&P, a decline in a rating from "BB+" to "BB," as well as from "B+" to "B-," will constitute a decrease of one gradation);

**"Ratings Decline"** means, in connection with a Change of Control Triggering Event, the occurrence on, or within 90 days after, the earlier of the date, or public notice of the occurrence, of a Change of Control or the intention by PTT Public Company Limited to effect a Change of Control (which period will be extended so long as the rating of the Notes is under publicly announced consideration for possible downgrade by any of the Rating Agencies), the public announcement by either Rating Agency of a decrease in the rating of the Notes by one or more gradations (including gradations within Rating Categories as well as between Rating Categories);

**"Redemption Amount"** means, as appropriate, the Final Redemption Amount, the Early Redemption Amount (Tax), the Optional Redemption Amount (Call), the Optional Redemption Amount (Put), the Early Termination Amount or such other amount in the nature of a redemption amount as may be specified in, or determined in accordance with the provisions of, the relevant Pricing Supplement;

**"Reference Banks"** has the meaning given in the relevant Pricing Supplement or, if none, four major banks selected by the Issuer in the market that is most closely connected with the Reference Rate and notified in writing to the Trustee and the Calculation Agent;

**"Reference Price"** has the meaning given in the relevant Pricing Supplement;

**"Reference Rate"** has the meaning given in the relevant Pricing Supplement;

**"Regular Period"** means:

- (a) in the case of Notes where interest is scheduled to be paid only by means of regular payments, each period from and including the Interest Commencement Date to but excluding the first Interest Payment Date and each successive period from and including one Interest Payment Date to but excluding the next Interest Payment Date;
- (b) in the case of Notes where, apart from the first Interest Period, interest is scheduled to be paid only by means of regular payments, each period from and including a Regular Date falling in any year to but excluding the next Regular Date, where **"Regular Date"** means the day and month (but not the year) on which any Interest Payment Date falls; and



- (c) in the case of Notes where, apart from one Interest Period other than the first Interest Period, interest is scheduled to be paid only by means of regular payments, each period from and including a Regular Date falling in any year to but excluding the next Regular Date, where "**Regular Date**" means the day and month (but not the year) on which any Interest Payment Date falls other than the Interest Payment Date falling at the end of the irregular Interest Period.

"**Relevant Date**" means, in relation to any payment, whichever is the later of (a) the date on which the payment in question first becomes due and (b) if the full amount payable has not been received in the Principal Financial Centre of the currency of payment by the Principal Paying Agent or the Trustee on or prior to such due date, the date on which (the full amount having been so received) notice to that effect has been given to the Noteholders;

"**Relevant Financial Centre**" has the meaning given in the relevant Pricing Supplement;

"**Relevant Indebtedness**" of any Person means, at any date, Indebtedness (i) that has a final maturity date of one year or more from the date of incurrence or issuance of such Indebtedness and (ii) is in the form of, is represented or embodied by, bonds, notes, debentures or other securities which are, or are intended to be, commonly quoted, listed or dealt in or traded on any stock exchange or over-the-counter securities market;

"**Relevant Screen Page**" means the page, section or other part of a particular information service (including, without limitation, Reuters) specified as the Relevant Screen Page in the relevant Pricing Supplement, or such other page, section or other part as may replace it on that information service or such other information service, in each case, as may be nominated by the Person providing or sponsoring the information appearing there for the purpose of displaying rates or prices comparable to the Reference Rate;

"**Relevant Time**" has the meaning given in the relevant Pricing Supplement;

"**Reset Interest Rate**" has the meaning given in Condition 6(e);

"**Security Interest**" means any mortgage, pledge, lien, fixed or floating charge or other encumbrance;

"**SGX-ST**" means the Singapore Exchange Securities Trading Limited;

"**Specified Currency**" has the meaning given in the relevant Pricing Supplement;

"**Specified Denomination(s)**" has the meaning given in the relevant Pricing Supplement;

"**Specified Office**" has the meaning given in the Indenture;

"**Specified Period**" has the meaning given in the relevant Pricing Supplement;

"**Subsidiary**" means any corporation or other entity of which more than 50 per cent. of the total voting power of shares, securities or other ownership interests entitled to vote in the election of the board of directors or other persons performing similar functions is at the time directly or indirectly owned by the Company;

"**S&P**" means S&P Global Inc. and its successors;

"**TARGET Settlement Day**" means any day on which TARGET2 is open for the settlement of payments in euro;

"**TARGET2**" means the Trans-European Automated Real-Time Gross Settlement Express Transfer payment system which utilizes a single shared platform and which was launched on 19 November 2007;

"**Treasury Rate**" means, as of any redemption date, the yield to maturity as of such redemption date of United States Treasury securities with a constant maturity (as compiled and published in the most recent Federal Reserve Statistical Release H.15 (519) that has become publicly available at least two business days prior to the redemption date (or, if such Statistical Release is no longer published, any publicly

available source of similar market data)) most nearly equal to the period from the redemption date to the Maturity Date; *provided, however, that* if the period from the redemption date to the Maturity Date, is less than one year, the weekly average yield on actually traded United States Treasury securities adjusted to a constant maturity of one year will be used;

"**TRFS**" means Thai Financial Reporting Standards; and

"**Zero Coupon Note**" means a Note specified as such in the relevant Pricing Supplement.

(b) ***Interpretation:***

In these Conditions:

- (i) any reference to principal shall be deemed to include the Redemption Amount, any Additional Amounts (as defined in Condition 12 (*Additional Amounts*)), any premium payable in respect of a Note and any other amount in the nature of principal payable pursuant to these Conditions or the Indenture;
- (ii) any reference to interest shall be deemed to include any Additional Amounts and any other amount in the nature of interest payable pursuant to these Conditions or the Indenture;
- (iii) references to Notes being "**outstanding**" shall be construed in accordance with the Indenture;
- (iv) if an expression is stated in Condition 2(a) (*Interpretation — Definitions*) to have the meaning given in the relevant Pricing Supplement, but the relevant Pricing Supplement gives no such meaning or specifies that such expression is "**not applicable**" then such expression is not applicable to the Notes; and
- (v) any reference to the Indenture shall be construed as a reference to the Indenture as amended and/or supplemented up to and including the Issue Date of the Notes.

3. **Form, Denomination, Title and Transfer**

(a) ***Notes***

Notes are in the Specified Denomination(s), which may include a minimum denomination specified in the relevant Pricing Supplement and higher integral multiples of a smaller amount specified in the relevant Pricing Supplement.

(b) ***Title***

The Registrar will maintain a register outside the United Kingdom in accordance with the provisions of the Indenture. A certificate (each, a "**Note Certificate**") will be issued to each Holder of Notes in respect of its registered holding. Each Note Certificate will be numbered serially with an identifying number which will be recorded in the register (the "**Register**"). "**Holder**" means the person in whose name such Note is for the time being registered in the Register (or, in the case of a joint holding, the first named thereof) and "**Noteholder**" shall be construed accordingly.

(c) ***Ownership***

The Holder of any Note shall (except as otherwise required by law) be treated as its absolute owner for all purposes (whether or not it is overdue and regardless of any notice of ownership, trust or any other interest therein, any writing on the Note Certificate relating thereto (other than the endorsed form of transfer) or any notice of any previous loss or theft thereof) and no Person shall be liable for so treating such Holder.

(d) ***Transfers of Notes***

Subject to paragraphs (g) and (h) below, a Note may be transferred upon surrender of the relevant Note Certificate, with the endorsed form of transfer duly completed, at the Specified Office of the Registrar

or any Transfer Agent, together with such evidence as such Registrar or (as the case may be) such Transfer Agent may reasonably require to prove the title of the transferor and the authority of the individuals who have executed the form of transfer; provided, however, that a Note may not be transferred unless the principal amount of Notes transferred and (where not all of the Notes held by a Holder are being transferred) the principal amount of the balance of Notes not transferred are Specified Denominations. Where not all the Notes represented by the surrendered Note Certificate are the subject of the transfer, a new Note Certificate in respect of the balance of the Notes will be issued to the transferor.

(e) ***Registration and delivery of Note Certificates***

Within five business days of the surrender of a Note Certificate in accordance with paragraph (d) above, the Registrar will register the transfer in question and deliver a new Note Certificate of a like principal amount to the Notes transferred to each relevant Holder at its Specified Office or (as the case may be) the Specified Office of any Transfer Agent or (at the request and risk of any such relevant Holder) to the address specified for the purpose by such relevant Holder. In this paragraph, "business day" means a day on which commercial banks are open for general business (including dealings in foreign currencies) in the city where the Registrar or (as the case may be) the relevant Transfer Agent has its Specified Office.

(f) ***No charge***

The transfer of a Note will be effected without charge by or on behalf of the Issuer, the Guarantor (if applicable) or the Registrar or any Transfer Agent but against such indemnity by the transferor as such Registrar or (as the case may be) such Transfer Agent may require in respect of any tax or other duty of whatsoever nature which may be levied or imposed in connection with such transfer.

(g) ***Closed periods***

Noteholders may not require transfers to be registered:

- (i) during the period of 15 days ending on the due date for any payment of principal or interest in respect of the Notes; and
- (ii) during the period of 15 days ending on any date on which Notes may be called for redemption by the Issuer at its option pursuant to Condition 10(b) (*Optional Tax Redemption*) or Condition 10(c) (*Optional Redemption*) below.

(h) ***Regulations concerning transfers and registration***

All transfers of Notes and entries on the Register are subject to the detailed regulations concerning the transfer of Notes scheduled to the program manual relating to the Program. The regulations may be changed by the Issuer with the prior written approval of the Registrar. A copy of the current regulations will be sent by the Registrar to any Noteholder (at the cost and expense of such Noteholder) who requests in writing a copy of such regulations.

4. **Status**

- (a) The Notes constitute direct, unconditional, unsubordinated and (subject to Condition 5(a) (*Limitation on Liens*)) unsecured obligations of the Issuer which will at all times rank *pari passu* among themselves and at least *pari passu* with all other present and future unsecured and unsubordinated obligations of the Issuer, save for such obligations as may be preferred by provisions of law that are both mandatory and of general application.
- (b) The Guarantor's obligations under the Guarantee constitute direct, unconditional, unsubordinated and (subject to Condition 5(a) (*Limitation on Liens*)) unsecured obligations of the Guarantor which will at all times rank *pari passu* among themselves and at least *pari passu* with all other present and future unsecured and unsubordinated obligations of the Guarantor, save for such obligations as may be preferred by provisions of law that are both mandatory and of general application.

5. **Certain Covenants**

(a) ***Limitation on Liens***

So long as any Note remains outstanding, the Company will not, and the Company will not permit any of its Subsidiaries to, create, incur, issue or assume or guarantee any Relevant Indebtedness secured by any Security Interest on any property or assets owned by it or any Subsidiary without in any such case effectively providing that the Notes (together with, if the Company shall so determine, any other Indebtedness of the Company or the Company's Subsidiaries then existing or thereafter created which is not subordinated to the Notes) will be secured at least equally and ratably with or prior to such secured Relevant Indebtedness unless, after giving effect thereto, the aggregate principal amount of all such secured Relevant Indebtedness would not exceed 10 per cent. of the Company's Consolidated Net Tangible Assets.

The foregoing restrictions will not apply to Relevant Indebtedness secured by:

- (i) any Security Interest existing on the Issue Date of the Notes;
- (ii) any Security Interest existing on any property or assets prior to the acquisition thereof by the Company or any of its Subsidiaries or arising after such acquisition pursuant to contractual commitments entered into prior to, and not in contemplation of, such acquisition;
- (iii) any Security Interest securing Relevant Indebtedness incurred or assumed for the purpose of financing the purchase price of any property or assets or the cost of construction, improvement or repair of all or any part thereof, **provided that** such Security Interest attaches to such property or assets concurrently with or within 12 months after the acquisition thereof or the completion of construction, improvement or repair thereof;
- (iv) any Security Interest existing on any property or assets of any Subsidiary prior to the time such Subsidiary becomes a Subsidiary of the Company or arising after such time pursuant to contractual commitments entered into prior to, and not in contemplation of, such Subsidiary becoming a Subsidiary of the Company;
- (v) any Security Interest securing Limited Recourse Debt; or
- (vi) any Security Interest arising out of the refinancing, extension, renewal or refunding of any Relevant Indebtedness secured by any Security Interest permitted by any of the foregoing clauses, to the extent of the amount of such Relevant Indebtedness; **provided that** such Relevant Indebtedness is not secured by any additional property or assets.

(b) ***Consolidation, Merger and Sale of Assets***

Neither the Issuer nor (while there are any Guaranteed Notes outstanding) the Guarantor (if applicable) will consolidate with or merge with or into any other Person in a transaction in which the Issuer or the Guarantor (if applicable) is not the surviving entity, or sell, transfer or lease or otherwise dispose of all or substantially all of its property or assets (computed on a consolidated basis) to any Person, unless:

- (i) any Person formed by such consolidation or into which the Issuer or the Guarantor (if applicable) is merged or to whom the Issuer or the Guarantor (if applicable) has sold, transferred, leased or otherwise disposed of substantially all of its properties or assets (a "**Successor Issuer**" or a "**Successor Guarantor**", as applicable) is a corporation organized and validly existing under the laws of the Kingdom of Thailand, and expressly assumes by a supplemental agreement all obligations of the Issuer or the Guarantor (if applicable) under the Notes, the Indenture and the Paying and Transfer Agent and Registrar Appointment Letter;
- (ii) immediately after giving effect to such transaction, no Default or Event of Default shall have occurred and be continuing;
- (iii) if, as a result of the transaction, any property or asset of the Company or any of the Company's Subsidiaries would become subject to a Security Interest that would not be permitted under

Condition 5(a) above, the Company or such successor Person takes such steps as shall be necessary to secure the Notes at least equally and ratably with the Relevant Indebtedness secured by such Security Interest or by such other Security Interest as shall have been approved by Holders of the Notes pursuant to the Indenture; and

- (iv) the Issuer or the Guarantor (if applicable) delivers to the Trustee an Officer's Certificate and an Opinion of Counsel, in each case stating that such consolidation, merger or transfer and the relevant supplemental agreement complies with this provision and that all conditions precedent provided for in the Indenture and the Paying and Transfer Agent and Registrar Appointment Letter relating to such transaction have been complied with and that the relevant supplemental agreement is enforceable.

References to the Issuer and the Guarantor in these Conditions shall be deemed to include any Successor Issuer or Successor Guarantor.

(c) ***Reports and Notices of Default***

So long as any of the Notes remain outstanding, the Issuer shall file with the Trustee and, upon request, furnish to the Holders of the Notes, as soon as they are available but in any event not more than 10 calendar days after any financial statements of the Company are filed with the Stock Exchange of Thailand (the "SET") or any other recognized exchange on which the Company's common shares are at any time listed for trading, true and correct copies of any financial statements filed with such exchange if such financial statements are in the English language;

**provided that**, if such financial statements are not in the English language, or at any time the common stock of the Company ceases to be listed for trading on SET or any other recognized exchange, the Issuer shall file with the Trustee and, upon request, furnish to the Holders of the Notes:

- (i) as soon as they are available, but in any event within 90 calendar days after the end of each fiscal year of the Company, copies of the Company's financial statements (on a consolidated basis) in respect of such fiscal year (including a statement of income, balance sheet and cash flow statement) audited by a member firm of independent accountants;
- (ii) as soon as they are available, but in any event within 45 calendar days after the end of the first three fiscal quarters of the Company, copies of the Company's unaudited financial statements (on a consolidated basis) in respect of such fiscal quarter (including a statement of income, balance sheet and cash flow statement) prepared on a basis consistent with the audited financial statements of the Company, together with a certificate signed by the person then authorized to sign financial statements on behalf of the Company, to the effect that such financial statements are true in all material respects and present fairly the financial position of the Company, as at the end of, and the results of its operations for, the relevant fiscal quarter; and

**provided further that**, if reports other than financial statements filed with the SET or any other recognized exchange on which the Company's common shares are at any time listed for trading are not in the English language, the Issuer shall file with the Trustee and, upon request, furnish to the Holders of the Notes, as soon as practicable after the issue or publication of such reports, English copies of such reports.

The Trustee shall have no obligation whatsoever to determine whether or not such information, documents or reports have been filed with the exchange.

So long as any of the Notes remain outstanding, the Issuer and the Guarantor (if applicable) shall provide to the Trustee promptly after the Issuer or the Guarantor (if applicable) becomes aware of the occurrence of a Default, an Officer's Certificate setting forth the details of the Default, the nature and status thereof, and the action which the Issuer or the Guarantor (if applicable) proposes to take with respect thereto.

6. **Fixed Rate Note Provisions**

(a) ***Application***

This Condition 6 is applicable to the Notes only if the Fixed Rate Note Provisions are specified in the relevant Pricing Supplement as being applicable.

(b) ***Accrual of interest***

The Notes bear interest from the Interest Commencement Date at the Rate of Interest payable in arrear on each Interest Payment Date up to and including the Maturity Date, subject as provided in Condition 11 (*Payments*) below. Each Note will cease to bear interest from the due date for final redemption unless, upon due presentation, payment of the Redemption Amount is improperly withheld or refused, in which case it will continue to bear interest in accordance with this Condition 6 (as well after as before judgment) until whichever is the earlier of (i) the day on which all sums due in respect of such Note up to that day are received by or on behalf of the relevant Noteholder and (ii) the day which is seven days after the Principal Paying Agent or the Trustee has notified the Noteholders of receipt of all sums due in respect of the Notes up to such seventh day (except to the extent that there is any subsequent default in payment).

(c) ***Fixed Coupon Amount***

Unless specified in the relevant Pricing Supplement, the amount of interest payable in respect of each Note for any Interest Period shall be the relevant Fixed Coupon Amount and, if the Notes are in more than one Specified Denomination, shall be the relevant Fixed Coupon Amount in respect of the relevant Specified Denomination.

(d) ***Calculation of interest amount***

The amount of interest payable in respect of each Note for any period for which a Fixed Coupon Amount is not specified shall be calculated by applying the Rate of Interest to the Calculation Amount, multiplying the product by the relevant Day Count Fraction, rounding the resulting figure to the nearest sub-unit of the Specified Currency (half a sub-unit being rounded upwards) and multiplying such rounded figure by a fraction equal to the Specified Denomination of such Note divided by the Calculation Amount. For this purpose a "**sub-unit**" means, in the case of any currency other than euro, the lowest amount of such currency that is available as legal tender in the country of such currency and, in the case of euro, means one cent.

(e) ***Step-up upon a Change of Control Triggering Event***

The Rate of Interest payable on the Notes will be subject to an increase of 1.25 per cent. upon the occurrence of a Change of Control Triggering Event (the Rate of Interest subject to such increase, the "**Reset Interest Rate**"). The Reset Interest Rate will have effect from and including the first interest payment date following the date of the occurrence of such Change of Control Triggering Event and shall apply to all subsequent interest payment dates regardless of any future increase in the ratings of the Notes.

7. **Floating Rate Note and Index-Linked Interest Note Provisions**

(a) ***Application***

This Condition 7 is applicable to the Notes only if the Floating Rate Note Provisions or the Index-Linked Interest Note Provisions are specified in the relevant Pricing Supplement as being applicable.

(b) ***Accrual of interest***

The Notes bear interest from the Interest Commencement Date at the Rate of Interest payable in arrear on each Interest Payment Date, subject as provided in Condition 11 (*Payments*) below. Each Note will cease to bear interest from the due date for final redemption unless, upon due presentation, payment of the Redemption Amount is improperly withheld or refused, in which case it will continue to bear interest in accordance with this Condition (as well after as before judgment) until whichever is the earlier of (i) the day on which all sums due in respect of such Note up to that day are received by or on behalf of the

relevant Noteholder and (ii) the day which is seven days after the Principal Paying Agent or the Trustee has notified the Noteholders of receipt of all sums due in respect of the Notes up to such seventh day (except to the extent that there is any subsequent default in payment).

(c) **Screen Rate Determination**

If Screen Rate Determination is specified in the relevant Pricing Supplement as the manner in which the Rate(s) of Interest is/are to be determined, the Rate of Interest applicable to the Notes for each Interest Period will be determined by the Calculation Agent on the following basis:

- (i) if the Reference Rate is a composite quotation or customarily supplied by one entity, the Calculation Agent will determine the Reference Rate which appears on the Relevant Screen Page as of the Relevant Time on the relevant Interest Determination Date;
- (ii) if Linear Interpolation is specified as applicable in respect of an Interest Period in the applicable Pricing Supplement, the Rate of Interest for such Interest Period shall be calculated by the Calculation Agent by straight-line linear interpolation by reference to two rates which appear on the Relevant Screen Page as of the Relevant Time on the relevant Interest Determination Date, where:
  - (A) one rate shall be determined as if the Relevant Period were the period of time for which rates are available next shorter than the length of the relevant Interest Period; and
  - (B) the other rate shall be determined as if the Relevant Period were the period of time for which rates are available next longer than the length of the relevant Interest Period;

*provided, however*, that if no rate is available for a period of time next shorter or, as the case may be, next longer than the length of the relevant Interest Period, then the Calculation Agent shall, upon seeking advice from the Reference Banks (at the cost of the Issuer (failing which, the Guarantor (if applicable))) or taking instructions from the Issuer, determine such rate at such time and by reference to such sources as it determines appropriate;

- (iii) in any other case, the Calculation Agent will determine the arithmetic mean of the Reference Rates which appear on the Relevant Screen Page as of the Relevant Time on the relevant Interest Determination Date;
- (iv) if, in the case of (i) above, such rate does not appear on that page or, in the case of (ii) above, fewer than two such rates appear on that page or if, in either case, the Relevant Screen Page is unavailable, the Issuer (or an agent appointed by it) will:
  - (A) request the principal Relevant Financial Centre office of each of the Reference Banks to provide a quotation of the Reference Rate at approximately the Relevant Time on the Interest Determination Date to prime banks in the Relevant Financial Centre interbank market in an amount that is representative for a single transaction in that market at that time; and
  - (B) the Issuer (or an agent appointed by it) shall notify the Calculation Agent of the same. The Calculation Agent will determine the arithmetic mean of such quotations;
- (v) if fewer than two such quotations are provided as requested in accordance with (iv) above, the Calculation Agent will determine the arithmetic mean of the rates (being the nearest to the Reference Rate, as determined by the Calculation Agent) quoted by major banks in the Principal Financial Centre of the Specified Currency, selected by the Issuer, at approximately 11.00 a.m. (local time in the Principal Financial Centre of the Specified Currency) on the first day of the relevant Interest Period for loans in the Specified Currency for a period equal to the relevant Interest Period and in an amount that is representative for a single transaction in that market at that time, and the Rate of Interest for such Interest Period shall be the sum of the Margin and the rate or (as the case may be) the arithmetic mean so determined; provided, however, that if the Calculation Agent is unable to determine a rate or (as the case may be) an arithmetic mean in accordance with the above provisions in relation to any Interest Period, the Rate of Interest

applicable to the Notes during such Interest Period will be the sum of the Margin and the rate or (as the case may be) the arithmetic mean last determined in relation to the Notes in respect of a preceding Interest Period.

(vi) notwithstanding the foregoing, if the Reference Rate from time to time in respect of Floating Rate Notes is specified hereon as CNH HIBOR:

(A) the Rate of Interest for each Interest Period will, subject as provided below, be either:

(1) the offered quotation; or

(2) the arithmetic mean of the offered quotations,

(expressed as a percentage rate per annum) for the Reference Rate which appears on the Relevant Screen Page as at 11.15 a.m. (Hong Kong time) or if, at or around that time it is notified that the fixing will be published at 2.30 p.m. (Hong Kong time), then 2.30 p.m. (Hong Kong time) on the Interest Determination Date in question as determined by the Calculation Agent;

(B) if the Relevant Screen Page is not available or, if sub-paragraph (vi)(A)(1) above applies and no such offered quotation appears on the Relevant Screen Page, or, if subparagraph (vi)(A)(2) above applies and fewer than three such offered quotations appear on the Relevant Screen Page, in each case as at the time specified above, subject as provided below, the Issuer (or an agent appointed by it) shall request the principal Hong Kong office of each of the Reference Banks to provide the Calculation Agent with its offered quotation (expressed as a percentage rate per annum) for the Reference Rate at approximately 11.15 a.m. (Hong Kong time) on the Interest Determination Date in question. If two or more of the Reference Banks provide the Calculation Agent with such offered quotations, the Rate of Interest for such Interest Period shall be the arithmetic mean of such offered quotations as determined by the Calculation Agent. If all four Reference Banks provide the Calculation Agent with such offered quotations, the highest (or, if there is more than one such highest quotation, one only of such quotations) and the lowest (or, if there is more than one such lowest quotation, one only of such quotations) shall be disregarded by the Calculation Agent for the purpose of determining the arithmetic mean of such offered quotations;

(C) if subparagraph (vi)(B) above applies and the Calculation Agent determines that fewer than two Reference Banks are providing offered quotations, subject as provided below, the Rate of Interest shall be the arithmetic mean of the rates per annum (expressed as a percentage) on the request of the Issuer (or an agent appointed by it) and as communicated to the Calculation Agent by the Reference Banks or any two or more of them, at which such banks were offered at approximately 11.15 a.m. (Hong Kong time) on the relevant Interest Determination Date, deposits in CNH for a period equal to that which would have been used for the Reference Rate by leading banks in the Hong Kong inter-bank market. If fewer than two of the Reference Banks provide the Calculation Agent with such offered rates, the Rate of Interest shall be (i) the offered rate for deposits in CNH for a period equal to that which would have been used for the Reference Rate by a bank, or (ii) the arithmetic mean of the offered rates for deposits in CNH for a period equal to that which would have been used for the Reference Rate by two or more banks, in each case as informed to the Calculation Agent by such bank or banks (which shall be such bank or banks being in the opinion of the Issuer suitable for such purpose) as being quoted by each such bank at approximately 11.15 a.m. (Hong Kong time) on the relevant Interest Determination Date to leading banks in the Hong Kong inter-bank market, **provided that**, if the Rate of Interest cannot be determined in accordance with the foregoing provisions of this paragraph, the Rate of Interest shall be determined as at the last preceding Interest Determination Date (though substituting, where a different Margin or Maximum or Minimum Rate of Interest is to be applied to the relevant Interest Period from that which applied to the last preceding Interest Period, the Margin or Maximum or Minimum Rate of Interest relating to the relevant Interest Period, in place of the Margin or Maximum or Minimum Rate of Interest relating to that last preceding Interest Period); and



(D) in no event shall the Rate of Interest be less than zero per cent. per annum.

(d) ***ISDA Determination***

If ISDA Determination is specified in the relevant Pricing Supplement as the manner in which the Rate(s) of Interest is/are to be determined, the Rate of Interest applicable to the Notes for each Interest Period will be the sum of the Margin and the relevant ISDA Rate where "**ISDA Rate**" in relation to any Interest Period means a rate equal to the Floating Rate (as defined in the ISDA Definitions) that would be determined by the Calculation Agent under an interest rate swap transaction if the Calculation Agent were acting as Calculation Agent for that interest rate swap transaction under the terms of an agreement incorporating the ISDA Definitions and under which:

- (i) the Floating Rate Option (as defined in the ISDA Definitions) is as specified in the relevant Pricing Supplement;
- (ii) the Designated Maturity (as defined in the ISDA Definitions) is a period specified in the relevant Pricing Supplement;
- (iii) the relevant Reset Date (as defined in the ISDA Definitions) is either (A) if the relevant Floating Rate Option is based on (x) the London inter-bank offered rate (LIBOR), (y) the Eurozone inter-bank offered rate (EURIBOR) or (z) the Hong Kong inter-bank offered rate (HIBOR) for a currency, the first day of that Interest Period or (B) in any other case, as specified in the relevant Pricing Supplement; and
- (iv) if Linear Interpolation is specified as applicable in respect of an Interest Period in the applicable Pricing Supplement, the Rate of Interest for such Interest Period shall be calculated by the Calculation Agent by straight-line linear interpolation by reference to two rates based on the relevant Floating Rate Option, where:
  - (A) one rate shall be determined as if the Designated Maturity were the period of time for which rates are available next shorter than the length of the relevant Interest Period; and
  - (B) the other rate shall be determined as if the Designated Maturity were the period of time for which rates are available next longer than the length of the relevant Interest Period

*provided, however*, that if there is no rate available for a period of time next shorter than the length of the relevant Interest Period or, as the case may be, next longer than the length of the relevant Interest Period, then the Calculation Agent shall determine such rate at such time and by reference to such sources as the Issuer (or an agent appointed by it) determines appropriate.

(e) ***Index-Linked Interest***

If the Index-Linked Interest Note Provisions are specified in the relevant Pricing Supplement as being applicable, the Rate(s) of Interest applicable to the Notes for each Interest Period will be determined in the manner specified in the relevant Pricing Supplement.

(f) ***Maximum or Minimum Rate of Interest***

If any Maximum Rate of Interest or Minimum Rate of Interest is specified in the relevant Pricing Supplement, then the Rate of Interest shall in no event be greater than the maximum or be less than the minimum so specified. If the relevant Pricing Supplement does not specify any Minimum Rate of Interest and the Rate of Interest as determined by the Calculation Agent according to this Condition is a negative value, the Rate of Interest shall be zero per cent. per annum.

(g) ***Step-up upon a Change of Control Triggering Event***

The Rate of Interest payable on the Notes will be subject to an increase of 1.25 per cent. upon the occurrence of a Change of Control Triggering Event (the Rate of Interest subject to such increase, the Reset Interest Rate). The Reset Interest Rate will have effect from and including the first interest payment

date following the date of the occurrence of such Change of Control Triggering Event and shall apply to all subsequent interest payment dates regardless of any future increase in the ratings of the Notes.

(h) ***Calculation of Interest Amount***

The Calculation Agent will, as soon as practicable after the time at which the Rate of Interest is to be determined in relation to each Interest Period, calculate the Interest Amount payable in respect of each Note for such Interest Period. The Interest Amount will be calculated by applying the Rate of Interest for such Interest Period to the Calculation Amount, multiplying the product by the relevant Day Count Fraction, rounding the resulting figure to the nearest sub-unit of the Specified Currency (half a sub-unit being rounded upwards) and multiplying such rounded figure by a fraction equal to the Specified Denomination of the relevant Note divided by the Calculation Amount. For this purpose a "sub-unit" means, in the case of any currency other than euro, the lowest amount of such currency that is available as legal tender in the country of such currency and, in the case of euro, means one cent.

(i) ***Calculation of other amounts***

If the relevant Pricing Supplement specifies that any other amount is to be calculated by the Calculation Agent, the Calculation Agent will, as soon as practicable after the time or times at which any such amount is to be determined, calculate the relevant amount. The relevant amount will be calculated by the Calculation Agent in the manner specified in the relevant Pricing Supplement.

(j) ***Publication***

The Calculation Agent will cause each Rate of Interest and Interest Amount determined by it, together with the relevant Interest Payment Date, and any other amount(s) required to be determined by it together with any relevant payment date(s) to be notified to the Issuer, the Guarantor (if applicable), the Paying Agents, and the Trustee as soon as practicable after such determination but (in the case of each Rate of Interest, Interest Amount and Interest Payment Date) in any event not later than the first day of the relevant Interest Period. Notice thereof shall also promptly be given by the Issuer to the Noteholders and each competent authority, stock exchange and/or quotation system (if any) by which the Notes have then been admitted to listing, trading and/or quotation. The Calculation Agent will be entitled to recalculate any Interest Amount (on the basis of the foregoing provisions) without notice in the event of an extension or shortening of the relevant Interest Period. If the Calculation Amount is less than the minimum Specified Denomination the Calculation Agent shall not be obliged to publish each Interest Amount but instead may publish only the Calculation Amount and the Interest Amount in respect of a Note having the minimum Specified Denomination.

(k) ***Notifications etc***

All notifications, opinions, determinations, certificates, calculations, quotations and decisions given, expressed, made or obtained for the purposes of this Condition by the Calculation Agent will (in the absence of manifest error) be binding on the Issuer, the Guarantor (if applicable), the Trustee, the Paying Agents, the Noteholders and (subject as aforesaid) no liability to any such Person will attach to the Calculation Agent in connection with the exercise or non-exercise by it of its powers, duties and discretions for such purposes.

(l) ***Benchmark Discontinuation***

If a Benchmark Event occurs in relation to the Reference Rate when the Rate of Interest (or any component part thereof) for any Interest Period remains to be determined by reference to such Reference Rate, then the Issuer shall use its reasonable endeavours to appoint an Independent Adviser, as soon as reasonably practicable, to determine a Successor Rate, failing which an Alternative Rate (in accordance with Condition 7(1)) and, in either case, an Adjustment Spread, if any (in accordance with Condition 7(1)(iii)) and any Benchmark Amendments (in accordance with Condition 7(1)(iv)).

In the absence of bad faith or fraud, the Independent Adviser shall have no liability whatsoever to the Issuer, the Guarantor, the Trustee, Agents or the Noteholders for any determination made by it pursuant to this Condition 7(1) and the Trustee and Agents will not be liable for any loss, liability, cost, charge or expense which may arise as a result thereof.

- (i) If (A) the Issuer is unable to appoint an Independent Adviser or (B) the Independent Adviser appointed by it fails to determine a Successor Rate or, failing which, an Alternative Rate in accordance with this Condition 7(1) prior to the relevant Interest Determination Date, the Reference Rate applicable to the immediate following Interest Period shall be the Reference Rate applicable as at the last preceding Interest Determination Date. If there has not been a first Interest Payment Date, the Reference Rate shall be the Reference Rate applicable to the first Interest Period. For the avoidance of doubt, any adjustment pursuant to this final paragraph of Condition 7(1) shall apply to the immediately following Interest Period only. Any subsequent Interest Period may be subject to the subsequent operation of this Condition 7(1).
- (ii) If the Independent Adviser determines in its discretion that:
  - (A) there is a Successor Rate, then such Successor Rate shall (subject to adjustment as provided in Condition 7(1)(iii)) subsequently be used in place of the Reference Rate to determine the Rate of Interest for the immediately following Interest Period and all following Interest Periods, subject to the subsequent operation of this Condition 7(1); or
  - (B) there is no Successor Rate but that there is an Alternative Rate, then such Alternative Rate shall (subject to adjustment as provided in Condition 7(i)(cc)) subsequently be used in place of the Reference Rate to determine the Rate of Interest for the immediately following Interest Period and all following Interest Periods, subject to the subsequent operation of this Condition 7(1).
- (iii) If the Independent Adviser determines in its discretion (A) that an Adjustment Spread is required to be applied to the Successor Rate or the Alternative Rate (as the case may be) and (B) the quantum of, or a formula or methodology for determining, such Adjustment Spread, then such Adjustment Spread shall apply to the Successor Rate or the Alternative Rate (as the case may be).
- (iv) If any relevant Successor Rate, Alternative Rate or Adjustment Spread is determined in accordance with this Condition 7(1) and the Independent Adviser determines in its discretion (i) that amendments to these Conditions are necessary to ensure the proper operation of such Successor Rate, Alternative Rate and/or Adjustment Spread (such amendments, the "**Benchmark Amendments**") and (ii) the terms of the Benchmark Amendments, then the Issuer shall, subject to giving notice thereof in accordance with Condition 7(1)(v), without any requirement for the consent or approval of relevant Noteholders, vary these Conditions to give effect to such Benchmark Amendments with effect from the date specified in such notice (and for the avoidance of doubt, the Trustee shall, at the direction and expense of the Issuer, consent to and effect such consequential amendments to the Trust Deed and these Conditions as may be required in order to give effect to this Condition 7(1)).
- (v) Any Successor Rate, Alternative Rate, Adjustment Spread and the specific terms of any Benchmark Amendments, determined under this Condition 7(1) will be notified promptly by the Issuer to the Trustee, the Calculation Agent, the Paying Agents and, in accordance with Condition 22 (*Notices*), the Noteholders. Such notice shall be irrevocable and shall specify the effective date of the Benchmark Amendments, if any.
- (vi) No later than notifying the Trustee of the same, the Issuer shall deliver to the Trustee a certificate signed by two authorised signatories of the Issuer:
  - (A) confirming (x) that a Benchmark Event has occurred, (y) the relevant Successor Rate, or, as the case may be, the relevant Alternative Rate and, (z) where applicable, any relevant Adjustment Spread and/or the specific terms of any relevant Benchmark Amendments, in each case as determined in accordance with the provisions of this Condition 7(1); and
  - (B) certifying that the relevant Benchmark Amendments are necessary to ensure the proper operation of such relevant Successor Rate, Alternative Rate and/or Adjustment Spread.

- (vii) The Successor Rate or Alternative Rate and the Adjustment Spread (if any) and the Benchmark Amendments (if any) specified in such certificate will (in the absence of manifest error or bad faith in the determination of such Successor Rate or Alternative Rate and such Adjustment Spread (if any) and such Benchmark Amendments (if any)) be binding on the Issuer, the Trustee and Principal Paying Agent, the Calculation Agent, the other Paying Agents and the Noteholders.

As used in this Condition 7(l):

**"Adjustment Spread"** means either a spread (which may be positive or negative), or the formula or methodology for calculating a spread, in either case, which the Independent Adviser determines is required to be applied to the relevant Successor Rate or the relevant Alternative Rate (as the case may be) to reduce or eliminate, to the extent reasonably practicable in the circumstances, any economic prejudice or benefit (as the case may be) to Noteholders as a result of the replacement of the Reference Rate with the Successor Rate or the Alternative Rate (as the case may be) and is the spread, formula or methodology which:

- (i) in the case of a Successor Rate, is formally recommended, or formally provided as an option for parties to adopt, in relation to the replacement of the Reference Rate with the Successor Rate by any Relevant Nominating Body; or
- (ii) (if no such recommendation has been made, or in the case of an Alternative Rate), the Independent Adviser, determines is customarily applied to the relevant Successor Rate or Alternative Rate (as the case may be) in international debt capital markets transactions to produce an industry-accepted replacement rate for the Reference Rate; or
- (iii) (if no such recommendation has been made, or in the case of an Alternative Rate) the Independent Adviser determines, is recognised or acknowledged as being the industry standard for over-the-counter derivative transactions which reference the Reference Rate, where such rate has been replaced by the Successor Rate or the Alternative Rate (as the case may be); or
- (iv) (if the Independent Adviser determines that no such industry standard is recognised or acknowledged) the Independent Adviser determines to be appropriate.

**"Alternative Rate"** means an alternative benchmark or screen rate which the Independent Adviser determines in accordance with Condition 7(l)(ii) is customary in market usage in the international debt capital markets for the purposes of determining floating rates of interest (or the relevant component part thereof) in the Specified Currency.

**"Benchmark Event"** means:

- (i) the relevant Reference Rate has ceased to be published on the Relevant Screen Page as a result of such benchmark ceasing to be calculated or administered; or
- (ii) a public statement by the administrator of the relevant Reference Rate that it has ceased, or will, by a specified date within the following six months, cease, publishing such Reference Rate permanently or indefinitely (in circumstances where no successor administrator has been appointed that will continue publication of such Reference Rate); or
- (iii) a public statement by the supervisor of the administrator of the relevant Reference Rate that such Reference Rate has been or will, by a specified date within the following six months, be permanently or indefinitely discontinued; or
- (iv) a public statement by the supervisor of the administrator of the relevant Reference Rate that means that such Reference Rate will, by a specified date within the following six months, be prohibited from being used or that its use will be subject to restrictions or adverse consequences, either generally or in respect of the Notes; or
- (v) a public statement by the supervisor of the administrator of the relevant Reference Rate (as applicable) that, in the view of such supervisor, (i) such Reference Rate is no longer

representative of an underlying market or (ii) the methodology to calculate such Reference Rate has materially changed ; or

- (vi) it has or will, by a specified date within the following six months, become unlawful for the Calculation Agent to calculate any payments due to be made to any Noteholder using the relevant Reference Rate (as applicable) (including, without limitation, under the Benchmarks Regulation (EU) 2016/1011, if applicable).

"**Benchmark Amendments**" has the meaning given to it in Condition 7(1)(i).

"**Independent Adviser**" means an independent financial institution of international repute or other independent financial adviser experienced in the international capital markets, in each case appointed by the Issuer at its own expense under Condition 7(1)(i).

"**Relevant Nominating Body**" means, in respect of a benchmark or screen rate (as applicable):

- (i) the central bank for the currency to which the benchmark or screen rate (as applicable) relates, or any central bank or other supervisory authority which is responsible for supervising the administrator of the benchmark or screen rate (as applicable); or
- (ii) any working group or committee sponsored by, chaired or co-chaired by or constituted at the request of (a) the central bank for the currency to which the benchmark or screen rate (as applicable) relates, (b) any central bank or other supervisory authority which is responsible for supervising the administrator of the benchmark or screen rate (as applicable), (c) a group of the aforementioned central banks or other supervisory authorities or (d) the Financial Stability Board or any part thereof.

"**Successor Rate**" means a successor to or replacement of the Reference Rate which is formally recommended by any Relevant Nominating Body.

## 8. **Zero Coupon Note Provisions**

### (a) ***Application***

This Condition 8 is applicable to the Notes only if the Zero Coupon Note Provisions are specified in the relevant Pricing Supplement as being applicable.

### (b) ***Late payment on Zero Coupon Notes***

If the Redemption Amount payable in respect of any Zero Coupon Note is improperly withheld or refused, the Redemption Amount shall thereafter be an amount equal to the sum of:

- (i) the Reference Price; and
- (ii) the product of the Accrual Yield (compounded annually) being applied to the Reference Price on the basis of the relevant Day Count Fraction from (and including) the Issue Date to (but excluding) whichever is the earlier of (A) the day on which all sums due in respect of such Note up to that day are received by or on behalf of the relevant Noteholder and (B) the day which is seven days after the Principal Paying Agent or the Trustee has notified the Noteholders of receipt of all sums due in respect of the Notes up to such seventh day (except to the extent that there is any subsequent default in payment).

## 9. **Dual Currency Note Provisions**

### (a) ***Application***

This Condition 9 is applicable to the Notes only if the Dual Currency Note Provisions are specified in the relevant Pricing Supplement as being applicable.

(b) ***Rate of Interest***

If the rate or amount of interest falls to be determined by reference to an exchange rate, the rate or amount of interest payable shall be determined in the manner specified in the relevant Pricing Supplement.

10. **Redemption and Purchase**

(a) ***Scheduled redemption***

Unless previously redeemed, or purchased and cancelled, each Note will be redeemed at its Final Redemption Amount on the Maturity Date, subject as provided in Condition 11 (*Payments*).

(b) ***Optional Tax Redemption***

The Notes may be redeemed at the option of the Issuer in whole, but not in part, at the relevant Early Redemption Amount (Tax), upon not less than 10 nor more than 60 days' written notice:

- (i) at any time (if neither the Floating Rate Note Provisions nor the Index-Linked Interest Note Provisions are specified in the relevant Pricing Supplement as being applicable); or
- (ii) on any Interest Payment Date (if the Floating Rate Note Provisions or the Index-Linked Interest Note Provisions are specified in the relevant Pricing Supplement as being applicable),

if, as a result of any change in, or amendment to, the tax laws of a Taxing Jurisdiction (as defined in Condition 12 (*Additional Amounts*)) or any regulations or ruling promulgated thereunder or any change in the official interpretation or official application of such laws, regulations or rulings, which change or amendment becomes effective on or after the Issue Date of the Notes (or in the case of a jurisdiction that becomes a Taxing Jurisdiction at a later date, after such date):

- (A) the Issuer is, or would be, obligated on the next succeeding due date for a payment with respect to the Notes to pay Additional Amounts (as defined in Condition 12 (*Additional Amounts*)) and such obligation cannot be avoided by the use of reasonable measures available to the Issuer; or
- (B) the Guarantor (if applicable) is, or would be (if a demand was made under the Guarantee), obligated on the next succeeding due date for a payment with respect to the Notes to pay Additional Amounts (as defined in Condition 12 (*Additional Amounts*)) under the Guarantee and such obligation cannot be avoided by the use of reasonable measures available to the Guarantor (if applicable);

in each case **provided that** changing the jurisdiction of the Issuer or the Guarantor (as applicable) is not a reasonable measure, but changing the jurisdiction of the Paying Agent may be a reasonable measure, for purposes of this Condition; **provided further that** where any such requirement to pay Additional Amounts is due to taxes of the Kingdom of Thailand (or any political subdivision or taxing authority thereof or therein), the Issuer shall be permitted to redeem the Notes in accordance with the provisions above only if the rate of withholding or deduction in respect of which Additional Amounts are required is in excess of 15 per cent; and **provided further that** (i) no such written notice of redemption may be given earlier than 60 days prior to the earliest date on which the Issuer or the Guarantor (as applicable) would be obligated to pay such Additional Amounts if a payment in respect of the Notes were then due or (as the case may be) a demand under the Guarantee were then made, and (ii) at the time such written notice of redemption is given, such obligation to pay such Additional Amounts remains in effect.

Prior to any redemption of any Notes, the Issuer will deliver to the Trustee, to be made available for inspection by Noteholders, (a) an Opinion of Counsel of recognized standing with respect to tax matters in the relevant Taxing Jurisdiction that the requirement to pay such Additional Amounts results from such change or amendment in law occurring on or after the Issue Date (or such later date specified above) of the Notes and (b) an Officer's Certificate stating that the Issuer is entitled to effect such redemption and setting forth a statement of facts showing that the conditions precedent to the right of redemption

have occurred including that the Issuer's or the Guarantor's (if applicable) obligation to pay Additional Amounts giving rise to the right of redemption cannot be avoided by the use of reasonable measures available to the Issuer or the Guarantor (if applicable).

The Trustee shall be entitled without further enquiry to accept and rely upon such Opinion of Counsel and Officer's Certificate as sufficient evidence of the satisfaction of the circumstances set out above, in which event they shall be conclusive and binding on the Noteholders.

(c) ***Optional Redemption***

If the Call Option is specified in the relevant Pricing Supplement as being applicable, the Notes may be redeemed at the option of the Issuer in whole or, if so specified in the relevant Pricing Supplement, in part on any Optional Redemption Date (Call) at the relevant Optional Redemption Amount (Call) on the Issuer's giving not less than 10 nor more than 60 days' notice to the Noteholders (which notice shall, subject to Condition 10(i) (*Conditional Redemption and Notices*)), be irrevocable and shall oblige the Issuer to redeem the Notes or, as the case may be, the Notes specified in such notice on the relevant Optional Redemption Date (Call) at the Optional Redemption Amount (Call) *plus* accrued and unpaid interest (if any) to such date).

(d) ***Partial redemption***

If the Notes are to be redeemed in part only on any date in accordance with Condition 10(c) (*Optional Redemption*) above, each Note shall be redeemed in part in the proportion which the aggregate principal amount of the outstanding Notes to be redeemed on the relevant Optional Redemption Date (Call) bears to the aggregate principal amount of outstanding Notes on such date. If any Maximum Redemption Amount or Minimum Redemption Amount is specified in the relevant Pricing Supplement, then the Optional Redemption Amount (Call) shall in no event be greater than the maximum or be less than the minimum so specified.

(e) ***No other redemption***

The Issuer shall not be entitled to redeem the Notes otherwise than as provided in Conditions 10(a) to 10(d) above.

(f) ***Early redemption of Zero Coupon Notes***

Unless otherwise specified in the relevant Pricing Supplement, the Redemption Amount payable on redemption of a Zero Coupon Note at any time before the Maturity Date shall be an amount equal to the sum of:

- (i) the Reference Price; and
- (ii) the product of the Accrual Yield (compounded annually) being applied to the Reference Price from (and including) the Issue Date to (but excluding) the date fixed for redemption or (as the case may be) the date upon which the Note becomes due and payable.

Where such calculation is to be made for a period which is not a whole number of years, the calculation in respect of the period of less than a full year shall be made on the basis of such Day Count Fraction as may be specified in the Pricing Supplement for the purposes of this Condition 10(f) or, if none is so specified, a Day Count Fraction of 30E/360 (ISDA).

(g) ***Repurchase***

The Company and any of its Subsidiaries (including Treasury Center) may, in accordance with all applicable laws and regulations, at any time purchase Notes in the open market or otherwise at any price. If purchases are made by tender, such tender must be made available to all Holders of the Notes alike. Any Notes the Company or any of its Subsidiaries (including Treasury Center) repurchase may be held, cancelled or sold.

(h) ***Calculations***

Neither the Trustee nor any of the Agents (other than the Calculation Agent and solely in respect of its functions as an appointed Calculation Agent of the Issuer and the Guarantor (if applicable)) shall be responsible for calculating or verifying the calculations of any amount payable under any notice of redemption and shall not be liable to the Noteholders or any other person for not doing so.

(i) ***Conditional Redemption and Notices***

Any redemption and notice may, in an Issuer's discretion, be subject to the satisfaction of one or more conditions precedent (including, without limitation, the incurrence of indebtedness the proceeds of which will be used to redeem the Notes). In addition, if such redemption or notice is subject to satisfaction of one or more conditions precedent, such notice may state that, at an Issuer's discretion, the redemption date may be delayed until such time as any or all such conditions shall be satisfied, or such redemption may not occur and such notice may be rescinded if any or all such conditions shall not have been satisfied by the redemption date, or by the redemption date so delayed.

11. **Payments**

(a) ***Principal***

Payments of principal and premium shall be made (i) in the case of a currency other than Renminbi, not later than the fifteenth day before the due date for any such payment, by transfer to an account denominated in that currency (or, if that currency is euro, any other account to which euro may be credited or transferred) and maintained by the payee with, a bank in the Principal Financial Centre of that currency, and (ii) in the case of Renminbi, by transfer to an account denominated in that currency and maintained by the payee with a bank in the Principal Financial Centre of that currency, and (in the case of redemption) upon surrender (or, in the case of part payment only, endorsement) of the relevant Note Certificates at the Specified Office of any Paying Agent.

(b) ***Interest***

Payments of interest shall be made (i) in the case of a currency other than Renminbi, not later than the fifteenth day before the due date for any such payment, by transfer to an account denominated in that currency (or, if that currency is euro, any other account to which euro may be credited or transferred) and maintained by the payee with, a bank in the Principal Financial Centre of that currency, and (ii) in the case of Renminbi, by transfer to an account denominated in that currency and maintained by the payee with a bank in the Principal Financial Centre of that currency, and (in the case of interest payable on redemption) upon surrender (or, in the case of part payment only, endorsement) of the relevant Note Certificates at the Specified Office of any Paying Agent.

(c) ***Payments subject to fiscal laws***

All payments in respect of the Notes are subject in all cases to (i) any applicable fiscal or other laws and regulations in the place of payment, but (except as described in (ii) below) subject to Condition 12 (*Additional Amounts*), and (ii) any withholding or deduction required pursuant to an agreement described in Section 1471(b) of the Code or otherwise imposed pursuant to Sections 1471 through 1474 of the Code, as of the issue date (or any amended or successor version of such sections) any regulations or agreements thereunder, any official interpretations thereof, or any similar law implementing any intergovernmental agreement between a non-U.S. jurisdiction and the United States with respect to the foregoing. No commissions or expenses shall be charged to the Noteholders in respect of such payments.

(d) ***Payments on business days***

Where payment is to be made by transfer to an account, payment instructions (for value the due date, or, if the due date is not Payment Business Day, for value the next succeeding Payment Business Day) will be initiated (i) (in the case of payments of principal, premium and interest payable on redemption) on the later of the due date for payment and the day on which the relevant Note Certificate is surrendered (or, in the case of part payment only, endorsed) at the Specified Office of a Paying Agent and (ii) (in the case of payments of interest payable other than on redemption) on the due date for payment. A Holder of a



Note shall not be entitled to any interest or other payment in respect of any delay in payment resulting from the due date for a payment not being a Payment Business Day.

(e) ***Partial payments***

If a Paying Agent makes a partial payment in respect of any Note, the Issuer shall procure that the amount and date of such payment are noted on the Register and, in the case of partial payment upon presentation of a Note Certificate, that a statement indicating the amount and the date of such payment is endorsed on the relevant Note Certificate.

(f) ***Record date***

Each payment in respect of a Note will be made to the person shown as the Holder in the Register at the opening of business in the place of the Registrar's Specified Office on the fifth (in the case of Renminbi) and fifteenth (in the case of a currency other than Renminbi) day before the due date for such payment (the "**Record Date**").

*So long as the Global Note Certificate is held on behalf of Euroclear Bank SA/NV ("**Euroclear**") and/or Clearstream Banking S.A. ("**Clearstream**", The Depository Trust Company ("**DTC**") or any other clearing system, each payment in respect of the Global Note Certificate will be made to the person shown as the holder in the Register at the close of business of the relevant clearing system on the Clearing System Business Day before the due date for such payments, where "Clearing System Business Day" means a weekday (Monday to Friday, inclusive) except 25 December and 1 January.*

12. **Additional Amounts**

All payments, including, without limitation, payments of principal, redemption price, purchase price, premium and interest in respect of the Notes or under the Guarantee (if applicable) by or on behalf of the Issuer or (with respect to the Guaranteed Notes) the Guarantor shall be made free and clear of, and without withholding or deduction for present or future taxes, duties, assessments, fees or other governmental charges imposed by the Kingdom of Thailand or any other jurisdiction in which the Issuer or the Guarantor (if applicable) is tax resident (or of any political subdivision or taxing authority thereof or therein) or any jurisdiction through which the Issuer, the Guarantor (if applicable) or its Agent makes payment (each such jurisdiction a "**Taxing Jurisdiction**"), unless such withholding or deduction is required by law or by regulation or any governmental policy having the force of law. In the event that any such withholding or deduction is so required, the Issuer (failing which, with respect to Guaranteed Notes, the Guarantor) will pay additional amounts ("**Additional Amounts**") as necessary to ensure that the Holder will receive the same amount as would have been received without any such withholding or deduction.

However, no Additional Amounts will be payable by the Issuer, the Guarantor (if applicable) or its Agent to the extent that such Additional Amounts are required to be paid because:

- (i) a Holder or beneficial owner (or, if the holder or beneficial owner is a trust, partnership, limited liability company or a corporation, its beneficiaries, partners, members or shareholders) was or is connected with a Taxing Jurisdiction (including, without limitation, being a citizen or resident or national of, or carrying on a business or maintaining a permanent establishment in, or being physically present in, a Taxing Jurisdiction) other than by merely owning the Note or receiving income or payments on the Note or the Guarantee;
- (ii) a Holder or beneficial owner failed, after a timely request by the Issuer, the Guarantor (if applicable) or a relevant taxing authority, to (a) provide information concerning its nationality, residence or identity or connection with a Taxing Jurisdiction or (b) make any declaration or other similar claim or satisfy any information or reporting requirement;
- (iii) a Holder failed to present a Note or the Guarantee for payment within 30 days of when the payment is due (when presentation is required), except that, the relevant payor will pay Additional Amounts to the extent the holder would have been entitled to such amounts had the holder presented the Note or the Guarantee for payment on the last day of the 30-day period;

- (iv) a Holder would have been able to avoid the withholding or deduction by the presentation (where presentation is required) of the relevant Note or the Guarantee to, or otherwise accepting payment from, another paying agent, but failed to do so;
- (v) any withholding or deduction is required pursuant to an agreement described in Section 1471(b) of the Code, or otherwise imposed pursuant to Sections 1471 through 1474 of the Code, as of the issue date (or any amended or successor version of such sections), any regulations or agreements thereunder, any official interpretations thereof, or any similar law implementing an intergovernmental agreement between a non-U.S. jurisdiction and the United States with respect to the foregoing; or
- (vi) any withholding or deduction that is required as a result of any combination of the above.

Neither the Issuer, the Guarantor (if applicable) nor any of their agents will pay any Additional Amounts for taxes on the Notes or the Guarantee except for taxes payable through deduction or withholding from payments of principal, premium (if any) or interest on the Notes. Examples of the types of taxes for which no Additional Amounts will be paid include the following: estate or inheritance taxes, gift taxes, sales or transfer taxes, personal property or related taxes, assessments or other governmental charges. The Issuer (failing which, the Guarantor (if applicable)) will pay stamp or other similar taxes that may be imposed by any Taxing Jurisdiction as a result of entering into, registering or enforcing the Indenture or may be payable in connection with the issuance of the Notes or any other document or instrument referred to therein (limited, solely in the case of taxes attributable to the receipt of any payments with respect thereto, to any such taxes which are not excluded under clauses (i) through (vi) above or any combination thereof).

In addition, with respect to any payment of the principal of, or premium (if any) or interest on, a Note, if the Holder of a Note is a fiduciary, partnership, limited liability company or person other than the sole beneficial owner of any payment, neither the Issuer nor the Guarantor (if applicable) shall be required to pay any Additional Amounts with respect to taxes imposed by a Taxing Jurisdiction to the extent that such payment would be required to be included in the income under the laws of a Taxing Jurisdiction of a beneficiary or settlor, with respect to the fiduciary, or a member of that partnership or limited liability company or a beneficial owner who would not have been entitled to such Additional Amounts had that beneficiary, settlor, partner or member, or beneficial owner been the Holder of such Note.

References to principal, premium (if any) or interest in respect of the Notes will be deemed also to refer to any Additional Amounts which may be payable as set forth in the Notes and the Indenture.

The above obligation will survive any termination, defeasance or discharge of the Indenture, any transfer by a holder or beneficial owner of its Notes, and will apply, *mutatis mutandis*, to any jurisdiction in which any successor Person to the Issuer or the Guarantor (if applicable) is then incorporated, organized, engaged in business or resident for tax purposes or any jurisdiction from or through which such person makes any payment on the notes (or the Guarantee) and any political subdivision or taxing authority or agency thereof or therein having the power to tax.

### 13. **Events of Default**

The occurrence and continuance of the following events will constitute events of default ("**Events of Default**"):

- (a) failure to pay interest (including premium, if any) on the Notes as and when the same will become due and payable, and continuance of such default for a period of 14 days;
- (b) failure to pay principal on the Notes when due, and continuance of such default for a period of 7 days, whether at Maturity Date, upon redemption or otherwise;
- (c) failure by the Issuer or the Guarantor (if applicable) to comply with its obligations under the covenant described under Condition 5(b) (*Certain Covenants—Consolidation, Merger and Sale of Assets*);

- (d) failure on the part of the Issuer or the Guarantor (if applicable) to duly observe or perform any of the other covenants or agreements on the part of the Issuer or the Guarantor (if applicable), as the case may be, contained in the Notes or in the Indenture relating to the Notes or the Guarantee that continues for 60 days after the date on which written notice specifying such failure, stating that such notice is a "Notice of Default" under the Notes and demanding that the Issuer or the Guarantor (if applicable) remedy the same, shall have been sent to the Issuer or the Guarantor (if applicable) by the Trustee, or to the Issuer or the Guarantor (if applicable) at the office of the Trustee by the holders of at least 25 per cent. in aggregate principal amount of the outstanding Notes;
- (e) any of the Issuer's or (while there are any Guaranteed Notes outstanding) the Guarantor's Indebtedness of an amount equal to or greater than U.S.\$25,000,000 either (a) becoming due and payable prior to the due date for payment thereof by reason of acceleration following a default by the Issuer or the Guarantor (if applicable), or (b) not being repaid by the Issuer or the Guarantor (if applicable) at, and remaining unpaid after, maturity (as extended by the grace period, if any), or any guarantee given by the Issuer or (while there are any Guaranteed Notes outstanding) the Guarantor in respect of any Indebtedness of any other Person of an amount equal to or greater than U.S.\$25,000,000 not being honored and remaining dishonored after becoming due and called;
- (f) a court or administrative or other governmental agency or body having jurisdiction in the premises shall enter a decree or order for relief in respect of the Issuer or (while there are any Guaranteed Notes outstanding) the Guarantor in an involuntary case under any applicable bankruptcy, insolvency, reorganization, compulsory composition or other similar law now or hereafter in effect, or appointing a receiver, liquidator, assignee, custodian, trustee, sequestrator (or similar official) of the Issuer or (while there are any Guaranteed Notes outstanding) the Guarantor or for any substantial part of its property or ordering the winding up, dissolution or liquidation of its affairs, or shall otherwise adjudicate or find the Issuer or (while there are any Guaranteed Notes outstanding) the Guarantor to be bankrupt or insolvent, and such decree or order shall remain unstayed and in effect for a period of 60 consecutive days;
- (g) the Issuer or (while there are any Guaranteed Notes outstanding) the Guarantor shall commence a voluntary case under any applicable bankruptcy, insolvency, reorganization, compulsory composition or other similar law now or hereafter in effect, or consent to the entry of an order for relief in an involuntary case under any such law, or consent to the appointment or taking possession by a receiver, liquidator, assignee, custodian, trustee, sequestrator or similar official of the Issuer or (while there are any Guaranteed Notes outstanding) the Guarantor or for any substantial part of any of its property, or the Issuer or (while there are any Guaranteed Notes outstanding) the Guarantor ceases to carry on the whole or substantially the whole of its business or make any general assignment for the benefit of creditors, or enter into any composition with any of its respective creditors, or take corporate action in furtherance of any such action; or
- (h) (while there are any Guaranteed Notes outstanding) the Guarantee is not (or is claimed by the Guarantor not to be) in full force and effect.

If an Event of Default (other than an Event of Default described in clauses (f) or (g) above) with respect to the Notes shall occur and be continuing, either the Trustee or the Holders of at least 25 per cent. in aggregate principal amount of the Notes then outstanding by written notice to the Issuer and (while there are any Guaranteed Notes outstanding) the Guarantor (and to the Trustee if given to the Holders) may declare the principal amount of the Notes and any accrued and unpaid interest thereon to be due and payable immediately. If an Event of Default in clause (f) or (g) above with respect to the Notes shall occur, the unpaid principal amount of all the Notes and any accrued and unpaid interest thereon will automatically, and without any action by the Trustee or any Holder of Notes, become immediately due and payable. After any such acceleration but before a judgment or decree based on acceleration has been obtained, the Holders of at least a majority in aggregate principal amount of the Notes then outstanding may, under certain circumstances, rescind and annul such acceleration if all Events of Default, other than the non-payment of accelerated principal, have been cured or waived as provided in the Indenture.

In the event of a declaration of acceleration of the Notes because of an Event of Default described in clause (d) has occurred and is continuing, the declaration of acceleration of the Notes will be automatically annulled if the acceleration described in clause (d)(a) above, the failure to pay described

in clause (d)(b) above, or the failure to honor a guarantee described in clause (d), as the case may be, constituting such Event of Default pursuant to clause (d) is rescinded and annulled or cured, as the case may be, by the Issuer or the Guarantor (if applicable) or waived by the holder of such Indebtedness within 20 days after such declaration of acceleration of the Notes, **provided that** (1) the annulment of the acceleration of the Notes would not conflict with any judgment or decree of a court of competent jurisdiction and (2) all existing Events of Default, except with respect to the payment of principal of, premium (if any), Additional Amounts or interest on any Notes that became due solely because of the acceleration of the Notes, have been cured or waived.

Subject to the provisions of the Indenture relating to the duties of the Trustee, in case an Event of Default shall occur and be continuing, the Trustee will be under no obligation to exercise any of its rights or powers under the Indenture at the request or direction of any of the Holders of Notes unless such Holders shall have offered to the Trustee security, pre-funding and/or indemnity satisfactory to the Trustee. Subject to certain provisions, including those requiring security, pre-funding and/or indemnification of the Trustee, the Holders of a majority in aggregate principal amount of the Notes then outstanding will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the Trustee or exercising any trust or power conferred on the Trustee with respect to the Notes. No Holder will have any right to institute any proceeding, judicial or otherwise, with respect to the Indenture, or for the appointment of a receiver or a trustee, or for any other remedy thereunder unless (i) such Holder has previously given to the Trustee written notice of a continuing Event of Default with respect to the Notes, (ii) the Holders of at least 25 per cent. in aggregate principal amount of the Notes then outstanding have made written request, and such Holder or Holders have offered to the Trustee security, pre-funding and/or indemnity satisfactory to the Trustee, to institute such proceeding as trustee and (iii) the Trustee has failed to institute such proceeding, and has not received from the Holders of a majority in aggregate principal amount of the Notes then outstanding a direction inconsistent with such request, within 60 days after such written notice, request and offer. However, such limitations do not apply to a suit instituted by a Holder of a Note for the enforcement of the right to receive payment of the principal of or interest on such Note on or after the applicable due date specified in such Note.

#### 14. **Prescription**

Any moneys deposited with or paid to the Trustee or any Paying Agent of the Notes, or then held by the Issuer or the Guarantor (if applicable) for the payment of the principal of, premium (if any) or interest on (or any Additional Amount payable in respect of) any Note or the Guarantee (if applicable) and not applied but remaining unclaimed for two years after the date upon which such principal, premium (if any) or interest shall have become due and payable, shall, upon the written request of the Issuer or the Guarantor (if applicable) be repaid to the Issuer or the Guarantor (if applicable) by the Trustee or such Paying Agent or (if then held by the Issuer or the Guarantor (if applicable)) be discharged unless otherwise required by mandatory provisions of applicable escheat or abandoned or unclaimed property law, and the Holder shall, unless otherwise required by mandatory provisions of applicable escheat or abandoned or unclaimed property laws, thereafter look only to the Issuer or the Guarantor (if applicable) for any payment which such Holder may be entitled to collect, and all liability of the Trustee or any Paying Agent of the Notes with respect to such moneys shall thereupon cease.

Under New York law, any legal action upon the Notes must be commenced within six years after the payment thereof is due. Thereafter, the Notes will generally become unenforceable.

#### 15. **Replacement of Notes**

If any Note or Note Certificate is lost, stolen, mutilated, defaced or destroyed, it may be replaced at the Specified Office of the Registrar (and, if the Notes are then admitted to listing, trading and/or quotation by any competent authority, stock exchange and/or quotation system which requires the appointment of a Paying Agent or Transfer Agent in any particular place, the Paying Agent or Transfer Agent having its Specified Office in the place required by such competent authority, stock exchange and/or quotation system), subject to all applicable laws and competent authority, stock exchange and/or quotation system requirements, upon payment by the claimant of the expenses incurred in connection with such replacement and on such terms as to evidence, security, indemnity and otherwise as the Issuer may reasonably require. Mutilated or defaced Notes or Note Certificates must be surrendered before replacements will be issued.

16. **Modification and Waiver**

(a) ***Modification with consent of Holders***

With the consent of the Holders of more than 50 per cent. in aggregate principal amount of the outstanding Notes, the Issuer or the Guarantor (if applicable) may execute supplemental indentures or modify, amend or supplement the Conditions or the Paying and Transfer Agent and Registrar Appointment Letter with the Trustee and Agents, as the case may be, to add provisions or change or eliminate any provision of the Indenture, any supplemental indenture, the Paying and Transfer Agent and Registrar Appointment Letter or the Conditions to modify, amend or supplement the rights of the Holders of the Notes. Without the consent of the Holders of all the outstanding Notes, however, no such supplemental indenture or modification, amendment or supplementation will, with respect to the Notes or the Guarantee:

- (i) change their stated maturity;
- (ii) reduce the principal amount payable, reduce the stated rate of (including the Reset Interest Rate), or extend the stated time for payment of, interest on any Note;
- (iii) change the obligation of the Issuer or (with respect to Guaranteed Notes) the Guarantor to pay Additional Amounts;
- (iv) change the terms of the Guarantee;
- (v) change the place or currency in which they are payable;
- (vi) impair the right to institute suit for their enforcement;
- (vii) waive a Default in the payment of principal of, premium (if any) or interest on the Notes;
- (viii) reduce the percentage in principal amount of the outstanding Notes, the consent of the holders of which is required for any such supplemental indenture or for any modification to the provisions relating to modification and waiver; or
- (ix) reduce the premium payable upon the redemption or repurchase of any Note or change the time at which any Note may be redeemed or repurchased as described above under Condition 10(b) (*Optional Tax Redemption*) or Condition 10(c) (*Optional Redemption*).

The Holders of more than 50 per cent. in aggregate principal amount of the outstanding Notes may:

- (a) waive compliance by the Issuer and Guarantor (if applicable) with certain provisions of the Indenture, the Conditions, the Guarantee or the Paying and Transfer Agent and Registrar Appointment Letter; and
- (b) waive any past Default (except Defaults relating to payment of principal of, premium (if any) or interest on any Note).

(b) ***Modification without consent of Holders***

Notwithstanding the foregoing, the Issuer, the Guarantor (if applicable), the Trustee and the Agents may, without notice to or the consent or vote of any Holder of the Notes, amend or supplement the Indenture, the Notes or the Guarantee (if applicable) or modify, amend or supplement the Conditions or the Paying and Transfer Agent and Registrar Appointment Letter, in each case, for one or more of the following purposes (it being understood that such modification, amendment or supplement shall not materially and adversely affect the rights of the Holders of the Notes):

- (i) to cure any ambiguity, omission, defect or inconsistency (including, without limitation, any inconsistency between the text of the Indenture, the Paying and Transfer Agent and Registrar Appointment Letter, the Guarantee or the Notes and the description of the Indenture, the Paying

and Transfer Agent and Registrar Appointment Letter, the Guarantee or the Notes contained in the Offering Memorandum);

- (ii) to comply with the covenant described under Condition 5(b) (*Certain Covenants—Consolidation, Merger and Sale of Assets*);
- (iii) to evidence and provide for the appointment of a successor Trustee or Agent;
- (iv) to add guarantors or guarantees with respect to such Notes;
- (v) to add to the covenants of the Issuer and the Guarantor (if applicable) for the benefit of Holders of such Notes;
- (vi) to surrender any right conferred by the relevant Indenture upon the Issuer or the Guarantor (if applicable);
- (vii) to enter into a supplemental indenture, in any case where a supplemental indenture is required or permitted to be entered into pursuant to the provisions of the Indenture without the consent of any Holder;
- (viii) to effect any changes to the Indenture, the Conditions or the Paying and Transfer Agent and Registrar Appointment Letter in a manner necessary to comply with the procedures of DTC, Euroclear or Clearstream or any other clearing system;
- (ix) to provide for the issuance of additional Notes in accordance with the limitations set forth in the Indenture and the Conditions;
- (x) to provide for Global Note Certificates in addition to or in place of Note Certificates;
- (xi) to provide collateral to secure the Notes; or
- (xii) to make any other change that does not materially and adversely affect the rights of any Holder.

17. **Concerning the Trustee**

The Holders of more than 50 per cent. in aggregate principal amount of all outstanding Notes shall have the right to direct the time, method and place of conducting any proceeding for exercising any remedy or power available to the Trustee with respect to the Notes. However, the direction must not conflict with any rule of law or with the Indenture. In case of an Event of Default, the Trustee shall be required to exercise its powers with the degree of care and skill of a prudent person in the conduct of his own affairs. The Trustee is, however, under no obligation to exercise any of its rights or powers under the Indenture at the request of any of the Holders, unless they have offered to the Trustee security, pre-funding or indemnity satisfactory to the Trustee against the costs, expenses and liabilities that might be incurred by it in compliance with such request or direction in its sole discretion.

Under the Indenture, the Trustee is entitled to be indemnified, pre-funded and/or provided with security to its satisfaction, as well as relieved from responsibility in certain circumstances and to be paid its fees, costs and expenses in priority to the claims of the Noteholders. In addition, the Trustee is entitled to enter into business transactions with Treasury Center or the Company and any entity relating to Treasury Center or the Company without accounting for any profit.

In connection with the exercise by it of any of its trusts, powers, authorities and discretions (including, without limitation, any modification, waiver, authorization or determination), the Trustee shall have regard to the general interests of the Noteholders as a class (but shall not have regard to any interests arising from circumstances particular to individual Noteholders whatever their number) and, in particular but without limitation, shall not have regard to the consequences of any such exercise for individual Holders (whatever their number) resulting from their being for any purpose domiciled or resident in, or otherwise connected with, or subject to the jurisdiction of, any particular territory or any political subdivision thereof and the Trustee shall not be entitled to require, nor shall any Noteholder be entitled to claim, from the Issuer, the Guarantor (if applicable), the Trustee or any other person any indemnification

or payment in respect of any tax consequences of any such exercise upon individual Noteholders except to the extent already provided for under Condition 12 (*Additional Amounts*) and/or any undertaking or covenant given in addition to, or in substitution for, Condition 12 (*Additional Amounts*) pursuant to the Indenture.

The Trustee may rely without liability to Noteholders on a report, confirmation or certificate or any advice of any lawyers, accountants, financial advisors, financial institution or any other expert, whether or not addressed to it and whether their liability in relation thereto is limited (by its terms or by any engagement letter relating thereto or in any other manner) by reference to a monetary cap, methodology or otherwise. The Trustee may accept and shall be entitled to rely on any such report, confirmation or certificate or advice and such report, confirmation or certificate or advice shall be binding on the Issuer, the Guarantor (if applicable), the Trustee and the Noteholders.

#### 18. **The Agents**

In acting under the Indenture and the Paying and Transfer Agent and Registrar Appointment Letter and in connection with the Notes, the Agents act solely as agents of the Issuer, the Guarantor (if applicable) and (to the extent provided therein) the Trustee and do not assume any obligations towards or relationship of agency or trust for or with any of the Noteholders.

The initial Calculation Agent (if any) is specified in the relevant Pricing Supplement. The Issuer and the Guarantor (if applicable) reserve the right (with the prior approval of the Trustee) at any time to vary or terminate the appointment of any Agent and to appoint a successor principal paying agent or registrar or Calculation Agent and additional or successor paying agents; *provided, however, that:*

- (a) the Issuer and the Guarantor (if applicable) shall at all times maintain a principal paying agent and a registrar; and
- (b) if a Calculation Agent is specified in the relevant Pricing Supplement, the Issuer and the Guarantor (if applicable) shall at all times maintain a Calculation Agent; and
- (c) for so long as the Notes are listed on the SGX-ST and the rules of the SGX-ST so require, the Issuer and the Guarantor (if applicable) shall maintain a Paying Agent in Singapore, where the Notes may be presented or surrendered for payment or redemption, in the event that global notes are exchanged for definitive notes; and
- (d) if and for so long as the Notes are admitted to listing, trading and/or quotation by any competent authority, stock exchange and/or quotation system which requires the appointment of a Paying Agent and/or a Transfer Agent in any particular place, the Issuer and the Guarantor (if applicable) shall maintain a Paying Agent and/or a Transfer Agent having its Specified Office in the place required by such competent authority, stock exchange and/or quotation system.

Notice of any change in any of the Agents or in their Specified Offices shall promptly be given to the Noteholders by the Issuer.

#### 19. **Further Issuance**

The Issuer may from time to time, without notice to or the consent of the Noteholders, create and issue further debt securities ranking *pari passu* with the Notes in all respects (or in all respects except for the payment of interest accruing prior to the issue date of the debt securities or except for the first payment of interest following the issue date of the debt securities). The Issuer may consolidate such further debt securities with the outstanding Notes to form a single Series; **provided that**, if any further debt securities issued are not fungible for U.S. federal income tax purposes with any Notes previously issued, such further debt securities shall trade separately from such previously issued Notes under different CUSIP, ISIN and common codes from those assigned to the Notes but shall otherwise be treated as a single Series with all other Notes issued under the Indenture.

20. **Payment for consent**

Neither the Company nor any of its Subsidiaries will, directly or indirectly, pay or cause to be paid any consideration, whether by way of interest, fee or otherwise, to any Holder for or as an inducement to any consent, waiver or amendment of any of the terms or provisions of the Indenture or the Notes unless such consideration is offered to be paid or agreed to be paid to all Holders that consent, waive or agree to amend in the time frame set forth in the solicitation documents relating to such consent, waiver or agreement.

21. **Defeasance and Discharge**

The Issuer and the Guarantor (if applicable) shall not be required to comply with certain restrictive covenants of the Indenture (including the limitations on liens) with respect to the Notes or the Guarantee, if:

- (a) the Issuer deposits with the Trustee, in trust, money or U.S. Government Obligations (or a combination thereof) sufficient to pay the principal of, and interest on, the Notes when due;
- (b) there is no Default under the Indenture;
- (c) the Issuer delivers to the Trustee an Opinion of Counsel of recognized standing with respect to U.S. federal income tax matters to the effect that the deposit will not cause the beneficial owners of the Notes to recognize income, gain or loss for U.S. federal income tax purposes and the beneficial owners of the Notes will be subject to U.S. federal income tax on the same amounts, in the same manner and at the same times as if the deposit was not made; and
- (d) the Issuer delivers to the Trustee an Officer's Certificate and Opinion of Counsel stating that all conditions for the defeasance have been complied with.

In addition, if the conditions described in paragraphs (a) and (c) above are complied with, the Issuer and the Guarantor (if applicable) will be discharged from all of its obligations under the Notes (except for certain obligations to exchange or register the transfer of the Notes, replace stolen, lost or mutilated notes, maintain paying agents and pay Additional Amounts) ("**Legal Defeasance**") (a) if the Issuer delivers to the Trustee all the Notes for cancellation, together with an Opinion of Counsel and an Officer's Certificate stating that all conditions for the discharge have been complied with, and pays all other amounts payable under the Indenture, or (b) if all Notes not delivered to the Trustee for cancellation have become due and payable, will become due and payable within one year or are to be called for redemption within one year, and the Issuer has irrevocably deposited with the Trustee, in trust, money or U.S. Government Obligations (or a combination thereof) sufficient to pay the principal of, and interest on, the Notes when due, together with an Opinion of Counsel and an Officer's Certificate stating that all conditions for discharge have been complied with, and pays all other amounts payable under the Indenture, **provided that**, under the circumstances outlined in (a) or (b) above, the Opinion of Counsel described in paragraph (c) above also confirms that (x) the Issuer has received from, or there has been published by, the U.S. Internal Revenue Service a ruling or (y) since the Issue Date, there has been a change in the applicable U.S. federal income tax law, in either case to the effect that, and based thereon such Opinion of Counsel will confirm that, the beneficial owners of the Notes will not recognize income, gain or loss for U.S. federal income tax purposes as a result of such Legal Defeasance and will be subject to U.S. federal income tax on the same amounts, in the same manner and at the same times as would have been the case if such Legal Defeasance had not occurred.

"**U.S. Government Obligations**" means direct obligations (or certificates representing an ownership interest in such obligations) of the United States of America (including any agency or instrumentality thereof) for the payment of which the full faith and credit of the United States of America is pledged and which are not callable at the Issuer's option.

22. **Notices**

Notices to the Holders of Notes shall be sent to them (or the first named of joint holders) at their respective addresses on the Register. Any such notice shall be deemed to have been given on the fourth day after the date of sending.



*So long as the Notes are represented by a Global Note Certificate and such Global Note Certificate is held on behalf of Euroclear and/or Clearstream, DTC or any other clearing system, notices to the Holders of Notes of that Series may be given by delivery of the relevant notice to that clearing system for communication by it to entitled accountholders in substitution for publication as required by the Indenture.*

23. **Indemnification for Judgment Currency Fluctuations**

To the fullest extent permitted by law, the obligations of the Issuer and the Guarantor (if applicable) to any Noteholder under the Indenture, the Guarantee or the Notes, as the case may be, shall, notwithstanding any judgment in a currency (the "**Judgment Currency**") other the currency of the particular Series or Tranche of Notes (the "**Agreement Currency**"), be discharged only to the extent that on the day following receipt by such Noteholder or the Trustee, as the case may be, of any amount in the Judgment Currency, such Noteholder or the Trustee, as the case may be, may in accordance with normal banking procedures purchase the Agreement Currency with the Judgment Currency. If the amount of the Agreement Currency so purchased is less than the amount originally to be paid to such Noteholder or the Trustee, as the case may be, in the Agreement Currency, the Issuer and the Guarantor (if applicable) agree, as a separate obligation and notwithstanding such judgment, to pay the difference and if the amount of the Agreement Currency so purchased exceeds the amount originally to be paid to such Noteholder, such Noteholder or the Trustee, as the case may be, agrees to pay to or for the account of the Issuer or the Guarantor (if applicable), as the case may be, such excess; **provided that** such Noteholder or the Trustee, as the case may be, shall not have any obligation to pay any such excess as long as a Default has occurred and is continuing, in which case such excess may be applied by such Noteholder or the Trustee, as the case may be, to such obligations.

24. **Rounding**

For the purposes of any calculations referred to in these Conditions or the Indenture (unless otherwise specified in these Conditions or the relevant Pricing Supplement), (a) all percentages resulting from such calculations will be rounded, if necessary, to the nearest one hundred-thousandth of a percentage point (with 0.000005 per cent. being rounded up to 0.00001 per cent.), (b) all United States dollar amounts used in or resulting from such calculations will be rounded to the nearest cent (with one half cent being rounded up), (c) all Japanese Yen amounts used in or resulting from such calculations will be rounded downwards to the next lower whole Japanese Yen amount, and (d) all amounts denominated in any other currency used in or resulting from such calculations will be rounded to the nearest two decimal places in such currency, with 0.005 being rounded upwards.

25. **Governing Law; Consent to Jurisdiction and Waiver of Immunity**

- (a) The Indenture and the Notes shall be governed by, and construed in accordance with, the laws of the State of New York.
- (b) The Issuer and the Guarantor (if applicable) shall irrevocably submit to the non-exclusive jurisdiction of any New York state or United States federal court located in the Borough of Manhattan, The City of New York, New York (each a "**New York Court**") in any suit, action or proceeding arising out of or relating to the Indenture, the Notes or any transaction contemplated thereby, and will irrevocably waive, to the fullest extent permitted by applicable law, any objection to the venue of any such suit, action or proceeding in any such New York Court and any claim of any inconvenient forum. The Issuer and the Guarantor (if applicable) has appointed Corporation Service Company as agent for service of process with respect of any such suit, action or proceeding.
- (c) To the extent that the Issuer or the Guarantor (if applicable) has or hereafter may acquire any immunity (sovereign or otherwise) from any legal action, suit or proceeding, from jurisdiction of any court or from set-off or any legal process (including any immunity from non-exclusive jurisdiction or from service of process or from any execution to satisfy a final judgment or from attachment or in aid of such execution or otherwise) with respect to itself or any of its assets or properties, the Issuer and the Guarantor (if applicable) irrevocably waives, to the fullest extent permitted under applicable law, any such right or immunity or claim thereto which may now or hereafter exist, and agrees not to assert any such right or claim in any action or proceeding against it arising out of or based on the Notes or the Indenture.

26. **No Personal Liability of Directors, Officers, Employees and Stockholders**

No director, officer, employee, incorporator or stockholder of the Issuer or the Guarantor (if applicable) shall have any personal liability for any obligations of the Issuer or the Guarantor (if applicable) under the Notes, the Guarantee, the Indenture, or for any claim based on, in respect of, or by reason of, such obligations or their creation. Each Holder by accepting a Note waives and releases all such liability. The waiver and release are part of the consideration for issuance of the Notes. The waiver may not be effective to waive liabilities under federal securities laws.

## SUMMARY OF PROVISIONS RELATING TO THE NOTES WHILE IN GLOBAL FORM

### Clearing System Accountholders

In relation to any Series of Notes represented by one or more Global Note Certificates, references in the Conditions of the Notes to “Noteholder” are references to the person in whose name the relevant Global Note Certificate is for the time being registered in the Register which (a) in the case of a Restricted Global Note Certificate held by or on behalf of DTC will be Cede & Co. (or such other entity as is specified in the applicable Pricing Supplement) as nominee for DTC and (b) in the case of any Unrestricted Global Note Certificate which is held by or on behalf of a depository or a common depository for Euroclear and/or Clearstream and/or any other relevant clearing system, will be that depository or common depository or a nominee for that depository or common depository.

Each of the persons shown in the records of DTC, Euroclear, Clearstream and/or any other relevant clearing system as being entitled to an interest in a Global Note Certificate (each an “**Accountholder**”) must look solely to DTC, Euroclear, Clearstream and/or such other relevant clearing system (as the case may be) for such Accountholder’s share of each payment made by the relevant Issuer (failing which, in the case of Guaranteed Notes, the Guarantor) to the holder of such Global Note Certificate and in relation to all other rights arising under such Global Note Certificate. The extent to which, and the manner in which, Accountholders may exercise any rights arising under a Global Note Certificate will be determined by the respective rules and procedures of DTC, Euroclear and Clearstream and any other relevant clearing system from time to time. For so long as the relevant Notes are represented by a Global Note Certificate, Accountholders shall have no claim directly against the relevant Issuer or (in respect of each Series of Guaranteed Notes) the Guarantor in respect of payments due under the Notes and such obligations of the relevant Issuer or (in respect of each Series of Guaranteed Notes) the Guarantor will be discharged by payment to the holder of such Global Note Certificate.

### Transfers of Interests in Global Note Certificates

Transfers of interests in Global Note Certificates within DTC, Euroclear and Clearstream or any other relevant clearing system will be in accordance with their respective rules and operating procedures. None of the Issuers, the Guarantor, the Registrar, the Dealers or the Agents will have any responsibility or liability for any aspect of the records of any DTC, Euroclear and Clearstream or any other relevant clearing system or any of their respective participants relating to payments made on account of beneficial ownership interests in a Global Note Certificate or for maintaining, supervising or reviewing any of the records of DTC, Euroclear and Clearstream or any other relevant clearing system or the records of their respective participants relating to such beneficial ownership interests.

The laws of some states of the United States require that certain persons receive individual certificates in respect of their holdings of Notes. Consequently, the ability to transfer interests in a Global Note Certificate to such persons will be limited. Because clearing systems only act on behalf of participants, who in turn act on behalf of indirect participants, the ability of a person having an interest in a Global Note Certificate to pledge such interest to persons or entities which do not participate in the relevant clearing systems, or otherwise take actions in respect of such interest, may be affected by the lack of an Individual Note Certificate representing such interest.

Subject to compliance with the transfer restrictions applicable to the Notes described under “*Transfer Restrictions*,” transfers between DTC participants, on the one hand, and Euroclear or Clearstream accountholders, on the other will be effected by the relevant clearing systems in accordance with their respective rules and through action taken by the DTC Custodian, the Registrar and the Principal Paying Agent.

On or after the issue date for any Series, transfers of Notes of such Series between accountholders in Euroclear and/or Clearstream and transfers of Notes of such Series between participants in DTC will generally have a settlement date three business days after the trade date (T+3). The customary arrangements for delivery versus payment will apply to such transfers.

Transfers between DTC participants, on the one hand, and Euroclear or Clearstream accountholders, on the other will need to have an agreed settlement date between the parties to such transfer. Because there is no direct link between DTC, on the one hand, and Euroclear and Clearstream, on the other, transfers of interests in the relevant Global Note Certificates will be effected through the Principal Paying Agent, the DTC Custodian, the relevant Registrar and any applicable Transfer Agent receiving instructions (and where appropriate certification) from the transferor and arranging for delivery of the interests being transferred to the credit of the designated account for the transferee. Transfers will be effected on the later of (i) three business days after the trade date for

the disposal of the interest in the relevant Global Note Certificate resulting in such transfer and (ii) two business days after receipt by the Principal Paying Agent or the Registrar, as the case may be, of the necessary certification or information to effect such transfer. In the case of cross-market transfers, settlement between Euroclear or Clearstream accountholders and DTC participants cannot be made on a delivery versus payment basis. The securities will be delivered on a free delivery basis and arrangements for payment must be made separately. The customary arrangements for delivery versus payment between Euroclear and Clearstream accountholders or between DTC participants are not affected.

For a further description of restrictions on the transfer of Notes, see “*Subscription and Sale*” and “*Transfer Restrictions*.”

Upon the issue of a Restricted Global Note Certificate to be held by or on behalf of DTC, DTC or the DTC Custodian will credit the respective nominal amounts of the individual beneficial interests represented by such Global Note Certificate to the account of DTC participants. Ownership of beneficial interests in such Global Note Certificate will be held through participants of DTC, including the respective depositaries of Euroclear and Clearstream. Ownership of beneficial interests in such Global Note Certificate will be shown on, and the transfer of such ownership will be effected only through, records maintained by DTC or its nominee. DTC has advised the Issuers that it will take any action permitted to be taken by a holder of the Notes represented by a Global Note Certificate held by or on behalf of DTC (including, without limitation, the presentation of such Global Note Certificates for exchange as described above) only at the direction of one or more participants in whose account with DTC interests in such Global Note Certificate are credited, and only in respect of such portion of the aggregate nominal amount of such Global Note Certificate as to which such participant or participants has or have given such direction. However, in certain circumstances, DTC will exchange the relevant Global Note Certificate for Individual Note Certificates (which will bear the relevant legends set out in “*Transfer Restrictions*”).

Although DTC, Euroclear and Clearstream have agreed to the foregoing procedures in order to facilitate transfers of interests in the Global Note Certificates among participants and account holders of DTC, Euroclear and Clearstream, they are under no obligation to perform or continue to perform such procedures, and such procedures may be discontinued at any time. None of the Issuers, the Guarantor, the Registrar, the Dealers, the Trustee or the Agents will have any responsibility for the performance by DTC, Euroclear or Clearstream or their respective direct or indirect participants or account holders of their respective obligations under the rules and procedures governing their respective operations.

While a Global Note Certificate is lodged with DTC, Euroclear, Clearstream or any relevant clearing system, Individual Note Certificates for the relevant Series of Notes will not be eligible for clearing and settlement through such clearing systems.

### **Conditions applicable to Global Note Certificates**

Each Global Note Certificate will contain provisions which modify the Conditions of the Notes as they apply to the Global Note Certificate. The following is a summary of certain of those provisions:

*Payments:* All payments in respect of the Global Note Certificate which, according to the Conditions of the Notes, require presentation and/or surrender of a Note or Global Note Certificate will be made against presentation and (in the case of payment of principal in full with all interest accrued thereon) surrender of the Global Note Certificate to or to the order of any Paying Agent and will be effective to satisfy and discharge the corresponding liabilities of the relevant Issuer (failing which, in the case of Guaranteed Notes, the Guarantor) in respect of the Notes. On each occasion on which a payment of principal or interest is made in respect of the Global Note Certificate, the relevant Issuer shall procure that the payment is noted in a schedule thereto.

*Payment Business Day:* in the case of a Global Note Certificate, shall be: if the currency of payment is euro, any day which is a TARGET Settlement Day and a day on which dealings in foreign currencies may be carried on in each (if any) Additional Financial Centre; or, if the currency of payment is not euro, any day which is a day on which dealings in foreign currencies may be carried on in the Principal Financial Centre of the currency of payment and in each (if any) Additional Financial Centre.

*Payment Record Date:* Each payment in respect of a Global Note Certificate will be made to the person shown as the Holder in the Register at the close of business (in the relevant clearing system) on the Clearing System Business Day before the due date for such payment (the “**Record Date**”) where “Clearing System Business Day” means a day on which each clearing system for which the Global Note Certificate is being held is open for business.

*Partial exercise of call option:* In connection with an exercise of the option contained in Condition 10(c) (*Redemption and Purchase—Optional Redemption*) in relation to some only of the Notes or Global Note Certificate may be redeemed in part in the principal amount specified by the relevant Issuer in accordance with the Conditions and the Notes to be redeemed will not be selected as provided in the Conditions but in accordance with the rules and procedures of DTC, Euroclear and/or Clearstream (to be reflected in the records of DTC, Euroclear and/or Clearstream as either a pool factor or a reduction in principal amount, at their discretion).

*Notices:* Notwithstanding Condition 22 (*Notices*), while all the Notes are represented by a Global Note Certificate and the Global Note Certificate is registered in the name of DTC's nominee or deposited with a depository or a common depository for Euroclear and/or Clearstream and/or any other relevant clearing system, notices to Noteholders may be given by delivery of the relevant notice to DTC and/or Euroclear and/or Clearstream and/or any other relevant clearing system and, in any case, such notices shall be deemed to have been given to the Noteholders in accordance with Condition 22 (*Notices*) on the date of delivery to DTC and/or Euroclear and/or Clearstream and/or any other relevant clearing system.

## FORM OF PRICING SUPPLEMENT

The Pricing Supplement in respect of each Series of Notes will be substantially in the following form, duly supplemented (if necessary), amended (if necessary) and completed to reflect the particular terms of the relevant Notes and their issue.

**MiFID II product governance / target market – [appropriate target market legend to be included]**

**Option 1: Legend for issuances involving one or more MiFID Firm manufacturers**

**[MiFID II product governance / Professional investors and ECPs only target market – Solely for the purposes of [the/each] manufacturer’s product approval process, the target market assessment in respect of the Notes has led to the conclusion that: (i) the target market for the Notes is eligible counterparties and professional clients only, each as defined in [Directive 2014/65/EU (as amended, “MiFID II”)] [MiFID II]; and (ii) all channels for distribution of the Notes to eligible counterparties and professional clients are appropriate. Any person subsequently offering, selling or recommending the Notes (a “distributor”) should take into consideration the manufacturer[‘s/s’] target market assessment; however, a distributor subject to MiFID II is responsible for undertaking its own target market assessment in respect of the Notes (by either adopting or refining the manufacturer[‘s/s’] target market assessment) and determining appropriate distribution channels.]**

**Option 2: Legend for issuances where there is a sole manager that is a MiFID Firm manufacturer (i.e. no syndicate) (and assuming that none of the Issuer, the Guarantor or other credit provider is a MiFID regulated entity)**

**[MiFID II product governance / Professional investors and ECPs only target market – Solely for the purposes of the manufacturer’s product approval process, the target market assessment in respect of the Notes has led to the conclusion that: (i) the target market for the Notes is eligible counterparties and professional clients only, each as defined in [Directive 2014/65/EU (as amended, “MiFID II”)] [MiFID II]; and (ii) all channels for distribution of the Notes to eligible counterparties and professional clients are appropriate. Any person subsequently offering, selling or recommending the Notes (a “distributor”) should take into consideration the manufacturer’s target market assessment; however, a distributor subject to MiFID II is responsible for undertaking its own target market assessment in respect of the Notes (by either adopting or refining the manufacturer’s target market assessment) and determining appropriate distribution channels.]**

**UK MiFIR product governance / target market – [appropriate target market legend to be included]**

**Option 1: Legend for issuances involving one or more UK MiFIR Firm manufacturers**

**[UK MiFIR product governance / Professional investors and ECPs only target market – Solely for the purposes of [the/each] manufacturer’s product approval process, the target market assessment in respect of the Notes has led to the conclusion that: (i) the target market for the Notes is eligible counterparties, as defined in the FCA Handbook Conduct of Business Sourcebook (“COBS”), and professional clients, as defined in Regulation (EU) No 600/2014 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018 (“UK MiFIR”) only; and (ii) all channels for distribution of the Notes to eligible counterparties and professional clients are appropriate. Any person subsequently offering, selling or recommending the Notes (a “distributor”) should take into consideration the manufacturer[‘s/s’] target market assessment; however, a distributor subject to the FCA Handbook Product Intervention and Product Governance Sourcebook (the “UK MiFIR Product Governance Rules”) is responsible for undertaking its own target market assessment in respect of the Notes (by either adopting or refining the manufacturer[‘s/s’] target market assessment) and determining appropriate distribution channels.]**

**Option 2: Legend for issuances where there is a sole manager that is a UK MiFIR Firm manufacturer (i.e. no syndicate) (and assuming that none of the Issuer, the Guarantor or other credit provider is a UK MiFIR regulated entity)**

**[UK MiFIR product governance / Professional investors and ECPs only target market – Solely for the purposes of the manufacturer’s product approval process, the target market assessment in respect of the Notes has led to the conclusion that: (i) the target market for the Notes is eligible counterparties, as defined in the FCA Handbook Conduct of Business Sourcebook (“COBS”), and professional clients, as defined in Regulation (EU) No 600/2014 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018 (“UK MiFIR”) only; and (ii) all channels for distribution of the Notes to eligible counterparties and professional clients**

are appropriate. Any person subsequently offering, selling or recommending the Notes (a “**distributor**”) should take into consideration the manufacturer’s target market assessment; however, a distributor subject to the FCA Handbook Product Intervention and Product Governance Sourcebook (the “**UK MiFIR Product Governance Rules**”) is responsible for undertaking its own target market assessment in respect of the Notes (by either adopting or refining the manufacturer’s target market assessment) and determining appropriate distribution channels.]

**[PROHIBITION OF SALES TO EEA RETAIL INVESTORS** – The Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the European Economic Area (the “**EEA**”). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client as defined in point (11) of Article 4(1) of MiFID II; or (ii) a customer within the meaning of Directive (EU) 2016/97 (the “**Insurance Distribution Directive**”), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (iii) not a qualified investor as defined in Regulation (EU) 2017/1129 (the “**Prospectus Regulation**”). Consequently, no key information document required by Regulation (EU) No 1286/2014 (as amended, the “**PRIIPs Regulation**”) for offering or selling the Notes or otherwise making them available to retail investors in the EEA has been prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.]

**[PROHIBITION OF SALES TO UK RETAIL INVESTORS** – The Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the United Kingdom (“**UK**”). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client, as defined in point (8) of Article 2 of Regulation (EU) No 2017/565 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018 (“**EUWA**”); (ii) a customer within the meaning of the provisions of the Financial Services and Markets Act 2000 (the “**FSMA**”) and any rules or regulations made under the FSMA to implement Directive (EU) 2016/97, where that customer would not qualify as a professional client, as defined in point (8) of Article 2(1) of Regulation (EU) No 600/2014 as it forms part of domestic law by virtue of the EUWA; or (iii) not a qualified investor as defined in Article 2 of Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA. Consequently no key information document required by Regulation (EU) No 1286/2014 as it forms part of domestic law by virtue of the EUWA (the “**UK PRIIPs Regulation**”) for offering or selling the Notes or otherwise making them available to retail investors in the UK has been prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the UK may be unlawful under the UK PRIIPs Regulation.]

**[Singapore Securities and Futures Act Product Classification** – Solely for the purposes of its obligations pursuant to sections 309B(1)(a) and 309B(1)(c) of the Securities and Futures Act (Chapter 289 of Singapore) (the “**SFA**”), the Issuer has determined, and hereby notifies all relevant persons (as defined in Section 309A of the SFA) that the Notes are [prescribed capital markets products (as defined in the Securities and Futures (Capital Markets Products) Regulations 2018) and [Excluded Investment Products (as defined in MAS Notice SFA 04-N12: Notice on the Sale of Investment Products and MAS Notice FAA-N16: Notice on Recommendations on Investment Products)]]/[capital markets products other than prescribed capital markets products (as defined in the Securities and Futures (Capital Markets Products) Regulations 2018) and Specified Investment Products (as defined in MAS Notice SFA 04-N12: Notice on the Sale of Investment Products and MAS Notice FAA-N16: Notice on Recommendations on Investment Products)].

**[The following language applies if the Notes are intended to be Qualifying Debt Securities for the purposes of the Income Tax Act, Chapter 134 of Singapore** – Where interest, discount income, prepayment fee, redemption premium or break cost is derived from any of the Notes by any person who is not resident in Singapore and who carries on any operations in Singapore through a permanent establishment in Singapore, the tax exemption available for qualifying debt securities (subject to certain conditions) under the Income Tax Act, Chapter 134 of Singapore (the “**ITA**”), shall not apply if such person acquires such Notes using the funds and profits of such person’s operations through a permanent establishment in Singapore. Any person whose interest, discount income, prepayment fee, redemption premium or break cost derived from the Notes is not exempt from tax (including for the reasons described above) shall include such income in a return of income made under the ITA.]

**Pricing Supplement dated [●]**

**[PTT Global Chemical Public Company Limited] [GC Treasury Center Company Limited]**

**Issue of [Aggregate Nominal Amount of Series] [Guaranteed] [Title of Notes] [Guaranteed by PTT Global Chemical Public Company Limited subject to the Maximum Guaranteed Amount] under the US\$[●] Global Medium Term Note Program**

The document constitutes the Pricing Supplement relating to the issue of Notes described herein.

Terms used herein shall be deemed to be defined as such for the purposes of the Conditions (the “**Conditions**”) set forth in the Offering Memorandum dated [●], 20[●]. This Pricing Supplement contains the final terms of the Notes and must be read in conjunction with such Offering Memorandum [and the supplemental Offering Memorandum dated *[date]*].

[Include whichever of the following apply or specify as “Not Applicable” (N/A). Note that the numbering should remain as set out below, even if “Not Applicable” is indicated for individual paragraphs or sub-paragraphs. Italics denote guidance for completing the Pricing Supplement.]

1. Issuer: [PTT Global Chemical Public Company Limited.] / [GC Treasury Center Company Limited]
2. Guarantor: [PTT Global Chemical Public Company Limited] / [Not Applicable]<sup>1</sup>
3. [(i) Series Number:] [●]  
[(ii) Tranche Number:] [●]  
*(If fungible with an existing Series, details of that Series, including the date on which the Notes become fungible).]*
4. Specified Currency or Currencies: [●]  
*(If Notes are being cleared through DTC with interest and or principal payable in a currency other than U.S. dollars, check whether DTC will accept payments in such currency)*
5. Aggregate Nominal Amount: [●]  
[(i) [Series]:] [●]  
[(ii) Tranche:] [●]  
(i) Issue Price: [●]% of the Aggregate Nominal Amount [plus accrued interest from *[insert date]* (in the case of fungible issues only, if applicable)]  
(ii) Net Proceeds [●] [(Required only for listed issues)]

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<sup>1</sup> Guarantor to be included for every Series of Notes where GC Treasury Center Company Limited is Issuer.



6. (i) Specified Denominations<sup>2,3,4</sup>: [●]  
(ii) Calculation Amount: [●]
7. (i) Issue Date: [●]  
(ii) Interest Commencement Date: [*Specify/Issue Date/Not Applicable*]
8. Maturity Date: [*Specify date or (for Floating Rate Notes) Interest Payment Date falling in or nearest to the relevant month and year*]<sup>5</sup>  
[*If the Maturity Date is less than one year from the Issue Date and either (a) the issue proceeds are received by the Issuer in the United Kingdom, or (b) the activity of issuing the Notes is carried on from an establishment maintained by the Issuer in the United Kingdom, (i) the Notes must have a minimum redemption value of £100,000 (or its equivalent in other currencies) and be sold only to “professional investors” or (ii) another applicable exemption from section 19 of the FSMA must be available.*]
9. Interest Basis: [[●]% Fixed Rate]  
[[*Specify reference rate*] +/- [●]% Floating Rate]  
[Zero Coupon]  
[Index Linked Interest]  
[Other (*Specify*)]  
(further particulars specified below)
10. Redemption/Payment Basis: [Redemption at par]  
[Index Linked Redemption]  
[Dual Currency]  
[Partly Paid]  
[Installment]  
[Other (*Specify*)]
11. Change of Interest or Redemption/  
Payment Basis: [*Specify details of any provision for convertibility of Notes into another interest or redemption/payment basis*]
12. Call Options:  
[Issuer Call]  
[(further particulars specified below)]

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<sup>2</sup> Notes (including Notes denominated in sterling) in respect of which the issue proceeds are to be accepted by the Issuer in the United Kingdom or whose issue otherwise constitutes a contravention of section 19 of the FSMA and which have a maturity of less than one year and must have a minimum redemption value of £100,000 (or its equivalent in other currencies).

<sup>3</sup> If the specified denomination is expressed to be €100,000 or its equivalent and multiples of a lower principal amount (for example €1,000), insert the additional wording as follows: €100,000 and integral multiples of [€1,000] in excess thereof up to and including [€9,000]/[€199,000]. No notes in definitive form will be issued with a denomination above [€9,000]/[€199,000].

<sup>4</sup> Notes to be listed on the Singapore Exchange Securities Trading Limited (the “SGX-ST”) are required to be traded in a minimum board lot size of at least S\$200,000 (or its equivalent in other countries)

<sup>5</sup> Note that for Renminbi or Hong Kong dollar denominated Fixed Rate Notes where Interest Payment Dates are subject to modification it will be necessary to use the second option here.

13. Listing: [Singapore Exchange Securities Trading Limited/Other (specify)/None]
14. Method of distribution: [Syndicated/Non-syndicated]

**PROVISIONS RELATING TO INTEREST (IF ANY) PAYABLE**

15. **Fixed Rate Note Provisions** [Applicable/Not Applicable]  
*(If not applicable, delete the remaining sub- paragraphs of this paragraph)*
- (i) Rate[(s)] of Interest: [●]% per annum [payable [annually/semi-annually/quarterly/monthly/ other (specify)] in arrear]
- (ii) Interest Payment Date(s): [●] in each year [adjusted in accordance with [specify Business Day Convention and any applicable Business Centre(s) for the definition of “Business Day”]/not adjusted]
- (iii) Fixed Coupon Amount[(s)]: [●] per Calculation Amount<sup>6</sup>
- (iv) Broken Amount(s): [●] per Calculation Amount, payable on the Interest Payment Date falling [in/on] [●]
- (v) Day Count Fraction: [30/360/Actual/Actual (ICMA/ISDA)// other]
- (vi) Other terms relating to the method of calculating interest for Fixed Rate Notes: [Not Applicable/give details]
16. **Floating Rate Note Provisions** [Applicable/Not Applicable]  
*(If not applicable, delete the remaining sub-paragraphs of this paragraph)*
- (i) Interest Period(s): [●]
- (ii) Specified Period: [●]  
*(Specified Period and Specified Interest Payment Dates are alternatives. A Specified Period, rather than Specified Interest Payment Dates, will only be relevant if the Business Day Convention is the FRN Convention, Floating Rate Convention or Eurodollar Convention. Otherwise, insert “Not Applicable”)*
- (iii) Specified Interest Payment Dates: [●]  
*(Specified Period and Specified Interest Payment Dates are alternatives. If the Business Day Convention is the FRN Convention, Floating Rate Convention or Eurodollar Convention, insert “Not Applicable”)*
- (iv) First Interest Payment Date: [●]
- (v) Business Day Convention: [Floating Rate Convention/Following Business Day Convention/Modified Following Business Day Convention/Preceding Business Day Convention/other (give details)]
- (vi) Additional Business Centre(s): [Not Applicable/give details]

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<sup>5</sup> For Renminbi or Hong Kong dollar denominated Fixed Rate Notes where the Interest Payment Dates are subject to modification the following alternative wording is appropriate: “Each Fixed Coupon Amount shall be calculated by multiplying the product of the Rate of Interest and the Calculation Amount by the Day Count Fraction and rounding the resultant figure to the nearest RMB0.01, RMB0.005 for the case of Renminbi-denominated Fixed Rate Notes and to the nearest HK\$0.01, HK\$0.005 for the case of Hong Kong dollar denominated Fixed Rate Notes, being rounded upwards.

- (vii) Manner in which the Rate(s) of Interest is/are to be determined: [Screen Rate Determination/ISDA Determination/other (give details)]
- (viii) Party responsible for calculating the Rate(s) of Interest and/or Interest Amount(s) (if not the [Principal Paying Agent]): [[Name] shall be the Calculation Agent (no need to specify if the Principal Paying Agent is to perform this function)]
- (ix) Screen Rate Determination:  
Reference Bank: [●]  
Reference Rate: [For example, LIBOR or EURIBOR]  
Interest Determination Date(s): [●]  
Relevant Screen Page: [For example, Reuters LIBOR 01/EURIBOR 01]  
Relevant Time: [For example, 11.00 a.m. London time/Brussels time]  
Relevant Financial Centre: [For example, London/Euro-zone (where Euro-zone means the region comprised of the countries whose lawful currency is the euro)]
- (x) ISDA Determination:  
Floating Rate Option: [●]  
Designated Maturity: [●]  
Reset Date: [●]
- (xi) Margin(s): [+/-][●]% per annum
- (xii) Minimum Rate of Interest: [●]% per annum
- (xiii) Maximum Rate of Interest: [●]% per annum
- (xiv) Linear Interpolation: [Applicable/Not Applicable]
- (xv) Day Count Fraction: [●]
- (xvi) Fall back provisions, rounding provisions, denominator and any other terms relating to the method of calculating interest on Floating Rate Notes, if different from those set out in the Conditions: [●]
17. **Zero Coupon Note Provisions** [Applicable/Not Applicable]  
*(If not applicable, delete the remaining sub-paragraphs of this paragraph)*
- (i) Accrual Yield: [●]% per annum
- (ii) Reference Price: [●]
- (iii) Any other formula/basis of determining amount payable: [●]
18. **Index-Linked Interest Note/other variable-linked interest Note Provisions** [Applicable/Not Applicable]  
*(If not applicable, delete the remaining sub-paragraphs of this paragraph)*
- (i) Index/Formula/other variable: [give or annex details]
- (ii) Calculation Agent responsible for calculating the interest due: [●]
- (iii) Provisions for determining Coupon where calculated by reference to Index and/or Formula and/or other variable: [●]
- (iv) Interest Determination Date(s): [●]

- (v) Provisions for determining Coupon where calculation by reference to Index and/or Formula and/or other variable is impossible or impracticable or otherwise disrupted: [●]
- (vi) Interest or calculation period(s): [●]
- (vii) Specified Period: [●]  
*(Specified Period and Specified Interest Payment Dates are alternatives. A Specified Period, rather than Specified Interest Payment Dates, will only be relevant if the Business Day Convention is the FRN Convention, Floating Rate Convention or Eurodollar Convention. Otherwise, insert "Not Applicable")*
- (viii) Specified Interest Payment Dates: [●]  
*(Specified Period and Specified Interest Payment Dates are alternatives. If the Business Day Convention is the FRN Convention, Floating Rate Convention or Eurodollar Convention, insert "Not Applicable")*
- (ix) Business Day Convention: [Floating Rate Convention/Following Business Day Convention/Modified Following Business Day Convention/Preceding Business Day Convention/other (give details)]
- (x) Additional Business Centre(s): [●]
- (xi) Minimum Rate/Amount of Interest: [●]% per annum
- (xii) Maximum Rate/Amount of Interest: [●]% per annum
- (xiii) Day Count Fraction: [●]
19. **Dual Currency Note Provisions** [Applicable/Not Applicable]  
*(If not applicable, delete the remaining sub-paragraphs of this paragraph)*
- (i) Rate of Exchange/method of calculating Rate of Exchange: [give details]
- (ii) Calculation Agent, if any, responsible for calculating the principal and/or interest due: [●]
- (iii) Provisions applicable where calculation by reference to Rate of Exchange impossible or impracticable: [●]
- (iv) Person at whose option Specified Currency(ies) is/are payable: [●]

**PROVISIONS RELATING TO REDEMPTION**

20. **Call Option** [Applicable/Not Applicable]  
*(If not applicable, delete the remaining sub-paragraphs of this paragraph)*
- (i) Optional Redemption Date(s) (Call): [●]
- (ii) Optional Redemption Amount(s) (Call) of each Note and method, if any, of calculation of such amount(s): [●] per Calculation Amount

- (iii) If redeemable in part:
  - (a) Minimum Redemption Amount: [●] per Calculation Amount
  - (b) Maximum Redemption Amount [●] per Calculation Amount
- (iv) Notice period: [●]
- 21. **Put Option** [Applicable/Not Applicable]  
*(If not applicable, delete the remaining sub-paragraphs of this paragraph)*
- (i) Optional Redemption Date(s) (Put): [●]
- (ii) Optional Redemption Amount(s) (Put) of each Note and method, if any, of calculation of such amount(s): [●] per Calculation Amount
- (iii) Notice period: [●]
- 22. **Final Redemption Amount of each Note** [●] per Calculation Amount  
In cases where the Final Redemption Amount is Index-Linked or other variable-linked:
  - (i) Index/Formula/variable: [*give or annex details*]
  - (ii) Calculation Agent responsible for calculating the Final Redemption Amount: [●]
  - (iii) Provisions for determining Final Redemption Amount where calculated by reference to Index and/or Formula and/or other variable: [●]
  - (iv) Date for determining Final Redemption Amount where calculation by reference to Index and/or Formula and/or other variable: [●]
  - (v) Provisions for determining Final Redemption Amount where calculation by reference to Index and/or Formula and/or other variable is impossible or impracticable or otherwise disrupted: [●]
  - (vi) [Payment Date]: [●]
  - (vii) Minimum Final Redemption Amount: [●] per Calculation Amount
  - (viii) Maximum Final Redemption Amount: [●] per Calculation Amount
- 23. **Early Redemption Amount** [Not Applicable]  
Early Redemption Amount(s) per Calculation Amount payable on redemption for taxation reasons, on change of control or on event of default or other early redemption and/or the method of calculating the same (if required or if different from that set out in the Conditions): [*If each of the Early Redemption Amount (Tax) and the Early Termination Amount are the principal amount of the Notes/specify the Early Redemption Amount (Tax) and/or the Early Termination Amount if different from the principal amount of the Notes)*]

**GENERAL PROVISIONS APPLICABLE TO THE NOTES**

- 24. **Form of Notes:** [Unrestricted Global Certificate exchangeable for unrestricted Individual Note Certificates on [●] days' notice in

		the limited circumstances described in the Unrestricted Global Certificate] <sup>7</sup> [and] [Restricted Global Certificate exchangeable for Restricted Individual Note Certificates on [●] days' notice in the limited circumstances described in the Restricted Global Certificate] <sup>8</sup>
25.	Additional Financial Centre(s) or other special provisions relating to payment dates:	[Not Applicable/give details.]  <i>Note that this paragraph relates to the date and place of payment, and not interest period end dates, to which sub paragraphs 16(vi) and 18(x) relate</i>
26.	Details relating to Partly Paid Notes: amount of each payment comprising the Issue Price and date on which each payment is to be made [and consequences (if any) of failure to pay, including any right of the Issuer to forfeit the Notes and interest due on late payment]:	[Not Applicable/give details]
27.	Details relating to Installment Notes: amount of each installment, date on which each payment is to be made:	[Not Applicable/give details]
28.	Redenomination, renominialization and reconventioning provisions:	[Not Applicable/The provisions annexed to this Pricing Supplement apply]
29.	Consolidation provisions:	The provisions in Condition [20] ( <i>Further Issues</i> ) [annexed to this Pricing Supplement] apply]
30.	Any applicable currency disruption/ fallback provisions:	[Not Applicable/give details]
31.	Maximum Guaranteed Amount	[Not Applicable/as further described in the Offering Memorandum]
32.	Other terms or special conditions:	[Not Applicable/give details]
<b>DISTRIBUTION</b>		
33.	(i) If syndicated, names of Managers:	[Not Applicable/give names]
	(ii) Stabilizing Manager(s) (if any):	[Not Applicable/give name]
34.	If non-syndicated, name and address of Dealer:	[Not Applicable/give name and address]
35.	Total commission and concession:	[●]% of the Aggregate Nominal Amount
36.	U.S. Selling Restrictions:	[Reg. S Category [1/2]]/[Rule 144A];  [Rule 144A Eligible/Not Rule 144A Eligible]
37.	Additional selling restrictions:	[Not Applicable/give details]
38.	Prohibition of Sales to EEA Retail Investors:	[Applicable/Not Applicable]

<sup>7</sup> If the Specified Denominations of the Notes in paragraph 6 includes language substantially to the following effect: “[€50,000]/[€100,000] and integral multiples of [€1,000] in excess thereof up to and including [€99,000]/[€199,000],” the Unrestricted Global Certificate shall not be exchangeable on [●] days’ notice or at any time.

<sup>8</sup> If the Specified Denominations of the Notes in paragraph 6 includes language substantially to the following effect: “[€50,000]/[€100,000] and integral multiples of [€1,000] in excess thereof up to and including [€99,000]/[€199,000],” the Restricted Global Certificate shall not be exchangeable on [●] days’ notice or at any time.

*(If the Notes clearly do not constitute “packaged” products, “Not Applicable” should be specified. If the offer of the Notes may constitute “packaged” products and no KID will be prepared, “Applicable” should be specified.)*

39. Prohibition of Sales to UK Retail Investors

[Applicable/Not Applicable]

*(If the Notes clearly do not constitute “packaged” products, “Not Applicable” should be specified. If the offer of the Notes may constitute “packaged” products and no KID will be prepared, “Applicable” should be specified.)*

#### OPERATIONAL INFORMATION

40. ISIN Code: [●]
41. Common Code: [●]
42. [FISN: [●]]
43. [CFI Code: [●]]
44. CUSIP: [●]
45. Any clearing system(s) other than Euroclear/Clearstream, DTC Service and the relevant identification number(s): [Not Applicable/give name(s) and number(s)]
46. Delivery: Delivery [against/free of] payment
47. Additional Paying Agent(s) (if any): [●]

#### GENERAL

48. The aggregate principal amount of Notes issued has been translated into United States dollars at the rate of [●], producing a sum of (for Notes not denominated in United States dollars): [Not Applicable/US\$]
49. [Ratings: The Notes to be issued have been rated:  
[[●]: [●]];  
[[●]: [●]]; [and]  
(each a “**Rating Agency**”).  
If any Rating Agency shall not make a rating of the Notes publicly available, the Issuer shall select and substitute them with [●] or [●] and its successors.]

#### [USE OF PROCEEDS

Give details if different from the “Use of Proceeds” section in the Offering Memorandum.]

#### STABILIZING

In connection with the issue of the Notes, [*name(s) of Stabilizing Manager(s)*] (or persons acting on behalf of [*name(s) of Stabilizing Manager(s)*]) (the “**Stabilizing Manager[s]**”) may over-allot Notes or effect transactions with a view to supporting the price of the Notes at a level higher than that which might otherwise prevail for a limited period after the Issue Date. However, there is no obligation on such Stabilizing Manager[s] to do this. Such stabilizing, if commenced, may be discontinued at any time, and must be brought to an end after a limited period. Such stabilizing shall be in compliance with all applicable laws, regulations and rules.

#### PURPOSE OF PRICING SUPPLEMENT

This Pricing Supplement comprises the final terms required for issue [and admission to trading on the SGX-ST] of the Notes described herein pursuant to the US\$[●] Guaranteed Global Medium Term Note Program of the Issuer [and the Guarantor].

**RESPONSIBILITY**

The Issuer accepts responsibility for the information contained in this Pricing Supplement.

Signed on behalf of [PTT Global Chemical Public Company Limited] [GC Treasury Center Company Limited]

By: .....

Name: .....

Title: .....



## CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

The following is a summary of certain of our material related party transactions during the year ended December 31, 2020. For the purposes herein, parties are considered to be related parties if we have the ability, directly or indirectly, to control or jointly control the party or exercise significant influence over the party in making financial and operating decisions, or vice versa, or where we and the party are subject to common control or common significant influence. Related parties may be individuals or other entities. We believe each of these arrangements as described below have been entered into on arm's length terms or on terms that have been at least as favorable to us as similar transactions with non-related parties. For further information about our related party transactions, please see note 28 to our consolidated financial statements for the year ended December 31, 2020 for more information.

### Transactions

The table below sets forth the amounts involved in our related party transactions for the period indicated by type of transaction:

	<b>For the year ended December 31, 2020</b>	
	(in millions of)	
	THB	US\$
Sale of goods or rendering of services.....	156,179.7	5,204.3
Purchases of goods or receiving of services .....	200,169.0	6,670.1
Long-term loans to related parties <sup>(1)</sup> .....	714.1	23.8
Transactions with key management personnel .....	294.2	9.8
Others <sup>(2)</sup> .....	2,932.4	97.7
<b>Total</b> .....	<b>360,289.4</b>	<b>12,005.6</b>

*Notes:*

(1) Long-term loans refer to loans with a term of 12 months or more.

(2) See "— Others" below. Includes other income, interest income, interest expense, dividend income, net derivative gain, expense capitalized to fixed assets and other expense.

### **Purchases of Goods and Receiving of Services**

We have entered into long-term agreements with PTT and other related parties for the purchases of feedstock, including crude oil, natural gas, ethane, propane, LPG and other raw materials. Pricing terms are generally determined based on the prevailing prices in the market or with reference to other benchmark prices. These feedstock agreements range from ten to 20 years and are renewable.

Pursuant to utilities, shared services agreements and other services agreements, our subsidiaries and other related parties have provided us with amenities, such as chemical storage, transportation facilities, pipeline, information technology, outsourcing, security and marketing as well as utilities including steam and water. These related parties include Thai Tank Terminal, GPSC, PTT Digital Solutions, PTT Energy Solutions, Global Green Chemicals , GC Maintenance and Engineering, NPC Safety and Environmental Service, NPC S&E Security Guard, GC Logistics Solutions and PL Global Transport. The utilities, shared services agreements and services agreements range from one year to 25 years. The duration of these contracts may generally be extended upon agreements by both parties.

### **Sales of Goods and Rendering of Services**

We have entered into offtake agreements with related parties for the sale of our products, such as refinery products, ethylene, propylene, benzene, hydrogen and tail gas. We also supply power to certain related parties. These related parties include IRPC and Thai Oil Prices are generally determined based on the prevailing prices in the market and other benchmark prices. These agreements range from one to 21 years and are generally renewable for one or more years or on an evergreen basis. See "*Business—Our Business Units and Products*" for more information.

### **Long-Term Loans to Related Parties**

We have secured and unsecured long-term lending agreements with related parties, amounting to US\$24.9 million. The loans bear interest based on the prevailing market rate referenced to LIBOR plus an interest rate spread. The total outstanding amount under the facilities was US\$23.8 million as of December 31, 2020.

### ***Transactions with Key Management Personnel***

Our transactions with key management personnel consist of personnel compensation items, such as remuneration, short-term employee benefits and post-employment and other long-term benefits. For more information about the compensation of key management personnel, please see “*Management—Share Ownership and Compensation.*”

### ***Others***

We have entered into crack spread swap agreements with PTT to hedge our oil refinery margin. Under the agreements, the floating amount of the basket refinery margin is swapped for a fixed amount of the basket refinery margin for a specified quantity each month.

We have also entered into crude oil and feedstock time spread agreements with PTT to control our price risk. The time spread is based on the difference between the average price of crude oil and feedstock for the current month and the price for the following month.

We also have entered into rental agreements with related parties office space, the lease of land to operate jetty and buffer tank farm services and various other land lease agreements. These agreements range from three years to 30 years.

### **Accounts Balances**

The balances due to and from our related parties as of December 31, 2020 are as follows:

<b>Accounts</b>	<b>As of December 31, 2020</b>	
	<b>(in millions of)</b>	
	<b>THB</b>	<b>US\$</b>
Trade accounts receivable .....	11,149.9	371.5
Derivatives - current assets .....	17.8	0.6
Other receivables .....	1,679.7	56.0
Trade accounts payable .....	14,884.6	496.0
Derivatives - current liabilities .....	2.6	0.1
Lease liabilities .....	499.1	16.6
Other payables <sup>(1)</sup> .....	552.4	18.4

*Note:*

(1) *Includes other payables to related parties and contractor-related parties. Contractor-related parties are PTT Digital, GPSC, Dhipaya Insurance Plc and Business Services Alliance Co., Ltd.*

## DESCRIPTION OF OTHER MATERIAL INDEBTEDNESS

To finance working capital requirements and to fund investment projects, we have entered into financing arrangements with various financial institutions. In addition, we issue bonds from time to time which are offered to institutional investors and/or the public. As of December 31, 2020, our total outstanding borrowings, including bonds issued and excluding lease liabilities, totaled THB148,296.4 million (US\$4,941.6 million), of which THB21,377.4 million (US\$712.3 million) were secured. We set forth below a summary of the material terms and conditions of these loans, bonds and other material indebtedness. For further information about our material indebtedness, please see note 20 to our financial statements for the year ended December 31, 2020 included elsewhere in this Offering Memorandum.

### **Bank Loans**

We have entered into loan agreements with various banks and financial institutions. These loans are typically unsecured loans to finance our investment projects and working capital and to refinance our loans and other indebtedness. Our loans typically have terms of up to 10 years from their respective signing date.

As of December 31, 2020, the aggregate outstanding amount under these loans totaled THB62,970.4 million (US\$2,098.3 million), of which THB19.0 million (US\$0.6 million) consisted of short-term obligations. Out of the long-term obligations of THB62,951.4 million (US\$2,097.7 million), THB1,974.4 million (US\$65.8 million) was due within one year and THB60,977.0 million (US\$2,031.9 million) would be due in more than one year.

### *Interest*

The principal amounts outstanding under the bank loans bear fixed interest rates and floating interest rates calculated with reference to benchmarks, such as fixed deposit rates (“**FDR**”), minimum loan rates (“**MLR**”), Thai Baht Interest Rate Fixing (“**THBFIX**”), Bangkok Interbank Offered Rate (“**BIBOR**”) and the Euro Interbank Offered Rate (“**EURIBOR**”). FDR and MLR are interest rates which are calculated and announced by each commercial bank, while THBFIX, BIBOR and EURIBOR rates are calculated by third parties. Interest payments are payable either monthly, quarterly or semi-annually, and the payments must be made on each interest payment date as provided in the respective loan agreement. As of December 31, 2019, the interest rates on our loans ranged from approximately 0.50% to 3.32% per annum.

### *Covenants*

Under the bank loans, we have agreed, among other things, to comply with certain covenants including the maintenance of certain financial ratios and change of control. In addition, we have agreed, among other things, not to take the following actions without obtaining the relevant lender’s prior written consent (in the case of a bilateral loan) or the prior written consent from a group of lenders to whom we owe more than two-thirds of the total principal amount (in the case of a syndicated loan):

- creating a security interest or any other encumbrance on our assets and revenue, unless certain conditions prescribed in the such bank loan agreements are met, such as where the security interest or encumbrance is created by operation of law or is created on properties to secure payment or repayment of indebtedness incurred to finance the purchase price of such properties;
- materially changing the nature of our business;
- materially changing the corporate existence and entering into any amalgamation, demerger, merger or corporate reconstructing; and
- amending or granting any release or waiver with respect to certain agreements such operating services agreements, supply agreements and product offtake agreements, in a manner or to an extent which would have a material adverse effect.

### *Events of Default*

The bank loan agreements contain certain customary events of default, such as failure to pay, cross-acceleration of repayment obligations under other loan or financing documents in excess of 3% of our equity as appeared on the relevant financial statements or a prescribed threshold ranging between THB1,200.0 million and THB3,500.0 million, as applicable, the occurrence of certain bankruptcy, reorganization, liquidation-related

events, and government intervention. Moreover, events of default under the bank loans typically include PTT ceasing to directly or indirectly own at least 40%, as applicable, of our issued share capital. Upon the occurrence of an event of default, the lenders are entitled to terminate their respective commitments and/or demand immediate repayment of the loans and any accrued interest.

### **Thai Baht Bonds**

From time to time, we issue and offer bonds to institutional investors and the public in Thailand. These bonds are typically denominated in Baht and are unsecured and unsubordinated. The proceeds from these bonds are used to finance our investment projects and working capital and to refinance our loans and other indebtedness. Other than with respect to specific pricing terms of each tranche, the terms and conditions of the Thai Baht bonds are substantially similar to each other. The terms of the Thai Baht bonds range from four to 15 years. As of December 31, 2020, the aggregate outstanding amount under the these bonds totaled THB54,960.6 million (US\$1,831.4 million), of which THB19,997.5 million (US\$666.4 million) would be due within one year and THB11,488.1 million (US\$382.8 million) would be due between three and five years (THB23,475.0 million (US\$782.2 million) is callable after five years).

### ***Interest***

The Thai Baht bonds generally bear interest at fixed rates. Interest payments are payable semi-annually. As of December 31, 2020 the interest rates on our Thai Baht bonds ranged from 2.2% to 4.5% per annum based on the duration of the particular bonds.

### ***Covenants***

Under the terms and conditions of the Thai Baht bonds, we have agreed, among other things, not to take the following actions, unless certain conditions are met:

- creating a security interest or any other encumbrance on our assets, unless certain conditions prescribed in the terms and conditions of the Thai Baht bonds are met, such as where the security interest or encumbrance is created by operation of law, is for the purpose of carrying out our ordinary course of business, or is for the benefit of holders of the Thai Baht bonds;
- selling or disposing of our assets, unless certain conditions prescribed in the terms and conditions of the Thai Baht bonds are met, such as where the sale or disposition of assets is in our ordinary course of business or which does not have a material adverse effect on our ability to repay the Thai Baht bonds; and
- upon an occurrence of an event of default due to the fact that we fail to make a payment for principal or interest due, paying cash dividend to our shareholders.

Further to the negative covenants mentioned above, we have also agreed to use our best effort to maintain our listing status on the SET. Moreover, one of the covenants under the Thai Baht bonds also requires us to procure that PTT shall maintain its shareholding directly or indirectly at least 40.0% of our total voting right.

### ***Events of Default***

The terms and conditions of the Thai Baht bonds contain certain customary events of default, such as failure to pay the amount payable on the due date, failure to comply with other terms of the Thai Baht bonds, acceleration of repayment obligations under other loan or financing documents totaling an amount ranging from US\$30.0 million to US\$100.0 million or from THB1,200.0 million to THB3,500.0 million, whichever is higher, bankruptcy, reorganization, liquidation, and being subject to court order to repay any indebtedness which would have a material adverse effect on our ability to repay the Thai Baht bonds. The holders of the Thai Baht bonds are entitled to demand immediate repayment of the Thai Baht bonds and any accrued interest upon the occurrence of an event of default.

### **U.S. Dollar Bonds**

On September 19, 2012, we issued bonds in a principal amount of US\$1,000,000,000 and an interest rate of 4.25% per annum (the “**USD Bonds due 2022**”). The USD Bonds due 2022 ranked pari passu with all our other present and future outstanding unsecured and unsubordinated obligations.

On June 28, 2018, by way of tender offers, we repurchased US\$495,894,000 in principal amount of the USD Bonds due 2022 from existing holders of such notes. Concurrently with such repurchase, the Treasury Center issued US\$495,894,000 in principal amount of senior unsecured bonds due 2022 and an interest rate of 4.25% per annum (the “**TC 2022 Bonds**”). The Company acted as guarantor of the TC 2022 Bonds, which have substantially identical terms as the USD Bonds due 2022.

As of December 31, 2020, the outstanding amounts under the USD Bonds due 2022 and TC 2022 Bonds were US\$504,106,000 and US\$495,894,000, respectively.

### ***Interest***

The USD Bonds due 2022 and the TC 2022 Bonds bear interest on their outstanding principal amount at the rate of 4.25% per annum, payable semi-annually in arrears. In the event of a change of control triggering event (as defined in the terms and conditions of the USD Bonds due 2022 and the TC 2022 Bonds), the interest rate payable will be subject to an increase of 1.50%.

### ***Covenants***

Under the terms and conditions of the USD Bonds due 2022 and the TC 2022 Bonds, we are subject to covenants that restrict us and certain of our subsidiaries from creating any security interest over our present or future business, undertaking, assets or revenues to secure certain indebtedness unless we ensure, among others, that all amounts payable under the USD Bonds due 2022 and TC 2022 Bonds are secured by an equal and ratable security interest. We are also subject to covenants not to enter into any consolidation, merger or sale of assets unless, among others, the successor entity expressly assumes all of our obligations under the USD Bonds due 2022 and TC 2022 Bonds.

### ***Events of Default***

The terms and conditions of the USD Bonds due 2022 and the TC 2022 Bonds contain certain customary events of default, including default in the payment of any principal or interest due in respect of the USD Bonds due 2022 and the TC 2022 Bonds, and other events of defaults such as liquidation, insolvency and government intervention.

### ***Maturity, Purchases and Redemption***

The maturity date on the USD Bonds due 2022 and the TC 2022 Bonds is September 19, 2022.

At any time prior to the maturity date, the issuer or any of its subsidiaries may purchase the USD Bonds due 2022 and the TC 2022 Bonds in the open market or otherwise at any price. If purchases are made by tender, tenders must be available to all holders of such bonds alike.

Additionally, the issuer may on any one or more occasions redeem all or part of the USD Bonds due 2022 or the TC 2022 Bonds at a redemption price equal to 100.0% of the principal amount of the Notes redeemed plus the applicable premium (as defined under the terms and conditions) and any accrued and unpaid interest.

Subject to exceptions, if we become obligated to pay certain additional amounts as a result of certain changes in specified tax law, we may redeem the USD Bonds due 2022 or the TC 2022 Bonds, in whole but not in part, at a redemption price equal to 100% of the principal amount of such bonds, plus any accrued interest.

## TAXATION

### Thai Taxation

*The following is a summary of the principal Thai tax consequences of the purchase, ownership and disposition of the Notes by individual and corporate investors who are not resident in Thailand for tax purposes (referred to as “non-resident individual holders” and “non-resident corporate holders,” respectively, and together as “non-resident holders”) based on Thai tax laws and their implementing regulations in force as of the date of this Offering Memorandum. The summary does not address any laws other than the tax laws of Thailand. It does not purport to be a comprehensive description of all of the tax considerations that may be relevant to a decision to purchase the Notes. Prospective investors in all jurisdictions are advised to consult their own tax advisors as to other tax consequences of the purchase, ownership and disposition of the Notes, including the consequences under Thai laws, the laws of the country of which they are resident and any double taxation agreement between Thailand and their country of residence for tax purposes.*

#### **Income Tax**

##### *Non-resident Individual Holders*

A non-resident individual holder is an individual owner of Notes that has not resided in Thailand at one or more times for a period or periods equal in the aggregate to 180 days or more in any calendar year, regardless of the nationality of the individual holders but receives from or within Thailand interest or premium on the Notes or capital gains arising from the transfer of the Notes.

##### *Interest*

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident individual holders provide otherwise, interest paid or deemed to be paid on the Notes from or within Thailand to a non-resident individual holder is subject to a 15% withholding tax on the gross amount of the interest payment.

##### *Capital Gains*

Capital gains (being the amount received in excess of the cost of acquisition of the Notes) received by a non-resident individual holder from the sale or other disposition of Notes outside Thailand in connection with which payment is made neither from nor within Thailand and where neither the purchaser nor the seller resides or carries on business in Thailand are not subject to Thai withholding tax.

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident individual holders provide otherwise, capital gain received by a non-resident individual holder from a sale or other disposition of Notes in which payment is made or deemed to be made from or within Thailand is subject to a 15% withholding tax on the gross amount of the capital gains payment. The transferee or the payer of the gain has a duty to withhold tax at such rate and remit the withholding tax to the Revenue Department of Thailand.

##### *Premium*

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident individual holders provide otherwise, any premium (being the amount received in excess of the interest and the principal amount paid upon a redemption of the Notes) paid or deemed to be paid on the Notes from or within Thailand to a non-resident individual holder is subject to a 15% withholding tax on the gross amount of the premium.

##### *Non-resident Corporate Holders*

A non-resident corporate holder is an owner of Notes that is a company, a registered partnership or any entity established pursuant to a foreign law that is not doing business in Thailand or deemed to be doing business in Thailand or does not have a permanent establishment, employees, agents or representatives in Thailand but receiving from or within Thailand interest or premium on the Notes or capital gains arising from the transfer of the Notes.

### *Interest*

Interest paid or deemed to be paid on the Notes by the Issuer to a non-resident corporate holder that is a company or limited partnership established under a foreign law (a “**Qualified Non-resident Corporate Holder**”) are exempted from Thai corporate income tax, to the extent that the Issuer remains qualified as a treasury centre approved by the Bank of Thailand and has the international business centre status pursuant to the rules and regulations of the Revenue Department of Thailand and all other conditions for a Thai corporate income tax exemption with respect to the interest made by the Issuer in accordance with the Royal Decree issued pursuant to the Revenue Code on Reduction and Exemption of Taxes are fully satisfied.

If any of the qualifications or conditions for a Qualified Non-resident Corporate Holder’s Thai corporate income tax exemption referred to in the paragraph above are no longer met, interest paid or deemed to be paid on the Notes by the Issuer to a Qualified Non-resident Corporate Holder will be subject to a withholding tax at the rate of 15% on the gross amount of the interest payment, unless the terms and conditions of applicable double taxation agreement between Thailand and the resident country of such non-resident corporate holder provide otherwise.

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident corporate holders provide otherwise, interest paid or deemed to be paid on the Notes from or within Thailand to a non-resident corporate holder that is not a Qualified Non-resident Corporate Holder will, in any case, be subject to 15% withholding tax on the gross amount of the interest payment.

### *Capital Gains*

Capital gains (being the amount received in excess of the cost of acquisition of the Notes) received by a non-resident corporate holder from the sale or other disposition of Notes outside Thailand in connection with which payment is made neither from nor within Thailand and where neither the purchaser nor the seller resides or carries on business in Thailand are not subject to Thai withholding tax.

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident corporate holder provide otherwise, a capital gain received by a non-resident corporate holder from a sale or other disposition of Notes in which payment is made or deemed to be paid from or within Thailand is subject to a 15% withholding tax on the gross amount of the capital gains payment. The transferee or the payer of the gain has a duty to withhold tax at such rate and remit the withholding tax to the Revenue Department of Thailand.

### *Premium*

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident corporate holders provide otherwise, any premium (being the amount received in excess of the interest and the principal amount paid upon a redemption of the Notes) paid or deemed to be paid on the Notes from or within Thailand to a non-resident corporate holder is subject to 15% withholding tax on the gross amount of premium paid.

### ***Income Tax in connection with a Guarantee Payment by the Guarantor***

Thai taxation with respect to any payment made to the holders of the Notes by the Guarantor pursuant to its obligations under the Guarantee, if part of the guaranteed payment is considered by the Thai authorities as payment of interest and/or premium (as described below) from or in Thailand, is as set out below.

#### *Non-resident Individual Holders*

##### *Interest*

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident individual holders provide otherwise, interest paid or deemed to be paid on the Notes by the Guarantor from or within Thailand to a non-resident individual holder is subject to 15% withholding tax on the gross amount of interest payment.

### *Premium*

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident individual holders provide otherwise, any premium (being the amount received in excess of the interest and the principal amount paid upon a redemption of the Notes) paid or deemed to be paid on the Notes by the Guarantor from or within Thailand to a non-resident individual holder is subject to 15% withholding tax on the gross amount of premium.

### *Non-resident Corporate Holders*

#### *Interest*

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident corporate holders provide otherwise, interest paid or deemed to be paid on the Notes by the Guarantor from or within Thailand to a non-resident corporate holder (including a Qualified Non-resident Corporate Holder) will be subject to 15% withholding tax on the gross amount of the interest payment.

#### *Premium*

Unless the terms and conditions of applicable double taxation agreement entered into between Thailand and the resident country of the non-resident corporate holders provide otherwise, any premium (being the amount received in excess of the interest and the principal amount paid upon a redemption of the Notes) paid or deemed to be paid on the Notes by the Guarantor from or within Thailand to a non-resident corporate holder is subject to 15% withholding tax on the gross amount of premium.

### *Double Taxation Agreement*

Presently, Thailand concluded double taxation agreements with more than 60 countries. The rate of withholding tax applicable to individual and corporate holders of the Notes, who are regarded as tax residents of the countries which are parties to the double taxation agreements and receive interest payments in respect of the Notes that are subject to withholding tax, may be reduced or exempted depending on the terms and conditions of the particular tax agreement.

Corporate and individual holders of the Notes residing in such a country for tax purposes, who are not regarded as tax residents in Thailand, may be entitled to an exemption or reduction from Thai withholding tax for the capital gain received from or within Thailand depending on the terms and conditions of the particular tax treaty.

### *Value Added Tax*

Interest and premium on the Notes and capital gains derived from the transfer of the Notes are not subject to value added tax in Thailand.

### *Specific Business Tax*

Interest on the Notes and capital gains derived from the transfer of the Notes are not subject to specific business tax in Thailand. However, Thai specific business tax would apply at a rate which varies depending on the type of business and income if a person who receives the interest on the Notes and capital gains derived from the transfer of the Notes is a person carrying on a banking business, finance business, securities business or business similar to a commercial bank in Thailand.

### *Stamp Duty*

Each Note certificate will be subject to a stamp duty of THB5.0 in Thailand. Stamp duty will be triggered when Note certificate is issued in Thailand, or is brought into Thailand if issued outside Thailand. An instrument of transfer of the Notes is exempted from stamp duty.

The Guarantee will be subject to a stamp duty of THB 10 in Thailand. Stamp duty will be triggered when the Guarantee is executed in Thailand or is brought into Thailand if executed outside Thailand.



## United States Federal Income Taxation

The following discussion is a summary of certain U.S. federal income tax consequences of the purchase, ownership and disposition of the Notes by a U.S. holder (defined below), but does not purport to be a complete analysis of all potential tax effects.

This summary is based upon the U.S. Internal Revenue Code of 1986, as amended (the “Code”), Treasury regulations issued thereunder and judicial and administrative interpretations thereof, each as of the date hereof, and all of which are subject to change, possibly with retroactive effect. There can be no assurance that the United States Internal Revenue Service (the “IRS”) will not take a different position concerning the tax consequences of the purchase, ownership or disposition of the Notes or that any such position would not be sustained. This discussion does not address state, local, foreign or tax laws other than U.S. Federal income tax law. This discussion does not address all of the U.S. federal income tax consequences that may be relevant to a U.S. holder in light of such U.S. holder’s particular circumstances or to U.S. holders subject to special rules, such as banks, insurance companies and other financial institutions, certain U.S. expatriates or former long-term residents of the United States, dealers in securities, traders in securities that elect mark-to-market tax accounting, partnerships or other pass-through entities or persons holding the Notes through such entities, U.S. holders whose functional currency is not the U.S. dollar, tax-exempt organizations, regulated investment companies, real estate investment trusts, persons subject to alternative minimum tax or Medicare tax on net investment income, persons subject to special tax accounting rules as a result of any item of gross income with respect to the Notes being taken into account in an applicable financial statement, persons holding the Notes as part of a “straddle,” “hedge,” “conversion transaction” or other integrated transaction and persons deemed to sell Notes under the “constructive sale” provisions of the Code. In addition, this discussion is limited to U.S. holders (except that the discussion below regarding Foreign Account Tax Compliance applies to all holders) who purchase the Notes for cash at the price set forth in the applicable Pricing Supplement and who hold the Notes as capital assets (generally, property held for investment) for U.S. federal income tax purposes.

The following discussion only addresses Notes that (i) are denominated in U.S. dollars, (ii) provide for a fixed rate of interest, (iii) have a term to maturity exceeding one year but not more than 30 years, and (iv) are issued without (1) bond premium or (2) pre-issuance accrued interest, each as defined for U.S. federal income tax purposes. If we issue Notes that do not meet all of these conditions, the applicable Pricing Supplement will describe the U.S. federal income tax consequences relating to such Notes to the extent they differ from the consequences described below. Additionally, in certain circumstances, U.S. federal income tax consequences not discussed below may apply if the issue price of the Notes is payable in more than one instalment.

**THIS SUMMARY IS NOT INTENDED TO CONSTITUTE A COMPLETE ANALYSIS OF ALL TAX CONSEQUENCES RELATING TO THE OWNERSHIP OF THE NOTES. PROSPECTIVE PURCHASERS OF THE NOTES SHOULD CONSULT THEIR OWN TAX ADVISORS CONCERNING THE TAX CONSEQUENCES OF THEIR PARTICULAR SITUATIONS.**

For purposes of this discussion, a “U.S. holder” is a beneficial owner of a Note that is for U.S. federal income tax purposes: (i) an individual who is a citizen or resident of the United States; (ii) a corporation or any entity taxable as a corporation created or organized in or under the laws of the United States, any state thereof or the District of Columbia; (iii) an estate the income of which is subject to U.S. federal income taxation regardless of its source; or (iv) a trust if (A) a court within the United States is able to exercise primary supervision over the administration of the trust and one or more U.S. persons have the authority to control all substantial decisions of the trust or (B) it has made a valid election to be treated as a domestic trust.

If an entity that is classified as a partnership for U.S. federal income tax purposes holds Notes, the tax treatment of a partner in the partnership will generally depend upon the status of the partner and the activities of the partnership. Such partnerships and their partners should consult their tax advisors regarding the tax consequences of their particular situations.

### *Characterization of the Notes*

The Direct Issuance Notes, when issued, are generally expected to be characterized as debt for U.S. tax purposes. By comparison, the characterization of the Guaranteed Notes as debt or equity for U.S. federal income tax purposes is not entirely clear. The Treasury Center, the Issuer of the Guaranteed Notes, owns only limited assets and no subsidiaries. Furthermore, in accordance with the terms of the Guaranteed Notes under the Indenture, the Guarantor’s obligations are limited to a Maximum Guaranteed Amount in respect of each Series of Guaranteed Notes. We intend to treat the Guaranteed Notes as debt for U.S. federal income tax purposes, and the following

discussion assumes such treatment. However, there can be no assurance that the IRS or the courts would agree with such treatment. If the Guaranteed Notes were treated as equity, they could be treated as equity interests in a passive foreign investment company, which may result in adverse U.S. tax consequences to U.S. holders of the Guaranteed Notes.

In addition, with respect to both the Guaranteed Notes and the Direct Issuance Notes, we are required to pay additional amounts with respect to Thai taxes withheld on interest payments, subject to certain exceptions and limitations. In addition, under certain circumstances, we may be obligated to pay amounts in excess of the principal and interest on the Notes. The following discussion assumes that the additional amounts we are required to pay will remain constant throughout the term of the Notes and that there is only a remote possibility that we will be required to pay different amounts. Based on such assumption, we believe that it is unlikely that the Notes will be treated as contingent payment debt instruments. However the IRS may not agree and may treat the Notes as contingent payment debt instruments. In such case, U.S. holders may be required to accrue interest at a rate higher than the yield to maturity and recognize ordinary income rather than capital gain upon a sale, exchange or redemption of the Notes. U.S. holders should consult their tax advisors regarding the potential application of the contingent payment debt instrument rules to the Notes and the tax consequences thereof.

#### ***Stated Interest and Original Issue Discount***

Payments of stated interest on the Notes that constitutes “qualified stated interest” generally will be taxable to a U.S. holder as ordinary income at the time that such payments are received or accrued, in accordance with such U.S. holder’s method of accounting for U.S. federal income tax purposes. Stated interest payments on a Note that are unconditionally payable in cash at least annually at a single fixed rate would generally constitute “qualified stated interest.”

A Note will be treated as issued with OID if the excess of the Note’s “stated redemption price at maturity” over its issue price is greater than or equal to a *de minimis* amount (0.25% of the Note’s stated redemption price at maturity multiplied by the number of complete years to its maturity or, in the case of an installment obligation, the weighted average maturity date of the Note, as defined in the applicable Treasury Regulations). Generally, the issue price of a Note will be the first price at which a substantial amount of Notes included in the issue of which the Note is a part is sold for money to persons other than bond houses, brokers, or similar persons or organizations acting in the capacity of underwriters, placement agents, or wholesalers. The stated redemption price at maturity of a Note is the total of all payments provided by the Note that are not payments of qualified stated interest.

If the Notes are treated as issued with OID, U.S. holders must include OID in income as it accrues, using a constant-yield method generally before the receipt of cash attributable to the income, and generally will have to include in income increasingly greater amounts of OID over the life of the Notes. The amount of OID includible in income by a U.S. holder of a Note is the sum of the daily portions of OID with respect to the Note for each day during the taxable year or portion of the taxable year on which the U.S. holder holds the Note. The daily portion is determined by allocating to each day in any “accrual period” a pro rata portion of the OID allocable to that accrual period. Accrual periods with respect to a Note may be of any length and may vary in length over the term of the Note as long as (i) no accrual period is longer than one year and (ii) each scheduled payment of interest or principal on the Note occurs on either the final or first day of an accrual period. The amount of OID allocable to an accrual period equals the excess of (a) the product of the Note’s adjusted issue price at the beginning of the accrual period and the Note’s yield to maturity (determined on the basis of compounding at the close of each accrual period and properly adjusted for the length of the accrual period) over (b) the sum of the payments of qualified stated interest on the Note allocable to the accrual period. The “adjusted issue price” of a Note at the beginning of any accrual period is the issue price of the Note increased by (x) the amount of accrued OID for each prior accrual period and decreased by (y) the amount of any payments previously made on the Note that were not qualified stated interest payments.

It is expected that interest payments will be subject to Thai withholding taxes (see “—*Thai Taxation—Income Tax*”). Such Thai withholding taxes and any other non-U.S. tax withheld together with the gross amount of any additional amounts paid to a U.S. holder will also be included in such holder’s income at the time such amount is received or accrued in accordance with such holder’s method of accounting for U.S. federal income tax purposes. Any non-U.S. tax withheld on interest paid to a U.S. holder (taking into account any applicable income tax treaty) will, subject to limitations and conditions, be treated as foreign income tax eligible for credit against such holder’s U.S. federal income tax liability or, at such holder’s election, eligible for deduction in computing such holder’s U.S. federal taxable income. To the extent the amount of such non-U.S. withholding tax is based on a withholding rate in excess of the rate otherwise applicable to a U.S. holder (taking into account any applicable

income tax treaty), such excess amount may not be eligible as foreign income tax eligible for credit or deduction in computing such holder's U.S. federal income tax liability.

Interest income on a Note as well as any additional amounts and OID generally will constitute foreign source income and generally will be considered "passive category" income in computing the foreign tax credit allowable to U.S. holders under U.S. federal income tax laws. The rules relating to the treatment of non-U.S. taxes imposed on a U.S. holder and foreign tax credits are complex, and U.S. holders should consult their tax advisors about the impact of these rules in their particular situations.

### ***Sale, Exchange and Redemption of Notes***

Generally, upon the sale, exchange or redemption of a Note, a U.S. holder will recognize taxable gain or loss equal to the difference between the amount realized on the sale, exchange or redemption (less any amount attributable to accrued but unpaid qualified stated interest, which will be taxable as interest as described above) and such U.S. holder's tax basis in the Note. A U.S. holder's tax basis in a Note will generally equal the cost of the Note to such U.S. holder, increased by the amount of any OID included in the U.S. holder's income with respect to the Note and reduced by the amount of any payments that are not qualified stated interest payments. Such gain or loss generally will be capital gain or loss and will be long-term capital gain or loss if at the time of sale, exchange or redemption the Note has been held by such U.S. holder for more than one year. Such gain or loss will generally be U.S. source, subject to the potential applicability of the sourcing rules in the income tax treaty between the United States and Thailand. The deductibility of capital losses is subject to limitations. As described in "*—Thai Taxation,*" gain from the sale of a Note may be subject to Thai tax in certain circumstances. U.S. holders should consult their tax advisors regarding the creditability of any such tax.

### ***Information Reporting and Backup Withholding***

Information returns may be filed with the IRS in connection with payments on, and accrued OID on, the Notes and the proceeds from a sale or other disposition of a Note. A U.S. holder may be subject to U.S. backup withholding on these payments and accruals of OID if it fails to provide its tax identification number to the paying agent and comply with certain certification procedures or otherwise establish an exemption from backup withholding. The amount of any backup withholding from a payment to a U.S. holder will be allowed as a credit against the holder's U.S. federal income tax liability and may entitle the holder to a refund, provided that the required information is timely furnished to the IRS.

Individuals who own "specified foreign financial assets" with an aggregate value in excess of specified thresholds are generally required to file an information report with respect to such assets with their tax returns. "Specified foreign financial assets" include any financial accounts maintained by foreign financial institutions, as well as securities issued by non-U.S. persons (e.g., the Notes), but only if they are not held in accounts maintained by certain financial institutions. Individuals required to file U.S. federal income tax returns are urged to consult their tax advisors regarding the application of this rule to their ownership of the Notes.

### ***Foreign Account Tax Compliance***

Pursuant to Section 1471 through 1474 of the Code (provisions commonly known as "FATCA"), a "foreign financial institution" may be required to withhold U.S. tax on certain "foreign passthru payments" to the extent such payments are treated as attributable to certain U.S.-source payments. Currently, the term "foreign passthru payment" is not defined and it is unclear whether or to what extent payments on the Notes would be considered foreign passthru payments, assuming the Company were treated as a foreign financial institution. Debt obligations issued on or prior to the date that is six months after the date on which applicable final Treasury Regulations defining "foreign passthru payment" are filed with the Federal Register generally would be "grandfathered" (and therefore not subject to withholding under FATCA) unless such obligations are materially modified after such date. If the Issuer or the Guarantor is treated as a foreign financial institution, FATCA is expected to apply to payments on the Notes only if there is a significant modification of the Notes for U.S. federal income tax purposes after the expiration of the grandfathering period.

Under proposed regulations, any FATCA withholding on foreign passthru payments on debt instruments that are not otherwise grandfathered would only apply to foreign passthru payments made on or after the date that is two years after the date on which final regulations are published in the Federal Register defining foreign passthru payments. Taxpayers generally may rely on these proposed regulations until final regulations are issued. In the event any FATCA withholding is imposed with respect to any payments on the Notes, there will be no Additional Amounts payable to compensate for the withheld amount.

Certain non-U.S. governments (including Thailand) have entered into intergovernmental agreements with the United States to implement FATCA in a manner that may alter the rules described herein. Under such intergovernmental agreements, the Company may be required to report certain information regarding investors to non-U.S. tax authorities, which information may be shared with taxing authorities in the United States. Holders should consult their tax advisors on any applicable intergovernmental agreements and how these rules may apply to their investment in the Notes.

## **Singapore Taxation**

The statements below are general in nature and are based on certain aspects of current tax laws in Singapore and administrative guidelines and circulars issued by the Inland Revenue Authority of Singapore (“IRAS”), and the Monetary Authority of Singapore (“MAS”) in force as at the date of this Offering Memorandum and are subject to any changes in such laws, administrative guidelines or circulars, or the interpretation of those laws, administrative guidelines or circulars occurring after such date, which changes could be made on a retroactive basis. These laws, administrative guidelines and circulars are also subject to various interpretations and the relevant tax authorities or the courts could later disagree with the explanations or conclusions set out below. Neither these statements nor any other statements in this Offering Memorandum are intended or are to be regarded as advice on the tax position of any holder of Notes or of any person acquiring, selling or otherwise dealing with Notes or on any tax implications arising from the acquisition, sale or other dealings in respect of the Notes. The statements made herein do not purport to be a comprehensive or exhaustive description of all the tax considerations that may be relevant to a decision to subscribe for, purchase, own or dispose of Notes and do not purport to deal with the tax consequences applicable to all categories of investors, some of which (such as dealers in securities or financial institutions in Singapore which have been granted the relevant Financial Sector Incentive(s)) may be subject to special rules or tax rates. The statements should not be regarded as advice on the tax position of any person and should be treated with appropriate caution. Prospective holders and holders of Notes are advised to consult their own professional tax advisers as to the Singapore or other tax consequences of the acquisition, ownership of or disposal of Notes, including, in particular, the effect of any foreign, state or local tax laws to which they are subject. It is emphasized that none of the Issuer, the Arranger, the Dealers and any other persons involved in the Program or any issuance of Notes accepts responsibility for any tax effects or liabilities resulting from the subscription for, purchase, holding or disposal of Notes.

### ***Interest and Other Payments***

With respect to any Tranche of Notes issued as debt securities under this Program (the “**Relevant Notes**”) during the period from the date of this Offering Memorandum to 31 December 2023 where, pursuant to the ITA, more than half of the issue of such Relevant Notes is distributed by one or more Financial Sector Incentive (Capital Market) Companies (as defined in the ITA), Financial Sector Incentive (Standard Tier) Companies (as defined in the ITA) and/or Financial Sector Incentive (Bond Market) Companies (as defined in the ITA), such Relevant Notes would be “qualifying debt securities” (“**QDS**”) for the purposes of the ITA, to which the following treatments shall apply.

Subject to certain prescribed conditions having been fulfilled, including the furnishing by the Issuer, or such other person as the MAS may direct, to the MAS of a return on debt securities for the Relevant Notes in the prescribed format within one month of the date of issue of the relevant debt securities or such period as the MAS may specify and such other particulars in connection with the Relevant Notes as the MAS may require, Qualifying Income from the Relevant Notes derived by any company or body of persons (as defined in the ITA) in Singapore is subject to income tax at a concessionary rate of 10 per cent. (except for holders of the relevant Financial Sector Incentive(s) who may be taxed at different rates).

Notwithstanding the foregoing:

- (a) if during the primary launch of any Tranche of Notes, the Notes of such Tranche are issued to fewer than four persons and 50 per cent. or more of the issue of such Tranche of Notes are beneficially held or funded, directly or indirectly, by related parties of the Issuer, such Tranche of Notes would not qualify as QDS; and
- (b) even though a particular Tranche of Notes are QDS, if, at any time during the tenure of such Tranche of Notes, 50 per cent. or more of such Tranche of Notes which are outstanding at any time during the life of their issue is beneficially held or funded, directly or indirectly, by related parties of the Issuer, Qualifying Income derived from such Tranche of Notes held by:

- (i) any related party of the Issuer; or
- (ii) any other person where the funds used by such person to acquire such Tranche of Notes are obtained, directly or indirectly, from any related party of the Issuer,

shall not be eligible for the tax exemption or concessionary rate of tax as described above.

The term “**related party**”, in relation to a person, means any other person who, directly or indirectly, controls that person, or is controlled, directly or indirectly, by that person, or where he and that other person, directly or indirectly, are under the control of a common person.

The terms “**prepayment fee**”, “**redemption premium**” and “**break cost**” are defined in the ITA as follows:

“**prepayment fee**”, in relation to debt securities and qualifying debt securities, means any fee payable by the issuer of the securities on the early redemption of the securities, the amount of which is determined by the terms of the issuance of the securities;

“**redemption premium**”, in relation to debt securities and qualifying debt securities, means any premium payable by the issuer of the securities on the redemption of the securities upon their maturity; and

“**break cost**”, in relation to debt securities and qualifying debt securities, means any fee payable by the issuer of the securities on the early redemption of the securities, the amount of which is determined by any loss or liability incurred by the holder of the securities in connection with such redemption.

References to “**prepayment fee**”, “**redemption premium**” and “**break cost**” in this Singapore tax disclosure have the same meaning as defined in the ITA.

All foreign-sourced income received in Singapore on or after 1 January 2004 by Singapore tax-resident individuals will be exempt from income tax, provided such foreign-sourced income is not received through a partnership in Singapore.

Where interest, discount income, prepayment fee, redemption premium or break cost (i.e. the Qualifying Income) is derived from the Relevant Notes by any person who is not resident in Singapore and who carries on any operations in Singapore through a permanent establishment in Singapore, the tax exemption available for QDS under the ITA (as mentioned above) shall not apply if such person acquires such Relevant Notes using the funds and profits of such person's operations through a permanent establishment in Singapore. Any person whose interest, discount income, prepayment fee, redemption premium or break cost (i.e. the Qualifying Income) derived from such Relevant Notes is not exempt from tax is required to include such income in a return of income made under the ITA.

### ***Capital Gains***

Any gains considered to be in the nature of capital made from the sale of Notes will not be taxable in Singapore. However, any gains derived by any person from the sale of Notes which are gains from any trade, business, profession or vocation carried on by that person, if accruing in or derived from Singapore, may be taxable as such gains are considered revenue in nature.

Noteholders who are adopting the Financial Reporting Standard (“**FRS**”) FRS 39, FRS 109 or Singapore Financial Reporting Standard (International) 9 (“**SFRS(I) 9**”) (as the case may be), may for Singapore income tax purposes, be required to recognise gains or losses (not being gains or losses in the nature of capital) on the Notes, irrespective of disposal, in accordance with FRS 39 or FRS 109, or SFRS(I) 9 (as the case may be). Please see the section below on “*Adoption of FRS 39, FRS 109 or SFRS(I) 9 for Singapore Income Tax Purposes.*”

### ***Adoption of FRS 39, FRS 109 or SFRS(I) 9 for Singapore Income Tax Purposes***

Section 34A of the ITA provides for the tax treatment for financial instruments in accordance with FRS 39 (subject to certain exceptions and “opt-out” provisions) to taxpayers who are required to comply with FRS 39 for financial reporting purposes. The IRAS has also issued a circular entitled “Income Tax Implications Arising from the Adoption of FRS 39 - Financial Instruments: Recognition and Measurement.”

FRS 109 or SFRS(I) 9 (as the case may be) is mandatorily effective for annual periods beginning on or after 1 January 2018, replacing FRS 39. Section 34AA of the ITA requires taxpayers who comply or who are required to comply with FRS 109 or SFRS(I) 9 (as the case may be) for financial reporting purposes to calculate their profit, loss or expense for Singapore income tax purposes in respect of financial instruments in accordance with FRS 109 or SFRS (I) 9 (as the case may be), subject to certain exceptions. The IRAS has also issued a circular entitled “Income Tax: Income Tax Treatment Arising from Adoption of FRS 109 – Financial Instruments.”

Noteholders who may be subject to the tax treatment under Sections 34A or 34AA of the ITA should consult their own accounting and tax advisers regarding the Singapore income tax consequences of their acquisition, holding or disposal of the Notes.

#### ***Estate Duty***

Singapore estate duty has been abolished with respect to all deaths occurring on or after 15 February 2008.

## CLEARANCE AND SETTLEMENT

The information set out below is subject to any change in or reinterpretation of the rules, regulations and procedures of DTC, Euroclear or Clearstream (together, the “**Clearing Systems**”) currently in effect. The information in this section concerning the Clearing Systems has been obtained from sources that the Issuers and the Guarantor believe to be reliable, but none of the Issuers, the Guarantors or any Dealer takes any responsibility for the accuracy thereof. Investors wishing to use the facilities of any of the Clearing Systems are advised to confirm the continued applicability of the rules, regulations and procedures of the relevant Clearing System. The Issuers will not have any responsibility or liability for any aspect of the records relating to, or payments made on account of, beneficial ownership interests in the Notes held through the facilities of any Clearing System or for maintaining, supervising or reviewing any records relating to such beneficial ownership interests.

### The Clearing Systems

#### *DTC*

DTC has advised us that it is a limited purpose trust company organized under the New York Banking Law, a “banking organization” within the meaning of the New York Banking Law, a “clearing corporation” within the meaning of the New York Uniform Commercial Code and a “clearing agency” registered pursuant to Section 17A of the Exchange Act. DTC holds securities that its participants (“**Participants**”) deposit with DTC. DTC also facilitates the clearance and settlement among Participants of securities transactions, such as transfers and pledges, in deposited securities through electronic computerized book-entry changes in Participants’ accounts, thereby eliminating the need for physical movement of securities certificates. DTC is owned by a number of its direct participants (“**Direct Participants**”), which include securities brokers and dealers, banks, trust companies, clearing corporations and certain other organizations. Access to the DTC System is also available to others such as securities brokers and dealer, banks and trust companies that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly (“**Indirect Participants**”).

Under the rules, regulations and procedures creating and affecting DTC and its operations (the “**Rules**”), DTC makes book-entry transfers of Notes among Direct Participants on whose behalf it acts with respect to Notes accepted into DTC’s book-entry settlement system (“**DTC Notes**”) as described below and receives and transmits distributions of principal and interest on DTC Notes. The Rules are on file with the U.S. Securities and Exchange Commission. Direct Participants and Indirect Participants with which beneficial owners of DTC Notes (“**Owners**”) have accounts with respect to the DTC Notes similarly are required to make book-entry transfers and receive and transmit such payments on behalf of their respective Owners. Accordingly, although Owners who hold DTC Notes through Direct Participants or Indirect Participants will not possess Notes, the Rules, by virtue of the requirements described above, provide a mechanism by which Direct Participants will receive payments and will be able to transfer their interest in respect of the DTC Notes.

Purchases of DTC Notes under the DTC system must be made by or through Direct Participants, which will receive a credit for the DTC Notes on DTC’s records. The ownership interest of each actual purchaser of each DTC Note (“**Beneficial Owner**”) is in turn to be recorded on the Direct and Indirect Participant’s records. Beneficial Owners will not receive written confirmation from DTC of their purchase, but Beneficial Owners are expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the DTC Notes are to be accomplished by entries made on the books of Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in DTC Notes, except in the event that use of the book-entry system for the DTC Notes is discontinued.

To facilitate subsequent transfers, all DTC Notes deposited by Participants with DTC are registered in the name of DTC’s partnership nominee, Cede & Co. The deposit of DTC Notes with DTC and their registration in the name of Cede & Co. effect no change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the DTC Notes; DTC’s records reflect only the identity of the Direct Participants to whose accounts such DTC Notes are credited, which may or may not be the Beneficial Owners. The Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time.

Redemption notices shall be sent to Cede & Co. If less than all of the DTC Notes within an issue are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such issue to be redeemed.

Neither DTC nor Cede & Co. will consent or vote with respect to DTC Notes. Under its usual procedures, DTC mails an Omnibus Proxy to the relevant Issuer as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the DTC Notes are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal and interest payments on the DTC Notes will be made to DTC. DTC's practice is to credit Direct Participants' accounts on the due date for payment in accordance with their respective holdings shown on DTC's records unless DTC has a reason to believe that it will not receive payment on the due date. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities registered in "street name," and will be the responsibility of such Participant and not of DTC, the Issuers, or the Guarantor subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal and interest to DTC is the responsibility of the relevant Issuer (failing which, in the case of Guaranteed Notes, the Guarantor), disbursement of such payments to Direct Participants is the responsibility of DTC, and disbursement of such payments to the Beneficial Owners is the responsibility of Direct and Indirect Participants.

Under certain circumstances, including if there is an Event of Default under the Notes, DTC will exchange the DTC Notes for definitive Notes, which it will distribute to its Participants in accordance with their proportionate entitlements and which, if representing interests in a Rule 144A Global Certificate, will be legended as set forth under "*Transfer Restrictions*."

Since DTC may only act on behalf of Direct Participants, who in turn act on behalf of Indirect Participants, any Owner desiring to pledge DTC Notes to persons or entities that do not participate in DTC, or otherwise take actions with respect to such DTC Notes, will be required to withdraw its Notes from DTC as described below.

#### ***Euroclear and Clearstream***

Euroclear and Clearstream each hold securities for its customers and facilitate the clearance and settlement of securities transactions by electronic book-entry transfer between their respective account holders. Euroclear and Clearstream provide various services including safekeeping, administration, clearance and settlement of internationally traded securities and securities lending and borrowing. Euroclear and Clearstream also deal with domestic securities markets in several countries through established depository and custodial relationships. Euroclear and Clearstream have established an electronic bridge between their two systems across which their respective participants may settle trades with each other.

Euroclear and Clearstream customers are world-wide financial institutions, including underwriters, securities brokers and dealers, banks, trust companies and clearing corporations. Indirect access to Euroclear and Clearstream is available to other institutions that clear through or maintain a custodial relationship with an account holder of either system.

#### ***Book-entry Ownership of and Payments in respect of DTC Notes***

The relevant Issuer may apply to DTC in order to have any Series of Notes represented by a Global Note Certificate accepted in its book-entry settlement system. Upon the issue of any such Global Note Certificate, DTC or its custodian will credit, on its internal book-entry system, the respective nominal amounts of the individual beneficial interests represented by such Global Note Certificate to the accounts of persons who have accounts with DTC. Such accounts initially will be designated by or on behalf of the relevant Dealer. Ownership of beneficial interests in such a Global Note Certificate will be limited to Direct Participants or Indirect Participants, including, in the case of any Regulation S Global Note, the respective depositories of Euroclear and Clearstream. Ownership of beneficial interests in a Global Note Certificate accepted by DTC will be shown on, and the transfer of such ownership will be effected only through, records maintained by DTC or its nominee (with respect to the interests of Direct Participants) and the records of Direct Participants (with respect to interests of Indirect Participants).

Payments in U.S. dollars of principal and interest in respect of a Global Note Certificate accepted by DTC will be made to the order of DTC or its nominee as the registered holder of such Note. In the case of any



payment in a currency other than U.S. dollars, payment will be made to the Exchange Agent on behalf of DTC or its nominee and the Exchange Agent will (in accordance with instructions received by it) remit all or a portion of such payment for credit directly to the beneficial holders of interests in the Global Note Certificate in the currency in which such payment was made and/or cause all or a portion of such payment to be converted into U.S. dollars and credited to the applicable Participants' account.

The Issuers expect DTC to credit accounts of Direct Participants on the applicable payment date in accordance with their respective holdings as shown in the records of DTC unless DTC has reason to believe that it will not receive payment on such payment date. The Issuers also expect that payments by Participants to beneficial owners of Notes will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers, and will be the responsibility of such Participant and not the responsibility of DTC, the Principal Paying Agent, the Registrar, the Issuers or the Guarantor. Payment of principal, premium, if any, and interest, if any, on Notes to DTC is the responsibility of the relevant Issuer (failing which, in the case of Guaranteed Notes, the Guarantor).

### ***Transfers of Notes Represented by Global Notes Certificate***

Transfers of any interests in Notes represented by a Global Note Certificate within DTC, Euroclear and Clearstream will be effected in accordance with the customary rules and operating procedures of the relevant clearing system. The laws in some States within the United States require that certain persons take physical delivery of securities in definitive form. Consequently, the ability to transfer Notes represented by a Global Note Certificate to such persons may depend upon the ability to exchange such Notes for Notes in definitive form. Similarly, because DTC can only act on behalf of Direct Participants in the DTC system who in turn act on behalf of Indirect Participants, the ability of a person having an interest in Notes represented by a Global Note Certificate accepted by DTC to pledge such Notes to persons or entities that do not participate in the DTC system or otherwise to take action in respect of such Notes may depend upon the ability to exchange such Notes for Notes in definitive form. The ability of any holder of Notes represented by a Global Note Certificate accepted by DTC to resell, pledge or otherwise transfer such Notes may be impaired if the proposed transferee of such Notes is not eligible to hold such Notes through a direct or indirect participant in the DTC system.

Subject to compliance with the transfer restrictions applicable to the Notes described under “*Transfer Restrictions*,” cross-market transfers between DTC, on the one hand, and directly or indirectly through Clearstream or Euroclear accountholders, on the other, will be effected by the relevant clearing system in accordance with its rules and through action taken by the Registrar, the Paying Agent and the DTC Custodian with whom the relevant Notes have been deposited.

On or after the Issue Date for any Series, transfers of Notes of such Series between accountholders in Clearstream and Euroclear and transfers of Notes of such Series between Participants in DTC will generally have a settlement date three business days after the trade date (T+3). The customary arrangements for delivery versus payment will apply to such transfers.

Cross-market transfers between accountholders in Clearstream or Euroclear and DTC participants will need to have an agreed settlement date between the parties to such transfer. Because there is no direct link between DTC, on the one hand, and Clearstream and Euroclear, on the other, transfers of interests in the relevant Registered Global Notes will be effected through the Registrar, the Paying Agent and the DTC Custodian receiving instructions (and, where appropriate, certification) from the transferor and arranging for delivery of the interests being transferred to the credit of the designated account for the transferee. In the case of cross-market transfers, settlement between Euroclear or Clearstream accountholders and DTC participants cannot be made on a delivery versus payment basis. The securities will be delivered on a free delivery basis and arrangements for payment must be made separately.

DTC, Clearstream and Euroclear have each published rules and operating procedures designed to facilitate transfers of beneficial interests in Notes among participants and accountholders of DTC, Clearstream and Euroclear. However, they are under no obligation to perform or continue to perform such procedures, and such procedures may be discontinued or changed at any time. None of the Issuers, the Guarantor, the Agents or any Dealer will be responsible for any performance by DTC, Clearstream or Euroclear or their respective direct or indirect participants or accountholders of their respective obligations under the rules and procedures governing their operations and none of them will have any liability for any aspect of the records relating to or payments made on account of beneficial interests in the Notes represented by Global Notes Certificate or for maintaining, supervising or reviewing any records relating to such beneficial interests.

## SUBSCRIPTION AND SALE

### Summary of Dealer Agreement

The Dealers have, in an amended and restated dealer agreement dated March 4, 2021 (the “**Dealer Agreement**”), agreed with the Issuers and the Guarantor a basis upon which they or any of them may from time to time agree to severally, and not jointly, purchase Notes. Any such agreement will extend to those matters stated under “*Form of the Notes*” and “*Terms and Conditions of the Notes*.” The relevant Issuer will pay each relevant Dealer a commission as agreed between them in respect of Notes purchased by it. Where the relevant Issuer agrees to sell to the Dealer(s), who agree to purchase and pay for, or to procure purchasers to purchase and pay for, Notes at an issue price (the “**Issue Price**”), any subsequent offering of those Notes to investors may be at a price different from such Issue Price. The Issuers are responsible for the payment of certain of the expenses incurred in connection with the establishment, and maintenance of the Program and certain other activities in connection with the Program. The commissions in respect of an issue of Notes on a syndicated basis may be stated in the relevant Pricing Supplement.

The Issuers and the Guarantor have agreed to indemnify the Dealers against certain liabilities in connection with the offer and sale of the Notes. The Dealer Agreement entitles the Dealers to terminate any agreement that they make to purchase Notes in certain circumstances prior to payment for such Notes being made to the Issuer.

In connection with the issue of any Series of Notes, the Stabilizing Manager may over-allot Notes or effect transactions with a view to supporting the price of the Notes at a level higher than that which might otherwise prevail for a limited period after the issue date of the Notes. However, there is no obligation on such Stabilizing Manager(s) to do this. Such stabilizing, if commenced, may be discontinued at any time, and must be brought to an end after a limited period. Such stabilizing shall be in compliance with all applicable laws, regulations and rules.

In connection with each Series of Notes issued under the Program, the Dealers or certain of their affiliates may purchase Notes and be allocated Notes for asset management and/or proprietary purposes but not with a view to distribution. Further, the Dealers or their respective affiliates may purchase Notes for its or their own account and enter into transactions, including credit derivatives, such as asset swaps, repackaging and credit default swaps relating to such Notes and/or other securities of the Issuers, the Guarantor or their respective subsidiaries or affiliates at the same time as the offer and sale of each Series of Notes or in secondary market transactions. Such transactions would be carried out as bilateral trades with selected counterparties and separately from any existing sale or resale of the Series of Notes to which a particular Pricing Supplement relates (notwithstanding that such selected counterparties may also be purchasers of such Series of Notes).

The Dealers and their affiliates are full service financial institutions engaged in various activities which may include securities trading, commercial and investment banking, financial advice, investment management, principal investment, hedging, financing and brokerage activities. Each of the Dealers may have engaged in, and may in the future engage in, investment banking and other commercial dealings in the ordinary course of business with the Issuers, the Guarantor or their subsidiaries, joint ventures or associated companies from time to time. In the ordinary course of their various business activities, the Dealers and their affiliates may make or hold (on their own account, on behalf of clients or in their capacity of investment advisers) a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers and may at any time hold long and short positions in such securities and instruments and enter into other transactions, including credit derivatives (such as asset swaps, repackaging and credit default swaps) in relation thereto. Such transactions, investments and securities activities may involve securities and instruments of the Issuers, the Guarantor or their subsidiaries, joint ventures or associated companies, including Notes issued under the Program, may be entered into at the same time or proximate to offers and sales of Notes or at other times in the secondary market and be carried out with counterparties that are also purchasers, holders or sellers of Notes. Notes issued under the Program may be purchased by or be allocated to any Dealer or an affiliate for asset management and/or proprietary purposes but not with a view to distribution.

If a jurisdiction requires that the offering be made by a licensed broker or dealer and a Dealer or any affiliate of that Dealer is a licensed broker or dealer in that jurisdiction, the offering shall be deemed to be made by that Dealer or such affiliate on behalf of the relevant Issuer (as defined in this Offering Memorandum) in such jurisdiction.

## Selling Restrictions

### *United States of America*

The Notes have not been and will not be registered under the Securities Act and may not be offered or sold within the United States or to, or for the account or benefit of, U.S. persons (as defined in Regulation S) except pursuant to an exemption from, or in a transaction not subject to, the registration requirements of the Securities Act.

### *Compliance with United States securities laws*

(a) *Offers/sales only in accordance with Regulation S:* In relation to each Tranche of Notes issued in reliance on Regulation S under the Securities Act:

(i) the Notes and the Guarantee have been offered and sold, and will be offered and sold:

(A) as part of their distribution, at any time; and

(B) *otherwise*, until 40 days after the issue date in respect of the relevant Notes (the period described herein as “**distribution compliance period**”);

only in accordance with Rule 903 of Regulation S under the Securities Act and, accordingly, that

(A) neither it nor any of its affiliates (including any person acting on behalf of a Dealer or any of its affiliates) has engaged or will engage in any directed selling efforts with respect to the Notes and the Guarantee; and

(B) it and its affiliates have complied and will comply with Regulation S under the Securities Act; and

(ii) *Prescribed form of confirmation:* At or prior to confirmation of sale, each distributor, dealer or person receiving a selling concession, fee or other remuneration which purchases Notes from a Dealer during the distribution compliance period will receive a confirmation or notice in substantially the following form:

“The Securities covered hereby have not been and will not be registered under the United States Securities Act of 1933, as amended, (the “**Securities Act**”) and may not be offered or sold within the United States or to, or for the account or benefit of, U.S. persons (as defined in Regulation S), (a) as part of their distribution at any time or (b) otherwise until 40 days after the completion of the distribution of the Tranche of Notes of which such Notes are a part, as determined by [Name of Dealer or Dealers, as the case may be], except in either case pursuant to a valid exemption from registration in accordance with Regulation S or Rule 144A under the Securities Act.”;

(iii) *Completion of distribution:* Each Dealer, which has purchased Notes of such Tranche in accordance with the related subscription agreement, shall determine and certify to the Principal Paying Agent or the Issuer the completion of the distribution of the Notes of such Tranche purchased by it. In the case of a subscription agreement between the relevant Issuer, (in respect of each Series of Guaranteed Notes) the Guarantor and more than one Dealer, the Principal Paying Agent, the relevant Issuer or (in respect of each Series of Guaranteed Notes) the Guarantor shall notify each relevant Dealer when all relevant Dealers have certified as provided in this paragraph. In order to facilitate compliance by each Dealer with the foregoing, the Issuers and (in respect of each Series of Guaranteed Notes) the Guarantor undertake that, prior to such certification with respect to such Tranche, it will notify each Dealer in writing of each acceptance by the relevant Issuer of an offer to purchase and of any issuance of, Notes or other debt obligations of the relevant Issuer which are denominated in the same currency or composite currency and which have substantially the same interest rate and maturity date as the Notes of such Tranche;

- (b) In relation to each Tranche of Notes issued in reliance on Rule 144A under the Securities Act:
- (i) each Dealer may directly or through their respective affiliates arrange for the placing of Restricted Notes in the United States to qualified institutional buyers (as *defined* in Rule 144A under the Securities Act) pursuant to Rule 144A under the Securities Act and in accordance with the provisions of the Dealer Agreement, provided that each person to whom Restricted Notes are offered or sold is, or such Dealer reasonably believes each such person to be a qualified institutional buyer as defined under Rule 144A and a qualified purchaser as defined under the U.S. Investment Company Act purchasing for its own account or for the account of a qualified institutional buyer as defined under Rule 144A and a qualified purchaser as defined under the U.S. Investment Company Act and provided further that the aggregate principal amount of Restricted Notes sold by such Dealer to each qualified institutional buyer and qualified purchaser pursuant to this paragraph is not less than US\$200,000 (or its equivalent in other currencies). In addition, the affiliate through which the mandated Dealer arranges for the placing of Restricted Notes in the United States or (as the case may be) such other Dealer or its affiliate shall be a U.S. broker-dealer that is registered under the Exchange Act;
  - (ii) neither the Issuer nor the Guarantor have been, and they will not be, registered under the U.S. Investment Company Act, and investors will not be entitled to the benefits of the U.S. Investment Company Act. The Issuer is relying on the exemption from the registration requirements of the U.S. Investment Company Act provided by Section 3(c)(7) of that Act, and as a result the Notes may only be purchased within the United States by persons who are both qualified institutional buyers as defined in Rule 144A and qualified purchasers as defined in the U.S. Investment Company Act; and
  - (iii) no Dealer nor any of its affiliates (including any person acting on behalf of such Dealer or any of its affiliates) has solicited or will solicit any offer to buy or offer to sell the Notes by any form of general solicitation or general advertising (as those terms are used in Rule 502(c) under the Securities Act) in the United States.

#### ***Interpretation***

Terms used in the paragraph “*Compliance with United States securities laws*” have the meanings given to them by Regulation S under the Securities Act.

#### ***Index-, commodity- or currency-linked Notes***

Each issuance of index-, commodity- or currency-linked Notes shall be subject to additional U.S. selling restrictions.

#### **European Economic Area**

Unless the Pricing Supplement in respect of any Notes specifies the “Prohibition of Sales to EEA Retail Investors” as “Not Applicable,” each Dealer has represented and agreed, and each further Dealer appointed under the Program will be required to represent and agree, that it will not have offered, sold or otherwise made available and will not offer, sell or otherwise make available any Notes which are the subject of the offering contemplated by the Offering Memorandum as completed by the Pricing Supplement in relation thereto to any retail investor in the European Economic Area. For the purposes of this provision:

- (a) the expression “**retail investor**” means a person who is one (or more) of the following:
  - (i) a retail client as defined in point (11) of Article 4(1) of Directive 2014/65/EU (as amended, “**MiFID II**”); or
  - (ii) a customer within the meaning of Directive (EU) 2016/97 (the “**Insurance Distribution Directive**”), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or
  - (iii) not a qualified investor as defined in Regulation (EU) 2017/1129 (the “**Prospectus Regulation**”); and

- (b) the expression an “**offer**” includes the communication in any form and by any means of sufficient information on the terms of the offer and the Notes to be offered so as to enable an investor to decide to purchase or subscribe the Notes.

If the Pricing Supplement in respect of any Notes specifies “Prohibition of Sales to EEA Retail Investors” as “Not Applicable,” in relation to each Member State of the European Economic Area (each, a “**Member State**”), each Dealer has represented and agreed, and each further Dealer appointed under the Program will be required to represent and agree, that it has not made and will not make an offer of Notes which are the subject of an offering contemplated by this Offering Memorandum as completed by the Pricing Supplement in relation thereto to the public in that Member State except that it may be made to the public in that Member State:

- (a) *Approved prospectus*: If the Pricing Supplement in relation to the Notes specify that an offer of those Notes may be made other than pursuant to Article 1(4) of the Prospectus Regulation in that Member State (a “**Non-exempt Offer**”), following the date of publication of a prospectus in relation to such Notes which has been approved by the competent authority in that Member State or, where appropriate, approved in another Member State and notified to the competent authority in that Member State, provided that any such prospectus has subsequently been completed by the Pricing Supplement contemplating such Non-exempt Offer, in accordance with the Prospectus Regulation, in the period beginning and ending on the dates specified in such prospectus or Pricing Supplement, as applicable and the Issuer has consented in writing to its use for the purpose of that Non-exempt Offer;
- (b) *Qualified Investors*: At any time to any legal entity which is a qualified investor as defined in the Prospectus Regulation;
- (c) *Fewer than 150 offerees*: At any time to fewer than 150, natural or legal persons (other than qualified investors as defined in the Prospectus Regulation) subject to obtaining the prior consent of the relevant Dealer or Dealers nominated by the Issuer for any such offer; or
- (d) *Other exempt offers*: At any time in any other circumstances falling within Article 1(4) of the Prospectus Regulation.

**provided that** no such offer of Notes referred to in (b) to (d) above shall require the Issuer or any Dealer to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation.

For the purposes of this provision the expression “**an offer of Notes to the public**” in relation to any Notes in any Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the Notes to be offered so as to enable an investor to decide to purchase or subscribe for the Notes.

## **United Kingdom**

### ***Prohibition of Sales to UK Retail Investors***

Unless the Pricing Supplement in respect of any Notes specifies “Prohibition of Sales to UK Retail Investors” as “Not Applicable”, each Dealer has represented and agreed, and each further Dealer appointed under the Programme will be required to represent and agree, that it has not offered, sold or otherwise made available and will not offer, sell or otherwise make available any Notes which are the subject of the offering contemplated by this Offering Memorandum as completed by the Pricing Supplement in relation thereto to any retail investor in the United Kingdom. For the purposes of this provision:

- (a) the expression “retail investor” means a person who is one (or more) of the following:
- (i) a retail client, as defined in point (8) of Article 2 of Regulation (EU) No 2017/565 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018 (“EUWA”); or
- (ii) a customer within the meaning of the provisions of the FSMA and any rules or regulations made under the FSMA to implement Directive (EU) 2016/97, where that customer would not qualify as a professional client, as defined in point (8) of Article 2(1) of Regulation (EU) No 600/2014 as it forms part of domestic law by virtue of the EUWA; or

- (iii) not a qualified investor as defined in Article 2 of Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA; and
- (b) the expression an "offer" includes the communication in any form and by any means of sufficient information on the terms of the offer and the Notes to be offered so as to enable an investor to decide to purchase or subscribe for the Notes.

If the Pricing Supplement in respect of any Notes specifies "Prohibition of Sales to UK Retail Investors" as "Not Applicable", each Dealer has represented and agreed, and each further Dealer appointed under the Programme will be required to represent and agree, that it has not made and will not make an offer of Notes which are the subject of the offering contemplated by this Offering Memorandum as completed by the final terms in relation thereto to the public in the United Kingdom except that it may make an offer of such Notes to the public in the United Kingdom:

- (a) if the final terms in relation to the Notes specify that an offer of those Notes may be made other than pursuant to section 86 of the FSMA (a "Public Offer"), following the date of publication of a prospectus in relation to such Notes which either (i) has been approved by the Financial Conduct Authority, or (ii) is to be treated as if it had been approved by the Financial Conduct Authority in accordance with the transitional provision in Regulation 74 of the Prospectus (Amendment etc.) (EU Exit) Regulations 2019, provided that any such prospectus has subsequently been completed by final terms contemplating such Public Offer, in the period beginning and ending on the dates specified in such prospectus or final terms, as applicable, and the Issuer has consented in writing to its use for the purpose of that Public Offer;
- (b) at any time to any legal entity which is a qualified investor as defined in Article 2 of Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA;
- (c) at any time to fewer than 150 natural or legal persons (other than qualified investors as defined in Article 2 of Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA) in the United Kingdom subject to obtaining the prior consent of the relevant Dealer or Dealers nominated by the Issuer for any such offer; or
- (d) at any time in any other circumstances falling within section 86 of the FSMA,

provided that no such offer of Notes referred to in (b) to (d) above shall require the Issuer or any Dealer to publish a prospectus pursuant to section 85 of the FSMA or supplement a prospectus pursuant to Article 23 of Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA.

For the purposes of this provision, the expression "**an offer of Notes to the public**" in relation to any Notes means the communication in any form and by any means of sufficient information on the terms of the offer and the Notes to be offered so as to enable an investor to decide to purchase or subscribe for the Notes and the expression "**UK Prospectus Regulation**" means Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA.

#### ***Other regulatory restrictions***

- (a) *No deposit-taking*: in relation to any Notes having a maturity of less than one year:
  - (i) each Dealer shall be a person whose ordinary activities involve it in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of its business; and
  - (ii) Notes may only be sold to persons:
    - (A) whose ordinary activities involve them in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of their businesses; or
    - (B) who it is reasonable to expect will acquire, hold, manage or dispose of investments (as principal or agent) for the purposes of their businesses, where the issue of the Notes would otherwise constitute a contravention of Section 19 of the FSMA by the Issuers or the Guarantor.

- (b) *Financial promotion*: No communication or invitation or inducement to engage in investment activity (within the meaning of section 21 of the FSMA) in connection with the issue or sale of any Notes will be made in circumstances in which section 21(1) of the FSMA does not apply to the Issuers or the Guarantor.
- (c) *General compliance*: all applicable provisions of the FSMA with respect to anything done by it in relation to any Notes in, from or otherwise involving the United Kingdom shall be complied with.

### **People's Republic of China (PRC)**

No Notes may be offered or sold in the PRC (excluding Hong Kong, Macau and Taiwan) as part of the initial distribution of the Notes.

### **Hong Kong**

Each Dealer has represented and agreed that:

(1) it has not offered or sold and will not offer or sell in Hong Kong, by means of any document, any Notes other than (a) to “professional investors” as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong (the “SFO”) and any rules made under the SFO; or (b) in other circumstances which do not result in the document being a “prospectus” as defined in the Companies (Winding Up and Miscellaneous Provisions Ordinance (Cap. 32) of Hong Kong (the “C(WUMP)O”) or which do not constitute an offer to the public within the meaning of the C(WUMP)O; and

(2) it has not issued or had in its possession for the purposes of issue, and will not issue or have in its possession for the purposes of issue, whether in Hong Kong or elsewhere, any advertisement, invitation or document relating to the Notes, which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to Notes which are or are intended to be disposed of only to persons outside Hong Kong or only to “professional investors” as defined in the SFO and any rules made under the SFO.

### **Japan**

The Notes have not been and will not be registered under the Financial Instruments and Exchange Act of Japan (Act no. 25 of 1948, as amended) (the “**Financial Instruments and Exchange Act**”). Accordingly, no Notes to be issued by an Issuer under this Program will, directly or indirectly, be offered or sold in Japan or to, or for the benefit of, any resident of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan) or to others for re-offering or re-sale, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Act and any other relevant laws and regulations of Japan.

### **Singapore**

Each Dealer has acknowledged and each further Dealer appointed under the Program will be required to acknowledge that this Offering Memorandum has not been and will not be registered as a prospectus with the Monetary Authority of Singapore. Accordingly, each Dealer has represented, warranted and agreed that, and each further Dealer appointed under the Program will be required to represent, warrant and agree that it has not offered or sold any Notes or caused the Notes to be made the subject of an invitation for subscription or purchase and will not offer or sell any Notes or cause the Notes to be made the subject of an invitation for subscription or purchase and has not circulated or distributed, nor will it circulate or distribute, this Offering Memorandum and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the Notes, whether directly or indirectly, to any person in Singapore other than (i) to an institutional investor (as defined in Section 4A of the Securities and Futures Act (Chapter 289 of Singapore) (the “SFA”)) pursuant to Section 274 of the SFA, (ii) to a relevant person (as defined in Section 275(2) of the SFA) pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA and (where applicable) Regulation 3 of the Securities and Futures (Classes of Investors) Regulations 2018, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the Notes are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

- (a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or
- (b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities or securities-based derivatives contracts (each term as defined in Section 2(1) of the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the Notes pursuant to an offer made under Section 275 of the SFA except:

- (i) to an institutional investor or to a relevant person defined in the SFA, or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(i)(B) of the SFA;
- (ii) where no consideration is or will be given for the transfer;
- (iii) where the transfer is by operation of law;
- (iv) as specified in Section 276(7) of the SFA; or
- (v) as specified in Regulation 37A of the Securities and Futures (Offers of Investments) (Securities and Securities-based Derivatives Contracts) Regulations 2018 of Singapore.

#### **Thailand**

(i) No Notes may be offered or sold, whether directly or indirectly, in Thailand; (ii) no person will make, whether directly or indirectly, any invitation in Thailand to subscribe for the Notes; and (iii) no person will circulate or distribute this Offering Memorandum or any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of Notes, whether directly or indirectly, in Thailand.

#### **General**

These selling restrictions may be modified by the agreement of each of the Issuers, the Guarantor and the Dealers following a change in a relevant law, regulation or directive. Any such modification will be set out in the relevant Pricing Supplement issued in respect of the issue of the Notes to which it relates or in a supplement to this Offering Memorandum.



## TRANSFER RESTRICTIONS

### Thailand

By accepting delivery of this Offering Memorandum and the Notes, the holders of the Notes will be deemed to have agreed for the benefit of the Issuers and the Guarantor that the Notes may not, either directly or indirectly, be resold, pledged, or otherwise transferred in Thailand.

### United States

*The Notes may not be offered or sold within the United States or to, or for the account or benefit of, U.S. persons (as defined in Regulation S) except (i) in reliance on Rule 144A to persons who are both qualified institutional buyers and qualified purchasers and (ii) outside the United States to non-U.S. persons in offshore transactions in reliance on Regulation S.*

#### *Regulation S Notes*

Each purchaser of or Unrestricted Notes outside the United States pursuant to Regulation S and each subsequent purchaser of such Notes in resales prior to the expiration of the distribution compliance period, by accepting delivery of this Offering Memorandum and the Notes, will be deemed to have represented, agreed and acknowledged that:

- (i) it is, or at the time Notes are purchased will be, the beneficial owner of such Notes and:
  - (a) it is not a U.S. person and it is located outside the United States (within the meaning of Regulation S); andit is not an affiliate of the Issuers, the Guarantor or a person acting on behalf of such an affiliate;
- (ii) it understands that such Notes have not been and will not be registered under the Securities Act and that, prior to the expiration of the distribution compliance period (as defined in Regulation S) it will not offer, sell, pledge or otherwise transfer such Notes except:
  - (a) in an offshore transaction in accordance with Rule 903 or Rule 904 of Regulation S;
  - (b) to the Issuers or the Guarantor; or
  - (c) in the case of Unrestricted Notes only, in accordance with Rule 144A to a person that it and any person acting on its behalf reasonably believe is a both a QIB and a QP purchasing for its own account or the account of a person that is both a QIB and a QP,in each case in accordance with any applicable securities laws of any state of the United States;
- (iii) it understands that the Issuers, the Guarantor, the Principal Paying Agent, the Registrar, the Dealers and their affiliates, and others will rely upon the truth and accuracy of the foregoing acknowledgements, representations and agreements.

On or prior to the fortieth day after the relevant issue date, Notes represented by an interest in an Unrestricted Global Note Certificate may be transferred to a person who wishes to hold such Notes in the form of an interest in a Restricted Global Note Certificate only upon receipt by the Registrar of a written certification from the transferor to the effect that such transfer is being made to a person whom the transferor reasonably believes is both a QIB and a QP, in a transaction meeting the requirements of Rule 144A and in accordance with any applicable securities laws of any state of the United States. After such fortieth day, such certification requirements will no longer apply to such transfers, but such transfers will continue to be subject to the transfer restrictions contained in the legend appearing on the face of such Global Note Certificate, as described above under “*Form of the Notes.*”

Notes represented by an interest in a Restricted Global Note Certificate may also be transferred to a person who wishes to hold such Notes in the form of an interest in an Unrestricted Global Note Certificate, but only upon receipt by the Registrar of a written certification from the transferor to the effect that such transfer is being made in accordance with Regulation S or Rule 144 (if available) under the Securities Act.

Any interest in a Note represented by an Unrestricted Global Note Certificate that is transferred to a person who takes delivery in the form of an interest in a Note represented by a Restricted Global Note Certificate will, upon transfer, cease to be an interest in a Note represented by an Unrestricted Global Note Certificate and become an interest in a Note represented by a Restricted Global Note Certificate and, accordingly, will thereafter be subject to all transfer restrictions and other procedures applicable to Notes represented by a Restricted Global Note Certificate.

#### ***Rule 144A Notes***

Each purchaser of Restricted Notes in reliance on Rule 144A, by accepting delivery of this Offering Memorandum, will be deemed to have represented, agreed and acknowledged as follows (terms used in the following paragraphs that are defined in Rule 144A have the respective meanings given to them in Rule 144A):

- (i) the purchaser is both (a) a QIB and a QP, (b) acquiring the Notes for its own account or for the account of one or more persons who are both a QIB and a QP, (c) not formed for the purpose of investing in the Notes or the relevant Issuer and (d) is aware, and each beneficial owner of such Notes has been advised that the sale of the Notes to it is being made in reliance on Rule 144A;
- (ii) the purchaser understands that (1) the Notes have not been and will not be registered under the Securities Act and may not be offered, sold, pledged or otherwise transferred except (a) in accordance with Rule 144A to a person that it, and any person acting on its behalf, reasonably believes is both a QIB and a QP purchasing for its own account or for the account of one or more persons who are both a QIB and a QP, (b) in an offshore transaction in accordance with Rule 903 or Rule 904 of Regulation S under the Securities Act, (c) pursuant to an exemption from registration under the Securities Act provided by Rule 144 thereunder (if available), (d) pursuant to an effective registration statement under the Securities Act or (e) to the Issuers, the Guarantor or any of their affiliates, in each case in accordance with any applicable securities laws of any State of the United States and (2) it will, and each subsequent holder of the Restricted Notes is required to, notify any purchaser of the Restricted Notes from it of the resale restrictions applicable to the Restricted Notes;
- (iii) the purchaser understands that the Restricted Global Note Certificate and any restricted Individual Note Certificate (a “**Restricted Individual Note Certificate**”) will bear a legend to the following effect, unless the relevant Issuer determines otherwise in accordance with applicable law:

THE NOTES REPRESENTED HEREBY HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER THE UNITED STATES SECURITIES ACT OF 1933, AS AMENDED (THE “**SECURITIES ACT**”) OR ANY SECURITIES LAW OF ANY STATE OF THE UNITED STATES. THE HOLDER HEREOF, BY PURCHASING THE NOTES REPRESENTED HEREBY, AGREES FOR THE BENEFIT OF THE ISSUER [AND THE GUARANTOR] THAT THE NOTES REPRESENTED HEREBY MAY BE REOFFERED, RESOLD, PLEDGED OR OTHERWISE TRANSFERRED ONLY IN COMPLIANCE WITH THE SECURITIES ACT AND OTHER APPLICABLE LAWS. AND ONLY (1) PURSUANT TO RULE 144A UNDER THE SECURITIES ACT TO A PERSON THAT THE HOLDER REASONABLY BELIEVES IS BOTH A QUALIFIED INSTITUTIONAL BUYER WITHIN THE MEANING OF RULE 144A AND A “QUALIFIED PURCHASER” (AS DEFINED IN SECTION 2(A)(51) OF THE U.S. INVESTMENT COMPANY ACT OF 1940, AS AMENDED) PURCHASING FOR ITS OWN ACCOUNT OR A PERSON PURCHASING FOR THE ACCOUNT OF A QUALIFIED INSTITUTIONAL BUYER WHOM THE HOLDER HAS INFORMED, IN EACH CASE, THAT THE REOFFER, RESALE, PLEDGE OR OTHER TRANSFER IS BEING MADE IN RELIANCE ON RULE 144A, (2) IN AN OFFSHORE TRANSACTION IN ACCORDANCE WITH RULE 903 OR 904 OF REGULATION S UNDER THE SECURITIES ACT OR (3) TO THE ISSUER, [THE GUARANTOR] OR [ITS/THEIR] AFFILIATES.

- (iv) if it is acquiring any Notes for the account of one or more persons who are both a QIB and a QP, the purchaser represents that it has sole investment discretion with respect to each such account and that it has full power to make the foregoing acknowledgements, representations and agreements on behalf of each such account; and

- (v) the purchaser understands that the Issuers, the Guarantor, the Principal Paying Agent, the Registrar, the Dealers and their affiliates, and others will rely upon the truth and accuracy of the foregoing acknowledgements, representations and agreements.

By purchasing or accepting a subsequent transfer of Notes (or a beneficial interest therein), you will be deemed to have made the following acknowledgements, representations to and agreements with the Company:

- (i) if you are a U.S. person (as defined in Regulation S), you represent that:
  - (A) you are not a broker-dealer who owns and invests on a discretionary basis less than US\$25,000,000 in securities of unaffiliated issuers;
  - (B) you are not a participant-directed employee plan, such as a 401(k) plan, or a trust holding the assets of such a plan;
  - (C) you were not formed, reformed or recapitalized for the specific purpose of investing in the Notes and/or other securities of the Issuer, unless all of the beneficial owners of your securities are both QIBs and QPs;
  - (D) if you are an investment company excepted from the U.S. Investment Company Act pursuant to Section 3(c)(1) or Section 3(c)(7) thereof and were formed on or before April 30, 1996, you have received the consent of your beneficial owners who acquired their interests on or before April 30, 1996, with respect to your treatment as a qualified purchaser in the manner required by Section 2(a)(51)(C) of the U.S. Investment Company Act and the rules promulgated thereunder;
  - (E) you are not a partnership; common trust fund; or corporation, special trust, pension fund or retirement plan, or other entity, in which the partners, beneficiaries, beneficial owners, participants, shareholders or other equity owners, as the case may be, may designate the particular investment to be made, or the allocation thereof, unless all such partners, beneficiaries, beneficial owners, participants, shareholders or other equity owners are both QIBs and QPs; and
  - (F) you have not invested more than 40% of your assets in the Notes (or beneficial interests therein) and/or other securities of the Issuer after giving effect to the purchase of the Notes (or beneficial interests therein) (unless all of the beneficial owners of your securities are both QIBs and QPs).
- (ii) you understand and acknowledge that the Notes (or any interest therein) may be purchased, sold, pledged or otherwise transferred only in minimum principal amounts of US\$200,000 and integral multiples of US\$1,000 in excess thereof; and
- (iii) you understand and acknowledge that if your purchase of the Notes, or any sale or transfer of the Notes (or a beneficial interest therein) to any other person, does not comply with the requirements set forth in these "Transfer Restrictions," such transaction may, at the discretion of the Issuer, be considered void and of no effect. The Issuer may compel you or such other person to sell or transfer, as applicable, such Notes (or such beneficial interest), within 30 days after notice of the sale requirement is given, to a person acceptable to the Issuer who is able to, and who does make, all of the representations and agreements set forth herein. If you fail to effect the sale or transfer, as applicable, within such 30-day period, the Issuer has the right, without further notice to you, to compel you to sell or transfer, as applicable, such Notes (or such beneficial interest) to a purchaser selected by the Issuer who meets the requirements set forth hereunder on such terms as the Issuer may choose. The Issuer may select the purchaser by soliciting one or more bids from one or more brokers or other market professionals that regularly deal in securities similar to the Notes, and selling such Notes to the highest such bidder. However, the Issuer may select a purchaser by any other means determined by the Issuer in its sole discretion.

Upon the transfer, exchange or replacement of a Restricted Global Note Certificate or a Restricted Individual Note Certificate, or upon specific request for removal of the legend, the relevant Issuer will deliver only a Restricted Global Note Certificate or one or more Restricted Individual Note Certificates that bear such legend or will refuse to remove such legend, unless there is delivered to the relevant Issuer, (in respect of each

Series of Guaranteed Notes) the Guarantor, and the Registrar such satisfactory evidence (which may include a legal opinion) as may reasonably be required by the relevant Issuer or (in respect of each Series of Guaranteed Notes) the Guarantor, that neither the legend nor the restrictions on transfer set forth therein are required to ensure compliance with the provisions of the Securities Act.

Any interest in a Restricted Global Note Certificate that is transferred to a person who takes delivery in the form of an interest in an Unrestricted Global Note Certificate will, upon transfer, cease to be an interest in a Restricted Global Note Certificate and become an interest in an Unrestricted Global Note Certificate and, accordingly, will thereafter be subject to all transfer restrictions and other procedures applicable to an interest in an Unrestricted Global Note Certificate.

**Prospective purchasers are hereby notified that sellers of the Restricted Notes may be relying on the exemption from the provisions of Section 5 of the Securities Act provided by Rule 144A.**

## ERISA CONSIDERATIONS

The following is a summary of certain considerations associated with the purchase and holding of the Direct Issuance Notes by employee benefit plans that are subject to Title I of the Employee Retirement Income Security Act of 1974, as amended (“**ERISA**”), plans, individual retirement accounts (“**IRAs**”) and other arrangements that are subject to Section 4975 of the Code or provisions under any federal, state, local, non-U.S. or other laws or regulations that are similar to such provisions of ERISA or the Code (collectively, “**Similar Laws**”), and entities whose underlying assets are considered to include “plan assets” (within the meaning of 29 C.F.R. 2510.3-101, as modified by Section 3(42) of ERISA, and any Similar Laws) of such plans, accounts and arrangements (each, a “**Plan**”).

### General fiduciary matters

ERISA and the Code impose certain duties on persons who are fiduciaries of a Plan subject to Title I of ERISA or Section 4975 of the Code, as well as entities whose underlying assets are considered to include “plan assets” of such Plans (an “**ERISA Plan**”) and prohibit certain transactions involving the assets of an ERISA Plan and its fiduciaries or other interested parties. Under ERISA and the Code, any person who exercises any discretionary authority or control over the administration of an ERISA Plan or the management or disposition of the assets of an ERISA Plan, or who renders investment advice to an ERISA Plan for a fee or other compensation (an “**investment advice fiduciary**”), is generally considered to be a fiduciary of the ERISA Plan.

When considering an investment in the Direct Issuance Notes of the assets of any Plan, a fiduciary should determine whether the investment is in accordance with the documents and instruments governing the Plan and the applicable provisions of ERISA, the Code or any Similar Laws relating to a fiduciary’s duties to the Plan including, without limitation, the prudence, diversification, delegation of control and prohibited transaction provisions of ERISA, the Code and any applicable Similar Laws.

Each ERISA Plan should consider the fact that none of the Issuers, the Guarantor or the Dealers or any of their respective affiliates (collectively, the “**Transaction Parties**”) is acting, or will act, as a fiduciary to any ERISA Plan with respect to the decision to purchase or hold the Direct Issuance Notes, and that the Transaction Parties have financial interests in the ERISA Plan’s purchase and holding of the Direct Issuance Notes, which interests may conflict with the interest of the ERISA Plan. The Transaction Parties are not undertaking to provide impartial investment advice or advice based on any particular investment need, or to give advice in a fiduciary capacity, with respect to the decision to purchase or hold the Direct Issuance Notes. All communications, correspondence and materials from the Transaction Parties with respect to the Direct Issuance Notes are intended to be general in nature and are not directed at any specific purchaser of the Direct Issuance Notes, and do not constitute advice regarding the advisability of investment in the Direct Issuance Notes for any specific purchaser. The decision to purchase and hold the Direct Issuance Notes must be made solely by each prospective ERISA Plan purchaser on an arm’s length basis.

### Prohibited transaction issues

Section 406 of ERISA and Section 4975 of the Code prohibit ERISA Plans from engaging in specified transactions involving plan assets with persons or entities who are “parties in interest,” within the meaning of ERISA, or “disqualified persons,” within the meaning of Section 4975 of the Code, unless an exemption is available. A party in interest or disqualified person, including a fiduciary, of an ERISA Plan who engages in a non-exempt prohibited transaction may be subject to excise taxes and other penalties and liabilities under ERISA and the Code.

The acquisition and/or holding of Direct Issuance Notes by an ERISA Plan with respect to which a Transaction Party is considered a party in interest or a disqualified person may constitute or result in a direct or indirect prohibited transaction under Section 406 of ERISA and/or Section 4975 of the Code, unless the investment is acquired and is held in accordance with an applicable statutory, class or individual prohibited transaction exemption. Included among these statutory exemptions are Section 408(b)(17) of ERISA and Section 4975(d)(20) of the Code, which exempt certain transactions (including, without limitation, a sale and purchase of securities) between a Plan and a party in interest so long as (i) such party in interest is treated as such solely by reason of providing services to the Plan, (ii) such party in interest is not a fiduciary which renders investment advice, or has or exercises discretionary authority or control, with respect to the plan assets involved in such transaction, or an affiliate of any such person and (iii) the Plan neither receives less than nor pays more than “adequate consideration” (as defined in such Sections) in connection with such transaction. In addition, the U.S. Department of Labor has issued prohibited transaction class exemptions (“**PTCEs**”) that may apply to the

acquisition and holding of the Direct Issuance Notes. These class exemptions include, without limitation, PTCE 84-14 respecting transactions determined by independent qualified professional asset managers, PTCE 90-1 respecting insurance company pooled separate accounts, PTCE 91-38 respecting bank collective investment funds, PTCE 95-60 respecting life insurance company general accounts and PTCE 96-23 respecting transactions determined by in-house asset managers. There can be no assurance that all of the conditions of any such exemptions will be satisfied.

Because of the foregoing, the Direct Issuance Notes may not be purchased or held by any person investing “plan assets” of any Plan, unless such purchase and holding will not constitute a non-exempt prohibited transaction under ERISA and the Code or violate any applicable Similar Laws.

The foregoing discussion is general in nature and is not intended to be all inclusive. Due to the complexity of these rules and the penalties that may be imposed upon persons involved in non-exempt prohibited transactions, it is particularly important that fiduciaries or other persons considering investing in the Direct Issuance Notes on behalf of, or with the assets of, any Plan, consult with their counsel regarding the potential applicability of ERISA, Section 4975 of the Code and any Similar Laws to such transactions and whether an exemption would be applicable.

### **Representation**

Accordingly, by its acceptance of a Direct Issuance Note, each purchaser and subsequent transferee will be deemed to have represented and warranted that either (1) no portion of the assets used by such purchaser or transferee to acquire or hold the Direct Issuance Notes constitutes assets of any Plan or (2) the purchase and holding of the Direct Issuance Notes by such purchaser or transferee will not constitute or result in a non-exempt prohibited transaction under Section 406 of ERISA or Section 4975 of the Code or a violation under any applicable Similar Laws.

Further, if the purchaser or subsequent transferee is an ERISA Plan, such purchaser or subsequent transferee will be deemed to have represented and warranted that none of the Transaction Parties has acted as the ERISA Plan’s fiduciary (within the meaning of ERISA or the Code), or has been relied upon for any advice, with respect to the purchaser or transferee’s decision to acquire and hold the Direct Issuance Notes, and none of the Transaction Parties shall at any time be relied upon as the ERISA Plan’s fiduciary with respect to any decision to acquire, continue to hold or transfer the Direct Issuance Notes.

### **Certain ERISA Considerations With Respect to Guaranteed Notes**

Guaranteed Notes are not permitted to be acquired or held by ERISA Plans. Subject to certain restrictions described below, Guaranteed Notes are permitted to be acquired and held by governmental plans, non-electing church plans and other arrangements that are not subject to ERISA or Section 4975 of the Code and are not ERISA Plans (collectively, “**Non-ERISA Plans**”).

ERISA imposes fiduciary standards and certain other requirements on ERISA Plans and on those persons who are fiduciaries with respect to ERISA Plans. Non-ERISA Plans are subject to applicable state, local or federal law, as well as the restrictions of duties of common law, and may also be subject to prohibited transaction provisions that operate similarly to those under ERISA.

Under the regulations issued by the US Department of Labor (“**DOL**”), as modified by Section 3(42) of ERISA (the “**Plan Asset Regulations**”), unless certain exceptions apply, if an ERISA Plan invests in an “equity interest” of an entity, that is neither a “publicly offered security” nor a security issued by an investment company registered under the Investment Company Act, the ERISA Plan’s assets include both the equity interest and an undivided interest in each of the entity’s underlying assets. This “look through” rule will only apply where ERISA Plans own 25 percent or more of the value of any class of equity interest in the entity. For purposes of this 25 percent determination, the value of equity interests held by persons (other than ERISA Plans) that have discretionary authority or control with respect to the assets of the entity or that provide investment advice for a fee (direct or indirect) with respect to such assets (or any affiliate of such person) is disregarded. An equity interest does not include debt (as determined by applicable local law) which does not have substantial equity features.

If the underlying assets of an entity are deemed to be plan assets, those with discretionary authority or control over the entity would be fiduciaries with respect to the entity’s assets. The assets of the entity would also be subject to the prohibited transaction rules of ERISA and Section 4975 of the Code, as well as other rules applicable to plan assets.

The Issuer believes that the proper characterization of the Guaranteed Notes for U.S. federal income tax purposes is uncertain. The DOL may view the Guaranteed Notes as having substantial equity features. Further, the Issuer will not be able to monitor the noteholders' status as ERISA Plans. Accordingly, the Guaranteed Notes are not permitted to be acquired or held by any ERISA Plan.

Non-ERISA Plans are permitted to acquire and hold the Guaranteed Notes, subject to certain restrictions described below. Each Non-ERISA Plan acquiring and holding the Guaranteed Notes will be deemed to have represented and warranted that the acquisition, holding and disposition of the Guaranteed Notes do not and will not violate any statute, regulation, administrative decision, policy or other legal authority applicable to the Non-ERISA Plan and the acquisition, holding and disposition of the Guaranteed Notes or any interest therein do not and will not result in the assets of the Issuer being considered plan assets of such Non-ERISA Plan. Non-ERISA Plans are generally not subject to ERISA nor do the prohibited transaction provisions of ERISA or Section 4975 of the Code apply to these types of plans. However, governmental plans (as described in Section 3(32) of ERISA), are subject to prohibitions on related-party transactions under Section 503 of the Code, which prohibitions operate similarly to the prohibited transaction rules under ERISA or Section 4975 of the Code, and other Non-ERISA Plans may be subject to similar prohibitions. Accordingly, the fiduciary of a Non-ERISA Plan must consider applicable state or local laws, if any, imposed upon such plan before purchasing and holding a Guaranteed Note or any interest therein.

BY ITS PURCHASE AND HOLDING OF A GUARANTEED NOTE OR ANY INTEREST THEREIN, THE PURCHASER AND/OR HOLDER THEREOF AND EACH TRANSFEREE WILL BE DEEMED TO HAVE REPRESENTED AND WARRANTED AT THE TIME OF ITS PURCHASE AND THROUGHOUT THE PERIOD THAT IT HOLDS SUCH GUARANTEED NOTE OR INTEREST THEREIN, THAT (1) IT IS NOT AND WILL NOT BE AN ERISA PLAN, (2) IF IT IS A GOVERNMENTAL PLAN, AS DEFINED IN SECTION 3(32) OF ERISA, OR OTHER PLAN OR ARRANGEMENT THAT IS NOT SUBJECT TO TITLE I OF ERISA OR SECTION 4975 OF THE CODE, THE ACQUISITION, HOLDING AND DISPOSITION OF THE GUARANTEED NOTES OR ANY INTEREST THEREIN DO NOT AND WILL NOT VIOLATE ANY STATUTE, REGULATION, ADMINISTRATIVE DECISION, POLICY OR ANY OTHER LEGAL AUTHORITY APPLICABLE TO SUCH GOVERNMENTAL PLAN OR OTHER PLAN OR ARRANGEMENT THAT IS NOT SUBJECT TO TITLE I OF ERISA OR SECTION 4975 OF THE CODE, AND THE ACQUISITION, HOLDING AND DISPOSITION OF THIS GUARANTEED NOTE OR ANY INTEREST HEREIN DO NOT AND WILL NOT RESULT IN THE ASSETS OF THE ISSUER OF THE GUARANTEED NOTES BEING CONSIDERED PLAN ASSETS OF SUCH GOVERNMENTAL PLAN OR OTHER PLAN NOT SUBJECT TO TITLE I OF ERISA OR SECTION 4975 OF THE CODE, AND (3) IT WILL NOT SELL OR OTHERWISE TRANSFER ANY GUARANTEED NOTE OR INTEREST THEREIN TO ANY PERSON WITHOUT FIRST OBTAINING THE SAME FOREGOING REPRESENTATIONS, WARRANTIES AND COVENANTS FROM THAT PERSON.

The foregoing is not intended to be exhaustive and the law governing investments by ERISA Plans and Non-ERISA Plans is subject to extensive administrative and judicial interpretations. The foregoing discussion should not be construed as legal advice. Any potential purchaser or holder of Guaranteed Notes should consult counsel with respect to issues arising under ERISA, the Code and other applicable laws and make their own independent decisions.

## SUMMARY OF PRINCIPAL DIFFERENCES BETWEEN TFRS AND IFRS

The following is a general summary of certain principal differences between TFRS and IFRS as applicable to us.

For the purpose of this Offering Memorandum, we have prepared the audited consolidated financial statements for the years ended December 31, 2018, 2019 and 2020, which comprise the consolidated financial statements of GC and its subsidiaries and the separate financial statements of GC.

A summary of certain significant differences between TFRS and IFRS which are relevant to our financial statements is provided below. The differences identified below are limited to those significant differences that are appropriate to our financial statements for the years ended December 31, 2018, 2019 and 2020. However, they should not be construed as being exhaustive. The International Accounting Standard Board (“IASB”) and the Thailand Federation of Accounting Professions (“TFAC”) in Thailand have issued new pronouncements that may impact subsequent periods and have on-going projects that could significantly affect the summary of differences between TFRS and IFRS described below. Accordingly, no attempt has been made to identify differences between TFRS and IFRS as a result of prescribed changes in accounting standards in the future or to identify all future differences that may affect our financial statements as a result of transactions or events that may occur in the future. The Company’s financial statements for the year ended December 31, 2020 were prepared in accordance with the latest TFRS which is based on IFRS Bound Volume 2019.

TFRS and accounting interpretations are issued by the TFAC and endorsed by the Accounting Profession Supervision Committee. These standards and interpretations are supplemented by the requirements of the SET and the Thai SEC, as well as the announcements of the TFAC.

In making an investment decision, investors must rely on their own examination of our business, financial condition and results of operations, the terms of the relevant offering and our financial information. Potential investors should consult their own professional advisers for an understanding of the differences between TFRS and IFRS and how these differences might affect the financial information in this Offering Memorandum.

### **Financial Instruments: Recognition and Measurement**

Before the adoption of TFRS9, there was no specific guidance for the recognition and measurements of derivatives under TFRS. We recognized financial derivatives on the balance sheet at fair value. Moreover, there was no TAS covering accounting for all types of financial instruments similar to IFRS, there were a number of TAS standards which provide guidance on accounting for financial instruments such as TAS 105 Accounting for Investment in Debt and Equity Securities and TAS 101 Doubtful Accounts and Bad Debts.

IFRS 9 *Financial Instruments* provides extensive guidance on the recognition and measurement of financial instruments, including the classification of financial assets and liabilities, accounting for derivatives, hedging activities and impairment.

Significant differences between TFRS and IFRS 9 as applicable to us for the years ended December 31, 2018, 2019 and 2020 are as follows:

#### ***Classification of Financial Assets and Liabilities***

IFRS 9 contains three principal classification categories for financial assets – i.e. measured at: amortized cost, fair value through other comprehensive income and fair value through profit or loss. The classification depends on the objective of the business model within which the financial asset is held. Financial liabilities are either classified into financial liabilities at fair value through profit or loss or financial liabilities carried at amortized cost. Subsequent measurement depends on their respective categories.

On recognition of a financial asset, IFRS 9 requires an assessment of its underlying terms to establish if these constitute solely payments of principal and interest, the “SPPI test.” If the asset does not pass this test it is mandatorily classified at fair value through profit or loss..

For further details on recognition, measurement and classification of financial assets, please refer to Note 3.6 of the financial statements for the year ended December 31, 2020.



### ***Derivative Financial Instruments and Hedge Accounting***

We enter into derivative contracts to manage our exposure from fluctuation of interest rate and foreign exchange rate. We initially recognize financial derivatives on the balance sheet at fair value and subsequent remeasurement is recognized in profit or loss.

Under IFRS 9, any embedded derivatives identified in financial assets would need to be considered in the context of the SPPI test referred to under the classification section above. In the case of liabilities, any embedded derivatives would need to be either (a) bifurcated from the host contract and recognized separately at fair value through profit or loss, or (b) not bifurcated, but with the whole financial liability being recorded at fair value through profit or loss. Under IFRS, derivative financial instruments are required to be recognized at fair value. Changes to fair value are recognized through profit and loss. If hedge accounting is elected and the specific criteria of IFRS 9 are met, volatility in profit and loss is minimized. If a hedge is designated as a fair value hedge, changes in the derivative's fair value are recorded in profit and loss and the hedged item is adjusted for changes in fair value associated with the hedged risk. If designated as a cash flow hedge, the effective portion of the hedge is recorded in equity as a component of other comprehensive income, and released from other comprehensive income into earnings as the hedged item affects earnings. All ineffectiveness in the hedging relationship, as well as derivative instruments not qualifying for hedge accounting, is reflected in the profit or loss immediately.

### ***Impairment of financial assets***

IFRS 9 requires that financial assets that are not measured at fair value through profit and loss, including loans, lease and trade receivables and debt securities be considered for impairment based on an "expected credit loss" model. The model uses a staging approach, under which the allowance for expected credit loss is measured as either the 12-month expected credit losses or the lifetime expected credit losses. The measurement basis generally depends on whether there has been a significant increase in credit risk or whether the financial asset has been credit-impaired since initial recognition. The Company has adopted the TFRS9 which is based on IFRS9 in 2020.

### ***Lease***

IFRS 16 introduces a single lessee accounting model for lessees. A lessee recognizes a right-of-use asset and a lease liability. There are recognition exemptions for short-term leases and leases of low-value items. The Company has adopted the TFRS16 which is based on IFRS16 in 2020.

Under TAS 17, we recognize payments made under operating leases in profit or loss on a straight line basis over the term of the lease, and recognize payments made under finance leases as lease assets and lease liabilities. Under IFRS 16, we will recognize right-of-use assets and lease liabilities for all leases except short-term lease and lease of low-value items. As a result, the nature of expenses related to those leases will now change because we will recognize depreciation of right-of-use assets and interest expenses on leases.

### **Financial Instruments: Presentation and Disclosure**

TFRS requires disclosing significant transactions related to financial instruments but not extensive as those required by IFRS 7 *Financial Instruments: Disclosures*. IFRS 7 requires that the entity disclose qualitative and quantitative information about exposure to risks arising from financial instruments, including specified minimum disclosures about credit risk, liquidity risk and market risk. The qualitative disclosures describe management's objectives, policies and processes for managing those risks. The quantitative disclosures provide information about the extent to which the entity is exposed to risk, based on information provided internally to the entity's key management personnel. Together, these disclosures provide an overview of the entity's use of financial instruments and the exposures to risks they create.

## **LEGAL MATTERS**

Certain matters in connection with this offering as to New York law and U.S. federal law will be passed upon for the Company by Latham & Watkins LLP, and for the Arrangers and Dealers by Clifford Chance. Certain matters in connection with this offering as to Thai law will be passed upon for the Company by Baker & McKenzie Ltd., and for the Arrangers and Dealers by Weerawong, Chinnavat & Partners Ltd.

## **INDEPENDENT AUDITORS**

The consolidated and separate financial statements of PTT Global Chemical Public Company Limited as of and for the years ended December 31, 2020 and 2019 included in this Offering Memorandum, have been audited by Deloitte Touche Tohmatsu Jaiyos Audit Co., Ltd., independent auditors, as stated in their reports appearing herein.

The consolidated and separate financial statements of PTT Global Chemical Public Company Limited as of and for the year ended December 31, 2018 included in this Offering Memorandum, have been audited by KPMG Phoomchai Audit Limited, independent auditors, as stated in their reports appearing herein. Their report for the year ended December 31, 2018 includes an Emphasis of Matter Paragraph which describes the Group's completion of the acquisitions of two investments in subsidiaries, which resulted in the recording of gains on bargain purchases in the consolidated statement of income for the year ended December 31, 2018. The fair value of the businesses acquired and the allocation of the purchase price were provisionally determined and subject to potential amendment.

## GLOSSARY OF TECHNICAL TERMS

Acetone.....	Acetone is a by-product of the production of phenol and is used in the production of MMA, BPA and acetone-based solvents.
Acrylonitrile .....	Acrylonitrile is a commodity used in a wide variety of consumer applications, including the production of acrylic fiber, ABS and SAN. Acrylonitrile is manufactured from propylene, ammonia and air with the use of a catalyst.
Acrylonitrile butadiene styrene or ABS .....	ABS is a tough thermoplastic that has a variety of consumer appliance and automotive component uses. It is made from acrylonitrile, butadiene and styrene.
Alkylation.....	Alkylation is the process by which the molecules of hydrocarbon-based substances are combined with the alkyl group. This process is used to increase the octane of gasoline.
Aromatics .....	A group of unsaturated cyclic hydrocarbons containing one or more benzene rings of six carbon atoms. They are highly reactive and chemically versatile. The group name is derived from the strong and not unpleasant odor characteristic of most chemicals in this family.
Benzene .....	Benzene is an aromatic hydrocarbon in the form of a colorless, flammable liquid. It is created by catalytically reforming naphtha, in the thermal cracking process, and is used in the production of other chemicals such as styrene, cumene, cyclohexane, aniline and chlorobenzene.
Biochemicals .....	Biochemicals are chemicals occurring in living organisms. Includes antibiotics, nucleotides, proteins, peptides, polyamino acids, buffers, lipids, carbohydrates and antibodies.
Biodiesel.....	Biodiesel is vegetable oil or animal fat-based diesel fuel.
Biopolymers .....	Biopolymers are polymers produced by living organisms.
Bis-phenol A or BPA.....	BPA is an intermediate product produced from acetone and phenol used to produce polycarbonate and epoxy-resins.
BTX products .....	BTX products comprise benzene, toluene and xylene isomers, including benzene, paraxylene, orthoxylene and metaxylene.
Butadiene.....	Butadiene is a flammable, colorless gas used in the making of synthetic rubber. It is also used extensively in the production of plastics.
Butane.....	Butane is a gas which liquefies with a relatively small increase in pressure or decrease in temperature. Used for heating, as a petrochemical industry feedstock and as an additive in petrol to enhance its vapor pressure.
Butanediol .....	Butanediol is a chemical intermediate (colorless liquid) which is used in the production of high performance polymers, solvents and fine chemicals.
Butanol .....	Butanol is a chemical intermediate (colorless flammable liquid) which is used to produce other chemicals, as an ingredient in formulated products such as cosmetics, coatings, adhesives and as a solvent.
Butene-1 .....	Butene-1 is an organic chemical base, derived from cracking of petroleum or C4 distillate, and used mainly to produce butadiene and butanol.
C4 .....	C4 is a hydrocarbon compound of butane, butene and butadiene, mainly derived from the process of producing olefins products from the steam cracker.

Capacity utilization rate....	Capacity utilization rate refers to total production expressed as a percentage of nameplate capacity during the relevant year or period.
Cassava starch .....	Cassava starch is an inexpensive carbon source that may be used in the production of biodegradable plastics.
Condensate .....	Condensate is a low-density mixture of hydrocarbon liquids that are present as gaseous components in the raw natural gas produced from natural gas fields.
Condensate residue .....	Hydrocarbons that are gaseous under reservoir conditions and become liquid when the temperature or pressure is reduced. A mixture of propane and higher hydrocarbons.
Condensate residue splitter .....	A condensate residue splitter is a distillation unit to separate condensate residue to refined product such as jet fuel, diesel, and fuel oil.
Corn starch .....	Corn starch is a commonly used raw material for the making of biodegradable plastics.
Cracker .....	See ‘‘Olefins cracker.’’
Cracking .....	Cracking is a refining process which breaks down large molecules of oil into smaller molecules. When the process is achieved by applying heat only, it is known as thermal cracking. If a catalyst is used as well, it is known as catalytic cracking. Cracking uses molecular decomposition and recombination to produce a range of more useful base chemicals suitable for motor fuels or petrochemicals.
Crude oil .....	Crude oil is a mixture of hydrocarbon which is used as the principal feedstock in the refinery for the production of petroleum products.
Cubic meter .....	A cubic meter refers to a cubic meter of gas at a temperature of zero degree Centigrade and an ambient pressure of one atmosphere.
Cumene.....	Cumene is produced from benzene and propylene and is used as a feedstock for producing phenol/acetone.
Cyclohexane .....	Cyclohexane is a colorless, flammable liquid chemical obtained from benzene. It may be used in the production of caprolactam.
Debottlenecking.....	Debottlenecking increases production capacity of existing plants and facilities through the modification of existing equipment to remove throughput restrictions.
Diesel or Gas Oil .....	Diesel or gas oil is a liquid fuel used in diesel engines usually derived from crude oil.
Dimethyl terephthalate or DMT.....	DMT is an organic compound formed from terephthalic acid and methanol used in the production of polyesters, including PET.
Distillates.....	Distillates may refer to any refined oil products.
Elastomers .....	Elastomer is a rubbery material composed of polymers that is capable of recovering its original shape after being stretched to great extents.
Epoxy resin.....	Epoxy resin is a thermosetting resin; used chiefly in strong adhesives and coatings and laminates.
Ethane.....	Ethane is a gaseous hydrocarbon, it is a major constituent of natural gas and a major raw material for the ethylene petrochemical industry.
Ethanolamines .....	Ethanolamines include monoethanolamines, diethanolamines and triethanolamines. Ethanolamines are used as sweeteners, detergent and specialty

cleaner formulations, flexible urethane foam catalysts, pharmaceuticals, textile processing aids, personal care products, metalworking and oil well rust preventatives, concrete additives, agricultural chemicals, photographic emulsions, adhesive/rubber chemical intermediates, packaging and printing inks and others.

Ethoxylate.....	Ethoxylate is produced from ethylene oxide and is often processed to be used as a foaming control agent in soap and detergent.
Ethylbenzene or EB.....	EB is an aromatic liquid hydrocarbon, a chemical intermediate made from the reaction of benzene and ethylene. It is a precursor to styrene production.
Ethylene.....	Ethylene is an essential organic chemical base derived from the thermal cracking of ethane and naphtha or from dehydration of ethanol. It is used to make polyester and many organic chemical intermediates, such as polyethylene, ethylene oxide, ethylene glycol, vinyl chloride, styrene, acetaldehyde and ethanol.
Ethylene oxide or EO .....	EO is a highly reactive chemical intermediate used in the production of ethylene glycol and other oxide derivatives such as glycol esters, polyethylene glycol, polyether polyols, diethylene and triethylene glycols and ethanolamines.
Fatty alcohol or FA.....	FA is an oleochemical derived from vegetable feedstock, such as coconut and palm-kernel oils. During the production process, vegetable oils are first converted into an intermediary chemical, such as methyl ester, which is then fractionated to produce fatty alcohols.
Feedstock.....	Feedstock refers to raw materials used in a production plant.
Fluidized catalytic cracker or FCC.....	FCC is a type of oil refining cracker that makes gasoline components with high octane levels and some co-produced lighter products.
Fuel oil.....	Fuel oil refers to oil generally used as furnace fuel. It is also widely used as a main source of energy for electricity generators.
Gas separation .....	Gas separation is the separation of natural gas.
Glycerin.....	Glycerin is a clear, almost colorless, odorless chemical with applications in, among others, the pharmaceutical, food and personal care product industries.
Hexamethylene Diamine ..	Hexamethylene Diamine is a key ingredient in the production of HDI.
Hexamethylene Diisocyanate or HDI .....	A main use of HDI is in spray paint formulations and coatings. It is also used in the preparation of dental materials and contact lenses.
High density polyethylene or HDPE.....	Produced from ethylene, HDPE is an inexpensive, flexible, durable and chemical-resistant. One of the major uses of HDPE is in blow-molding applications, such as bottles for milk and non-carbonated drinks, fuel tanks for automobiles and containers of household and industrial chemicals. HDPE is also used for films and pipes.
Hydrocarbons .....	Hydrocarbons is used to describe all compounds that consist of hydrogen and carbon. These include crude oil, natural gas, aromatics, olefins and their derivatives.
Hydrocracking .....	Hydrocracking is an oil refinery process that makes use of hydrogen. The process may be used for producing gasoline, jet fuels and high-quality lubricating oils. It may also convert distillation residues into lighter oils.
Hydrodealkylation or HAD.....	HDA is a chemical reaction that involves reacting an aromatic hydrocarbon such as toluene in the presence of hydrogen gas to form a simpler aromatic hydrocarbon.

Jet fuel or Jet A1 .....	Jet fuel is a refined product used for both commercial aviation and military aircraft. There are several jet fuel specifications. It is also known as turbine fuel. The primary source of jet fuel blending stocks is kerosene from CDU and hydrocracking unit.
Jetty .....	A jetty is a breakwater constructed to protect or defend a harbor, stretch of coast, or riverbank.
Lactic acid .....	Lactic acid is used to manufacture PLA, a bioplastic with a range of applications, including as materials used in automobile interiors, food and cosmetics packaging and other end products.
Light naphtha.....	Light naphtha is a chemical produced from the distillation of petroleum. It is a principal feedstock in the production of olefins products.
Linear low-density polyethylene or LLDPE	LLDPE is a type of polyethylene and has basic properties similar to LDPE. LDPE and LLDPE are to a certain extent substitutable for each other. The most significant end use for LLDPE is film.
Liquefied petroleum gas or LPG.....	LPG is a mixture of gases, usually propane and butane, used as fuel in heating appliances and vehicles and also as a petrochemical feedstock.
LLDPE rotomolding compound.....	LLDPE rotomolding compound is an LLDPE which is pulverized to a powder form for processing in rotational moulding. LLDPE rotomolding compound has many applications such as water tanks, playground equipments and others.
Low density polyethylene or LDPE .....	LDPE is a type of polyethylene used for thin films, tubes, mechanical parts, toys and electric wire insulation.
Methane .....	Methane is a light, colorless gas which is the principal component in natural gas and a major raw material for the production of methanol.
Methanol.....	Methanol is the simplest organic alcohol and is a colorless, flammable liquid. While originally produced from wood or coal, today methanol is produced mainly using methane as feedstock.
Methylamine derivatives ..	Methylamine derivatives have beneficial uses in many industries, including water treatment, gas and oil treatment, animal nutrient, agricultural chemicals and personal care products.
Methyl esters .....	Methyl esters are oleochemicals derived from vegetable feedstock, such as palm-kernel oils. Methyl esters may be used in the production of fatty alcohols and in other industries.
MMA .....	MMA is produced from acetone and is used to manufacture PMMA resins.
Mixed C4.....	Mixed C4 is a colorless gas produced from naphtha crackers. It may be used in as a raw material for the production of butadiene and butane-1.
Mixed xylene .....	Mixed xylene is a mixture containing xylenes such as orthoxylene, metaxylene and paraxylene and is used in the production of solvents and gasoline.
Mono-ethylene glycol or MEG.....	MEG is an organic chemical compound derived from the oxidation of ethylene. It is produced by the reaction of ethylene oxide and water. MEG is mainly used for polyester and anti-freeze production.
Monomer .....	Monomer is a feedstock material for the manufacture of polymers and derivative products.
MOPS .....	MOPS, or Means of-Platts CFR Singapore, shows the daily price assessment of CFR Singapore open market for petrochemical products.

Nameplate capacity .....	Nameplate capacity is the capacity of a production facility based on technology licenses and/or production rates guaranteed by the construction contractor.
Naphtha .....	Naphtha is a general term used for low boiling hydrocarbon fractions that are a product of crude oil or condensate splitter.
Natural gas.....	Natural gas is a colorless, highly flammable gaseous hydrocarbon consisting primarily of methane, ethane, and small amounts of heavier gaseous hydrocarbon compounds such as propane. It is a primary feedstock for the production of olefins products.
Natural gas liquids or NGL .....	NGLs generally comprise a mixture of ethane, propane, butanes and smaller amounts of other lighter hydrocarbons
Olefins .....	Olefins are straight or branched-chain hydrocarbon with at least one unsaturated carbon-carbon bond. Produced by cracking feedstocks from raw materials such as natural gas and light naphtha. The main olefins are ethylene and propylene and also include butadiene, and C4 derivatives.
Olefins cracker .....	An olefins cracker breaks down light naphtha or gas feedstocks into olefins, principally ethylene and propylene.
Oleochemicals .....	Oleochemicals are bio-based and environmentally friendly chemicals derived from plants and animal fats, which have similar functions as petrochemicals derived from petroleum.
Orthoxylene .....	An aromatic compound used in the manufacture of plasticizers and unsaturated polyesters.
Ozone acid.....	Ozone acid may be used to produce synthetic lubricants, as well as components used for adhesives, films and fibers.
Palm-kernel oil .....	Palm-kernel oil is a bio-based edible plant oil derived from the kernel of the oil palm. It may be processed into fatty alcohols and methyl esters.
Palm oil .....	Palm oil is a vegetable oil that can be used as a raw material in both food and non-food industries. Its uses in non-food industries include the production of a wide variety of derivatives and end products such as oleochemicals.
Paraxylene, PX or PXE ....	Paraxylene is an aromatic hydrocarbon in the form of a colorless, flammable liquid that is recovered from mixed xylenes streams by adsorption and by isomerization of aromatics. It is the upstream raw material for PTA and DMT, which are used for production of downstream polyester fiber and PET packaging resin.
Paraxylene, or FECF .....	Paraxylene "Far East Contract Price."
Petrochemicals.....	Petrochemicals are chemicals derived from petroleum or natural gas.
Phenol.....	Phenol is produced from cumene, and is used in the production of BPA, phenolic resins and caprolactam.
Plasticizers.....	A substance used as an additive to enhance the properties of polymers.
Plastic additives .....	Plastic additives are a complex blend of materials used to mix with polymers in producing plastic products.
PMMA.....	PMMA resins, including acrylic sheets, are used in a wide range of architectural and industrial applications, ranging from point of sale retail displays to glazing and decorative light panels, and compounds for molding and extrusion.



Polycarbonate .....	Polycarbonate is an engineering thermoplastic material which, due to its superior optical qualities, structural strength and weight, has a wide range of uses, including CDs and DVDs, optic-fibers, optical lenses, structural parts in cars and trucks and housings for electrical household appliances and office equipment.
Polyethylene terephthalate or PET .....	PET is made by the combination of ethylene glycol and terephthalic acid. Typical end uses for PET are packaging and fibers.
PET fiber .....	PET fiber is used for the production of textile industry.
PET resins.....	PET resins is used for the production of clear PET bottles.
Polyethylene glycol .....	Polyethylene glycol is a water-soluble linear polymer produced by the reaction of ethylene oxide. It is used in a wide range of applications from industrial manufacturing to medicine. For industrial applications, it is used as a dispersant for toothpastes, an ink dissolvent and lubricant for the print heads and precipitant for protein crystallization. It is also used to improve flexibility of polyurethanes.
Polyethylene or PE .....	PE is a polymer, derived from polymerization of ethylene, and used to make various plastics such as film and sheet, piping and containers.
Polylactic acid or PLA.....	PLA is a biodegradable polymer that can be used in short-term packaging and for biomedical applications such as implants.
Polymer .....	When certain individual molecules (monomers) come together and link up in a chain-like fashion, they form a polymer. The chemical reaction that forms a polymer is called polymerization.
Polyol .....	A polyol is an alcohol containing multiple hydroxyl group.
Polypropylene or PP .....	PP is a polymer derived from the polymerization of propylene. It is used to make packaging materials, toys, mechanical parts, housewares and synthetic fibers.
Polystyrene .....	General purpose, or “crystal”, polystyrene and high impact polystyrene are hard and brittle materials which are used mainly for packaging, appliance and electrical housings and insulation. Both forms are also used for plastic molding applications. Styrene is the main feedstock used to manufacture polystyrene.
Polyurethane or PU.....	PU is a polymer composed of a chain of organic units joined by urethane links.
Propane.....	Propane is a gaseous hydrocarbon in its natural state but can be easily liquefied. Its major end uses are as a fuel and as a feedstock for petrochemicals. It is also referred to as C3.
Propylene.....	Propylene is a flammable gas which is largely derived either as a co- product of the refinery FCC process used to make gasoline or as a co-product of the steam cracking process used to make ethylene. Propylene has virtually no independent end use, but is an important input for a significant number of industrial products, and is the main feedstock used to make polypropylene and acrylonitrile.
Purified terephthalic acid or PTA (Terephthalic acid or TPA).....	PTA or TPA is a colorless commodity chemical produced from paraxylene and a key raw material component used in the polyester value chain, mainly used in the manufacture of fiber, PET, film, and engineering resins.
Pyrolysis gasoline or pygas .....	Pyrolysis gasoline is a naphtha-range product with a high aromatics content used in the production of benzene, toluene and mixed xylenes and as a motor vehicle gas blending stock.
Refining.....	Refining is the conversion of crude oil into useful products, such as naphtha, a feedstock for the petrochemical industry. The general refining process begins with the separation of crude oil into different fractions by distillation. The

fractions are further treated to convert them into mixtures of more useful products by various methods such as cracking, reforming, alkylation, polymerization and isomerization. These mixtures of new compounds are then separated using methods such as fractionation and solvent extraction.

Reformate .....	Reformate serves as feedstock for the production of aromatics products.
Resin.....	Resin refers to any natural or synthetic organic compound consisting of a non-crystalline or viscous liquid substance. Natural resins are organic substances that are transparent or translucent, formed in plant secretions. Synthetic resins comprise a large class of synthetic products that have some of the physical properties of natural resins but are different chemically. Most synthetic resins are polymers.
Selective Toluene Disproportionation or STDP.....	STDP is a conversion process that produces paraxylene-rich mixed xylene along with high purity benzene streams from toluene. STDP produces a higher purity stream of paraxylene (i.e., greater than 80%) as opposed to the conventional TDP which produces an equilibrium mixture of xylenes (i.e., approximately 20% paraxylene).
Solvents .....	Solvents are used to dissolve solids and keep them in liquid form.
Splitter .....	A splitter is a separating unit.
Steam cracking .....	Steam cracking is a petrochemical process, similar to thermal cracking, used to produce olefins, particularly ethylene, from various feedstocks for petrochemical manufacture. The most common feedstocks are ethane, butane, and naphtha.
Styrene, styrene monomer or SM .....	Styrene, a colorless liquid hydrocarbon which under normal conditions is a flammable liquid, is produced from ethylene and benzene, via ethylbenzene. The largest use of styrene is in the production of polystyrene, although it is also used in many other derivatives such as ABS, SBR, SBL and SAN.
SBR .....	SBR is a polymer derivative made from styrene and butadiene, used mainly in manufacture of tires and other rubber products.
Thermal cracking.....	Thermal cracking is a petroleum refining process used to break up heavy oil molecules into lighter, more valuable fractions (e.g. gasoline, kerosene) by the use of high temperature without the aid of catalysts. It is used to convert gas oils into naphtha.
Thermoplastic .....	A thermoplastic is a plastic which softens when heated and hardens again when cooled. Thermoplastics include PE, polypropylene and polystyrene.
Toluene.....	Toluene is an aromatic hydrocarbon used as an octane enhancer in gasoline, as a chemical intermediate in the production of benzene, paraxylene, TDI and as a solvent in paints.
Toluene diisocyanate or TDI.....	TDI is an intermediary chemical used in the production of polyurethane.
Toluene disproportionation or TDP.....	TDP is a method by which benzene and xylenes are produced from toluene.
Turnaround .....	Turnaround is the temporary shutdown of a refinery or petrochemical production facility for required maintenance.

Volatile organic compounds or VOC ..... VOC is used in a variety of everyday products, such as solvent-based paints and coatings, adhesives, sealants, printing inks, organic solvents and other petroleum products. VOC may be emitted as gas, which may cause adverse health effects.

Xylene ..... Xylene is an aromatics hydrocarbon that is a base for many petrochemicals and is used to derive orthoxylene, metaxylene and paraxylene.

## INDEX TO THE FINANCIAL STATEMENTS

### **Consolidated and separate financial statements of the Company as of and for the year ended December 31, 2020, including comparative information presented as corresponding figures as of and for the year ended December 31, 2019**

Independent Auditor's Report .....	F-2
Statements of Financial Position .....	F-5
Statements of Profit or Loss .....	F-8
Statements of Comprehensive Income .....	F-9
Statement of Changes in Shareholders' Equity .....	F-10
Statements of Cash Flows .....	F-12
Notes to the Financial Statements .....	F-15

### **Consolidated and separate financial statements of the Company as of and for the year ended December 31, 2019, including comparative information presented as corresponding figures as of and for the year ended December 31, 2018**

Independent Auditor's Report .....	F-120
Statements of Financial Position .....	F-124
Statements of Profit or Loss .....	F-127
Statements of Comprehensive Income .....	F-128
Statement of Changes in Shareholders' Equity .....	F-129
Statements of Cash Flows .....	F-131
Notes to the Financial Statements .....	F-133

### **Consolidated and separate financial statements of the Company as of and for the year ended December 31, 2018, including comparative information presented as corresponding figures as of and for the year ended December 31, 2017**

Independent Auditor's Report .....	F-223
Statements of Financial Position .....	F-229
Statement of Income .....	F-232
Statements of Comprehensive Income .....	F-233
Statement of Changes in Shareholders' Equity .....	F-234
Statements of Cash Flows .....	F-236
Notes to the Financial Statements .....	F-239

## REPORT OF THE INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

TO THE SHAREHOLDERS AND BOARD OF DIRECTORS  
PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED

### Opinion

We have audited the consolidated financial statements of PTT Global Chemical Public Company Limited and its subsidiaries (the “Group”) and the separate financial statements of PTT Global Chemical Public Company Limited (the “Company”) which comprise the consolidated and separate statements of financial position as at December 31, 2020, and the related consolidated and separate statements of profit or loss, comprehensive income, changes in shareholders’ equity and cash flows for the year then ended, and notes to the consolidated and separate financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated and separate financial statements present fairly, in all material respects, the financial position of PTT Global Chemical Public Company Limited and its subsidiaries and of PTT Global Chemical Public Company Limited as at December 31, 2020, and financial performance and cash flows for the year then ended in accordance with Thai Financial Reporting Standards (“TFRSs”).

### Basis for Opinion

We conducted our audit in accordance with Thai Standards on Auditing (“TSAs”). Our responsibilities under those standards are further described in the Auditor’s Responsibilities for the Audit of the Consolidated and Separate Financial Statements section of our report. We are independent of the Group in accordance with the Federation of Accounting Professions’ Code of Ethics for Professional Accountants together with the ethical requirements that are relevant to the audit of the consolidated and separate financial statements, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

### Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated and separate financial statements of the current period. This matter was addressed in the context of our audit of the consolidated and separate financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on this matter.

Key Audit Matter	Audit Responses
<p><b>The measurement of inventories valuation</b></p> <p>Inventories of the Group are significant balance to the consolidated and separate financial statements. The raw material and finished goods are commodities that contain intense price volatility. This volatility may lead to valuation of inventories at the end of reporting period as inventories are measured at the lower of cost or net realizable value.</p> <p>The accounting policy of inventories valuation of the Group and the detail of inventories are disclosed in notes to the financial statements no. 3.5 and 8, respectively.</p>	<p>Key audit procedures included:</p> <ul style="list-style-type: none"><li>• Gaining understanding and performing test of design and implementation as well as operating effectiveness of the relevant controls over inventories valuation measurement process.</li><li>• Assessing the appropriateness of the methodology used to calculate the net realizable value of inventories at the reporting period, considering the reasonableness of the market prices used by reference to expected selling price of commodity, and testing the accuracy of the calculation.</li><li>• If the net realizable value is lower than the cost, considering to propose the adjustment of allowance for diminution in value of inventories in the consolidated and separate financial statements.</li><li>• Assessing the adequate disclosure in relation to the estimation of allowance for diminution in value of inventories in notes to the financial statements.</li></ul>

### **Other Information**

Management is responsible for the other information. The other information comprises the information included in the annual report, but does not include the consolidated and separate financial statements and our auditor's report thereon.

Our opinion on the consolidated and separate financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the consolidated and separate financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

### **Responsibilities of Management and Those Charged with Governance for the Consolidated and Separate Financial Statements**

Management is responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRSs, and for such internal control as management determines is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated and separate financial statements, management is responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group and the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

### **Auditor's Responsibilities for the Audit of the Consolidated and Separate Financial Statements**

Our objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated and separate financial statements.

As part of an audit in accordance with TSAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's and the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.

- Conclude on the appropriateness of management’s use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group’s and the Company’s ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor’s report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor’s report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated and separate financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor’s report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

**BANGKOK**  
February 15, 2021

Mongkol Somphol  
Certified Public Accountant (Thailand)  
Registration No. 8444  
**DELOITTE TOUCHE TOHMATSU JAIYOS AUDIT CO., LTD.**

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF FINANCIAL POSITION**  
**AS AT DECEMBER 31, 2020**

Unit : Baht

	Notes	Consolidated financial statements		Separate financial statements	
		2020	2019	2020	2019
<b>ASSETS</b>					
<b>CURRENT ASSETS</b>					
Cash and cash equivalents	5	44,313,023,735	18,840,303,824	31,535,290,773	12,397,417,335
Temporary investments	12	-	6,719,876,693	-	4,045,408,193
Current investments in financial assets	12	16,345,335,498	-	15,945,335,498	-
Trade receivables	6	29,276,983,757	34,156,903,430	22,591,899,926	28,118,814,466
Other receivables	7	3,725,913,018	3,149,134,830	2,013,182,817	2,314,454,135
Short-term loans to related parties	28	-	1,122,984,334	2,401,461,599	1,552,287,222
Current portion of long-term loans to related parties	28	537,230,897	1,558,404,698	537,230,897	1,558,404,698
Inventories	8	33,445,076,435	36,252,319,422	22,588,222,395	26,380,866,034
Receivable from oil fuel fund		352,786,655	151,284,595	352,786,655	151,284,595
Value-added tax receivable		1,017,003,656	1,719,267,430	-	492,422,615
Derivatives	35	126,419,586	27,747,308	102,956,057	13,789,747
Other current assets		771,178,572	796,042,409	438,395,600	526,201,836
<b>Total Current Assets</b>		<b>129,910,951,809</b>	<b>104,494,268,973</b>	<b>98,506,762,217</b>	<b>77,551,350,876</b>
<b>NON-CURRENT ASSETS</b>					
Investments in subsidiaries	9	-	-	76,486,497,045	72,551,269,640
Investments in joint ventures	10	32,537,248,418	32,444,000,414	15,372,927,810	15,372,927,810
Investments in associates	11	31,872,568,662	29,829,463,974	27,545,624,981	26,812,494,981
Other long-term investments	12	-	2,910,779,525	-	2,340,894,476
Non-current investments in financial assets	12	1,088,132,065	-	391,765,312	-
Long-term loans to related parties	28	176,910,584	716,754,888	176,910,584	716,754,888
Investment properties	13	6,059,315,512	6,497,895,823	1,740,783,392	1,740,783,392
Property, plant and equipment	14	269,176,931,994	264,563,608,523	182,435,178,148	181,731,952,350
Right-of-use assets	15	7,039,246,740	-	6,247,321,966	-
Land leasehold rights	16	-	190,505,835	-	184,162,171
Goodwill	17	931,328,672	931,328,672	-	-
Intangible assets	18	8,591,696,182	8,220,730,578	5,832,116,969	5,809,170,180
Deferred tax assets	19	1,193,775,690	1,073,520,214	-	-
Other non-current assets		804,546,537	641,532,387	237,170,701	278,035,974
<b>Total Non-current Assets</b>		<b>359,471,701,056</b>	<b>348,020,120,833</b>	<b>316,466,296,908</b>	<b>307,538,445,862</b>
<b>TOTAL ASSETS</b>		<b>489,382,652,865</b>	<b>452,514,389,806</b>	<b>414,973,059,125</b>	<b>385,089,796,738</b>

Notes to the financial statements form an integral part of these statements



**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF FINANCIAL POSITION (CONTINUED)**  
**AS AT DECEMBER 31, 2020**

Unit : Baht

	Notes	Consolidated		Separate	
		financial statements		financial statements	
		2020	2019	2020	2019
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>					
<b>CURRENT LIABILITIES</b>					
Short-term borrowings from					
financial institutions	20.1	19,000,000	2,020,952,712	-	-
Trade payables	22	20,114,248,744	25,479,128,189	14,813,013,042	19,920,282,931
Other payables	23	12,505,402,375	13,905,785,462	6,237,433,297	8,302,479,491
Payables to contractors		2,955,798,483	2,717,169,778	2,020,050,501	2,778,691,141
Current portion of long-term borrowings					
from financial institutions	20.2	1,974,396,723	8,108,139,389	-	7,077,794,084
Current portion of long-term borrowings					
from other parties	20.2	44,720,765	40,599,692	-	-
Current portion of debentures	20.3	19,997,512,767	-	19,997,512,767	-
Current portion of lease liabilities	21	1,056,561,073	186,734,336	1,104,511,331	140,987,006
Short-term borrowings from related parties	20.1, 28	-	-	5,607,533,287	3,040,910,019
Income tax payable		218,499,158	125,041,110	-	-
Current provisions		38,040,125	97,106,390	-	-
Derivatives	35	100,644,196	319,631,248	98,520,508	68,847,127
Other current liabilities		16,664,501	32,849,201	-	-
Total Current Liabilities		<u>59,041,488,910</u>	<u>53,033,137,507</u>	<u>49,878,574,733</u>	<u>41,329,991,799</u>
<b>NON-CURRENT LIABILITIES</b>					
Long-term borrowings from					
financial institutions	20.2	60,977,020,390	26,517,395,423	32,831,030,148	2,995,267,683
Long-term borrowings from other parties	20.2	249,277,714	268,922,401	-	-
Long-term borrowing from a related party	20.2, 28	-	-	14,947,739,623	14,991,042,331
Debentures	20.3	65,034,485,827	70,131,423,772	50,166,555,151	55,221,250,537
Lease liabilities	21	5,730,475,260	214,528,410	4,959,309,709	148,195,224
Deferred tax liabilities	19	1,722,849,607	2,465,252,662	905,155,989	1,591,933,250
Provisions for employee benefits	24	6,378,372,984	5,558,472,038	4,549,218,304	4,014,311,572
Other non-current provisions		675,728,127	420,019,035	-	-
Derivatives	35	95,878,510	12,423,815	-	12,423,815
Other non-current liabilities		483,116,039	297,466,567	396,595,553	211,741,142
Total Non-current Liabilities		<u>141,347,204,458</u>	<u>105,885,904,123</u>	<u>108,755,604,477</u>	<u>79,186,165,554</u>
<b>TOTAL LIABILITIES</b>		<u>200,388,693,368</u>	<u>158,919,041,630</u>	<u>158,634,179,210</u>	<u>120,516,157,353</u>

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF FINANCIAL POSITION (CONTINUED)**  
**AS AT DECEMBER 31, 2020**

Unit : Baht

	Notes	Consolidated		Separate	
		financial statements		financial statements	
		2020	2019	2020	2019
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>					
(CONTINUED)					
SHAREHOLDERS' EQUITY					
Share capital	25				
Authorized share capital					
4,508,849,117 ordinary shares of					
Baht 10 each		45,088,491,170	45,088,491,170	45,088,491,170	45,088,491,170
Issued and paid-up share capital					
4,508,849,117 ordinary shares of					
Baht 10 each		45,088,491,170	45,088,491,170	45,088,491,170	45,088,491,170
Treasury stock	27	(1,187,603,325)	(1,187,603,325)	(1,187,603,325)	(1,187,603,325)
Premium on ordinary shares	26	36,936,829,684	36,936,829,684	36,936,829,684	36,936,829,684
Premium on treasury stock	26	1,386,740,109	1,386,740,109	1,386,740,109	1,386,740,109
Difference arising from business combination					
under common control	26	1,690,706,891	1,690,706,891	77,453,518	77,453,518
Difference arising from the change in					
the ownership interest in an investment	11	(3,407,679,334)	(3,407,679,334)	-	-
Put option over non-controlling interest	2.6	(1,286,083,982)	-	-	-
Retained earnings					
Appropriated					
Legal reserve	26	4,512,930,269	4,512,930,269	4,512,930,269	4,512,930,269
Loan repayment reserve		807,802,564	807,802,564	807,802,564	807,802,564
Projects expansion reserve		12,446,994,126	12,446,994,126	12,446,994,126	12,446,994,126
Treasury stock reserve	26, 27	1,187,603,325	1,187,603,325	1,187,603,325	1,187,603,325
Unappropriated		183,652,322,579	187,854,749,537	155,067,062,758	163,299,727,947
Other components of shareholder's equity		(813,946,776)	(1,487,395,383)	14,575,717	16,669,998
Total attributions to owners of the parent		281,015,107,300	285,830,169,633	256,338,879,915	264,573,639,385
Non-controlling interests		7,978,852,197	7,765,178,543	-	-
<b>TOTAL SHAREHOLDERS' EQUITY</b>		<b>288,993,959,497</b>	<b>293,595,348,176</b>	<b>256,338,879,915</b>	<b>264,573,639,385</b>
<b>TOTAL LIABILITIES AND</b>					
<b>SHAREHOLDERS' EQUITY</b>		<b>489,382,652,865</b>	<b>452,514,389,806</b>	<b>414,973,059,125</b>	<b>385,089,796,738</b>

Notes to the financial statements form an integral part of these statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF PROFIT OR LOSS**  
**FOR THE YEAR ENDED DECEMBER 31, 2020**

Unit : Baht

	Notes	Consolidated financial statements		Separate financial statements	
		2020	2019	2020	2019
Revenues from sale of goods and rendering of services		329,291,166,983	412,810,235,767	270,233,104,363	351,547,082,842
Cost of sale of goods and rendering of services		(317,093,362,394)	(390,619,277,638)	(268,328,751,453)	(339,068,290,381)
Gross profit		12,197,804,589	22,190,958,129	1,904,352,910	12,478,792,461
Investment income		362,352,831	1,000,821,422	3,501,096,568	5,195,501,283
Other income		1,920,160,459	1,317,855,026	2,704,704,537	1,916,888,618
Gain on bargain purchases	4	-	31,482,857	-	-
Selling and distribution expenses		(3,687,133,983)	(3,931,395,732)	(1,823,419,161)	(1,962,918,351)
Administrative expenses		(11,194,067,223)	(12,537,256,860)	(7,404,040,088)	(8,741,700,962)
Reversal of expenses from raw materials derogation		-	232,483,965	-	-
Reversal of (expenses from) impairment losses on assets		312,702,016	-	-	(63,052,760)
Net derivative gain		1,168,860,166	1,498,820,135	629,245,829	1,499,404,054
Net gain (loss) on foreign exchange rate		(349,539,489)	1,755,535,325	(274,500,540)	1,523,281,288
Finance costs	31	(3,511,095,162)	(3,119,419,221)	(3,276,306,464)	(2,618,771,176)
Share of profit of investments in joint ventures	10	863,193,963	2,625,714,096	-	-
Share of profit of investments in associates	11	2,459,356,255	1,933,059,453	-	-
Profit (loss) before Income tax benefit (expense)		542,594,422	12,998,658,595	(4,038,866,409)	9,227,424,455
Income tax benefit (expense)	19	109,285,418	(649,361,925)	659,318,891	(74,349,225)
<b>PROFIT (LOSS) FOR THE YEAR</b>		<b>651,879,840</b>	<b>12,349,296,670</b>	<b>(3,379,547,518)</b>	<b>9,153,075,230</b>
<b>PROFIT (LOSS) ATTRIBUTABLE TO</b>					
Owners of the parent		199,606,690	11,682,079,566	(3,379,547,518)	9,153,075,230
Non-controlling interests		452,273,150	667,217,104	-	-
		<b>651,879,840</b>	<b>12,349,296,670</b>	<b>(3,379,547,518)</b>	<b>9,153,075,230</b>
<b>BASIC EARNINGS (LOSS) PER SHARE</b>	33	<b>0.04</b>	<b>2.59</b>	<b>(0.75)</b>	<b>2.03</b>

Notes to the financial statements form an integral part of these statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF COMPREHENSIVE INCOME**  
**FOR THE YEAR ENDED DECEMBER 31, 2020**

Unit : Baht

Notes	Consolidated financial statements		Separate financial statements	
	2020	2019	2020	2019
<b>PROFIT (LOSS) FOR THE YEAR</b>	651,879,840	12,349,296,670	(3,379,547,518)	9,153,075,230
<b>OTHER COMPREHENSIVE INCOME (LOSS)</b>				
Items that will be reclassified subsequently to profit or loss				
Exchange differences on translating financial statements	239,453,623	(675,835,696)	-	-
Gain (loss) on remeasurement of investments in financial assets measured at fair value through other comprehensive income	(17,597,358)	33,877,577	(17,597,358)	33,877,577
Gain (loss) on cash flow hedges	293,797,310	(262,701,249)	82,695,848	(482,589,523)
Share of other comprehensive income (loss) of joint ventures	10 54,122,545	(446,306,794)	-	-
Share of other comprehensive income (loss) of associates	11 89,762,492	(383,170,024)	-	-
Items that will not be reclassified subsequently to profit or loss				
Loss on remeasurements of defined benefit plans	(344,793,249)	(54,831,636)	(216,626,068)	-
Loss on remeasurement of investments in financial assets measured at fair value through other comprehensive income	(9,592,392)	-	-	-
Share of other comprehensive income (loss) of joint ventures	10 224,643,094	(85,407,851)	-	-
Share of other comprehensive loss of associates	11 (55,376,370)	(1,911,962)	-	-
<b>OTHER COMPREHENSIVE INCOME (LOSS) FOR THE YEAR, NET OF TAX</b>	<u>474,419,695</u>	<u>(1,876,287,635)</u>	<u>(151,527,578)</u>	<u>(448,711,946)</u>
<b>TOTAL COMPREHENSIVE INCOME (LOSS) FOR THE YEAR</b>	<u><u>1,126,299,535</u></u>	<u><u>10,473,009,035</u></u>	<u><u>(3,531,075,096)</u></u>	<u><u>8,704,363,284</u></u>
<b>TOTAL COMPREHENSIVE INCOME (LOSS) ATTRIBUTABLE TO</b>				
Owners of the parent	642,584,328	9,840,397,339	(3,531,075,096)	8,704,363,284
Non-controlling interests	483,715,207	632,611,696	-	-
	<u><u>1,126,299,535</u></u>	<u><u>10,473,009,035</u></u>	<u><u>(3,531,075,096)</u></u>	<u><u>8,704,363,284</u></u>

Notes to the financial statements form an integral part of these statements

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES  
STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY  
FOR THE YEAR ENDED DECEMBER 31, 2020

Unit : Baht

Notes	Consolidated financial statements																				
	Retained earnings											Other components of shareholders' equity									
	Issued and paid-up share capital	Treasury stock	Premium on ordinary shares	Premium on treasury stock	Difference arising from business combination under common control	Difference arising from the change in the ownership interest in an investment	Put option over non-controlling interest	Legal reserve	Loans repayment reserve	Projects expansion reserve	Treasury stock reserve	Unappropriated	Exchange differences on translating financial statements	Gain (loss) on remeasurement of investments in financial assets measured at fair value through other comprehensive income	Gain (loss) on arising on hedging instruments from cash flow hedges	Share of other comprehensive income (loss) of joint ventures	Share of other comprehensive income (loss) of associates	Total other components of shareholders' equity	Total attributions to owners of the parent	Non-controlling interests	Total shareholders' equity
<b>BALANCE AS AT JANUARY 1, 2019</b>	45,088,491,170	-	36,936,829,684	1,386,740,109	1,690,706,891	-	-	4,512,930,269	807,802,564	12,446,994,126	-	192,959,190,549	(480,236,466)	51,683,707	15,126,679	607,711,607	21,791,680	216,077,207	296,045,762,569	7,436,445,365	303,482,207,934
Treasury stock purchased	27	-	(1,187,603,325)	-	-	-	-	-	-	-	1,187,603,325	-	-	-	-	-	-	-	(1,187,603,325)	-	(1,187,603,325)
Dividends paid	34	-	-	-	-	-	-	-	-	-	-	(15,779,901,765)	-	-	-	-	-	-	(15,779,901,765)	(556,380,393)	(16,336,282,158)
Increase investment in a subsidiary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	252,501,875	252,501,875
Difference arising from the change in the ownership interest in an investment	11	-	-	-	-	(3,407,679,334)	-	-	-	-	-	-	-	-	-	-	-	-	(3,407,679,334)	-	(3,407,679,334)
Interests in equity of associate	-	-	-	-	-	-	-	-	-	-	-	319,194,149	-	-	-	-	-	-	319,194,149	-	319,194,149
Profit for the year	-	-	-	-	-	-	-	-	-	-	-	11,682,079,566	-	-	-	-	-	-	11,682,079,566	667,217,104	12,349,296,670
Other comprehensive income (loss)	-	-	-	-	-	-	-	-	-	-	-	(138,209,637)	(644,186,753)	33,877,577	(263,686,596)	(446,306,794)	(383,170,024)	(1,703,472,590)	(1,841,682,227)	(34,605,408)	(1,876,287,635)
<b>BALANCE AS AT DECEMBER 31, 2019</b>	<b>45,088,491,170</b>	<b>(1,187,603,325)</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>1,690,706,891</b>	<b>(3,407,679,334)</b>	<b>-</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>1,187,603,325</b>	<b>187,854,749,537</b>	<b>(1,124,423,219)</b>	<b>85,561,284</b>	<b>(248,559,917)</b>	<b>161,404,813</b>	<b>(361,378,344)</b>	<b>(1,487,395,383)</b>	<b>285,830,169,633</b>	<b>7,765,178,543</b>	<b>293,595,348,176</b>
<b>BALANCE AS AT JANUARY 1, 2020</b> - AS PREVIOUSLY REPORTED	45,088,491,170	(1,187,603,325)	36,936,829,684	1,386,740,109	1,690,706,891	(3,407,679,334)	-	4,512,930,269	807,802,564	12,446,994,126	1,187,603,325	187,854,749,537	(1,124,423,219)	85,561,284	(248,559,917)	161,404,813	(361,378,344)	(1,487,395,383)	285,830,169,633	7,765,178,543	293,595,348,176
Effects from first-time adoption of new accounting policies	2.6	-	-	-	-	-	(1,286,083,982)	-	-	-	-	501,104,973	-	(71,362,242)	-	(3,255,570)	(111,721,683)	(186,339,495)	(971,318,504)	-	(971,318,504)
<b>BALANCE AS AT JANUARY 1, 2020</b> - RESTATED	45,088,491,170	(1,187,603,325)	36,936,829,684	1,386,740,109	1,690,706,891	(3,407,679,334)	(1,286,083,982)	4,512,930,269	807,802,564	12,446,994,126	1,187,603,325	188,355,854,510	(1,124,423,219)	14,199,042	(248,559,917)	158,149,243	(473,100,027)	(1,673,734,878)	284,858,851,129	7,765,178,543	292,624,029,672
Dividends paid	34	-	-	-	-	-	-	-	-	-	-	(4,486,328,157)	-	-	-	-	-	-	(4,486,328,157)	(537,692,786)	(5,024,020,943)
Increase investment in a subsidiary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	267,651,233	267,651,233
Profit for the year	-	-	-	-	-	-	-	-	-	-	-	199,606,690	-	-	-	-	-	-	199,606,690	452,273,150	651,879,840
Other comprehensive income (loss)	-	-	-	-	-	-	-	-	-	-	-	(416,810,464)	210,617,614	(27,189,749)	275,037,181	339,258,608	62,064,448	859,788,102	442,977,638	31,442,057	474,419,695
<b>BALANCE AS AT DECEMBER 31, 2020</b>	<b>45,088,491,170</b>	<b>(1,187,603,325)</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>1,690,706,891</b>	<b>(3,407,679,334)</b>	<b>(1,286,083,982)</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>1,187,603,325</b>	<b>183,652,322,579</b>	<b>(913,805,605)</b>	<b>(12,990,707)</b>	<b>26,477,264</b>	<b>497,407,851</b>	<b>(411,035,579)</b>	<b>(813,946,776)</b>	<b>281,015,107,300</b>	<b>7,978,852,197</b>	<b>288,993,959,497</b>

Notes to the financial statements form an integral part of these statements

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES  
STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY (CONTINUED)  
FOR THE YEAR ENDED DECEMBER 31, 2020

Unit : Baht

Notes	Separate financial statements										Other components of shareholders' equity							
	Retained earnings										Gain (loss) on remeasurement of investments in financial assets measured at fair value through other comprehensive income				Gain (loss) on hedging instruments from cash flow hedges		Total other components of shareholders' equity	
	Issued and paid-up share capital	Treasury stock	Premium on ordinary shares	Premium on treasury stock	Difference arising from combination under business common control	Legal reserve	Loans repayment reserve	Projects expansion reserve	Treasury stock reserve	Unappropriated	income	hedges	equity	equity				
<b>BALANCE AS AT JANUARY 1, 2019</b>	45,088,491,170	-	36,936,829,684	1,386,740,109	77,453,518	4,512,930,269	807,802,564	12,446,994,126	-	171,114,157,807	51,683,707	413,698,237	465,381,944	272,836,781,191				
Treasury stock	27	-	(1,187,603,325)	-	-	-	-	-	1,187,603,325	(1,187,603,325)	-	-	-	(1,187,603,325)				
Dividends paid	34	-	-	-	-	-	-	-	-	(15,779,901,765)	-	-	-	(15,779,901,765)				
Profit for the year		-	-	-	-	-	-	-	-	9,153,075,230	-	-	-	9,153,075,230				
Other comprehensive income (loss)		-	-	-	-	-	-	-	-	-	33,877,577	(482,589,523)	(448,711,946)	(448,711,946)				
<b>BALANCE AS AT DECEMBER 31, 2019</b>	<u>45,088,491,170</u>	<u>(1,187,603,325)</u>	<u>36,936,829,684</u>	<u>1,386,740,109</u>	<u>77,453,518</u>	<u>4,512,930,269</u>	<u>807,802,564</u>	<u>12,446,994,126</u>	<u>1,187,603,325</u>	<u>163,299,727,947</u>	<u>85,561,284</u>	<u>-68,891,286</u>	<u>16,669,998</u>	<u>264,573,639,385</u>				
<b>BALANCE AS AT JANUARY 1, 2020</b>																		
-AS PREVIOUSLY REPORTED	45,088,491,170	(1,187,603,325)	36,936,829,684	1,386,740,109	77,453,518	4,512,930,269	807,802,564	12,446,994,126	1,187,603,325	163,299,727,947	85,561,284	(68,891,286)	16,669,998	264,573,639,385				
Effects from first-time adoption of new accounting policies	2.6	-	-	-	-	-	-	-	-	(150,163,446)	(67,192,771)	-	(67,192,771)	(217,356,217)				
<b>BALANCE AS AT JANUARY 1, 2020</b>																		
-RESTATE	45,088,491,170	(1,187,603,325)	36,936,829,684	1,386,740,109	77,453,518	4,512,930,269	807,802,564	12,446,994,126	1,187,603,325	163,149,564,501	18,368,513	(68,891,286)	(50,522,773)	264,356,283,168				
Dividends paid	34	-	-	-	-	-	-	-	-	(4,486,328,157)	-	-	-	(4,486,328,157)				
Loss for the year		-	-	-	-	-	-	-	-	(3,379,547,518)	-	-	-	(3,379,547,518)				
Other comprehensive income (loss)		-	-	-	-	-	-	-	-	(216,626,068)	(17,597,358)	82,695,848	65,098,490	(151,527,578)				
<b>BALANCE AS AT DECEMBER 31, 2020</b>	<u>45,088,491,170</u>	<u>(1,187,603,325)</u>	<u>36,936,829,684</u>	<u>1,386,740,109</u>	<u>77,453,518</u>	<u>4,512,930,269</u>	<u>807,802,564</u>	<u>12,446,994,126</u>	<u>1,187,603,325</u>	<u>155,067,062,758</u>	<u>771,155</u>	<u>13,804,562</u>	<u>14,575,717</u>	<u>256,338,879,915</u>				

Notes to the financial statements form an integral part of these statements

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

STATEMENTS OF CASH FLOWS

FOR THE YEAR ENDED DECEMBER 31, 2020

Unit : Baht

	Consolidated		Separate	
	financial statements		financial statements	
	2020	2019	2020	2019
<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>				
Profit (loss) for the year	651,879,840	12,349,296,670	(3,379,547,518)	9,153,075,230
Adjustments for:				
Income tax (benefit) expense	(109,285,418)	649,361,925	(659,318,891)	74,349,225
Depreciation and amortization	20,291,818,509	19,197,797,105	14,322,549,643	13,366,391,225
Investment income	(394,040,492)	(1,000,821,422)	(3,532,784,229)	(5,195,501,283)
Gain on settlement of borrowings	-	(211,556,237)	-	-
Loss from capital distribution of subsidiaries	-	-	-	69,799
Loss from sale of investment in an associate	-	13,115,757	-	-
Finance costs	3,511,095,162	3,119,419,221	3,276,306,464	2,618,771,176
Unrealised gain on derivatives	(762,191,080)	(54,827,103)	(266,620,570)	(19,990,128)
(Gain) loss on foreign exchange rates	145,131,878	(2,518,930,371)	(102,674,163)	(2,279,982,317)
Loss on remeasurement of investments in financial assets				
measured at fair value	31,687,661	-	31,687,661	-
Bad debt and doubtful debt expenses	18,605,911	172,882,726	8,870,997	159,994,458
(Reversal of) loss on obsolete inventories	(10,485,624)	(83,122,717)	4,800,289	(50,921,726)
Reversal of loss on inventories devaluation	(275,457,874)	(1,060,886,068)	(236,874,043)	(1,089,977,606)
Reversal of expenses from raw materials derogation	-	(232,483,965)	-	-
Loss from written-off of assets	84,007,489	52,766,502	36,134,970	69,384,731
(Reversal of) impairment losses on assets	(312,702,016)	-	-	63,052,760
(Gain) loss on disposal of property, plant and equipment	109,796,962	40,554,053	36,950,764	(7,941,860)
Gain on disposal of right-of-use assets	(1,707,247)	-	(2,510,573)	-
Provision for employee benefits	592,025,240	1,501,638,645	425,344,122	1,156,107,086
Other revenues	(11,388,015)	(8,369,972)	(10,910,452)	(9,792,233)
Gain on bargain purchases	-	(31,482,857)	-	-
Share of profit of investments in joint ventures	(863,193,963)	(2,625,714,096)	-	-
Share of profit of investments in associates	(2,459,356,255)	(1,933,059,453)	-	-
Profit from operations before changes in				
operating assets and liabilities	20,236,240,668	27,335,578,343	9,951,404,471	18,007,088,537
Operating assets (increase) decrease				
Trade receivables	4,840,046,689	7,688,772,097	5,368,317,930	6,769,976,249
Other receivables	(317,538,768)	655,357,356	32,091,018	504,402,338
Inventories	5,003,944,314	4,206,895,474	4,011,782,026	3,795,750,644
Value-added tax receivable	713,859,858	456,218,332	492,422,615	134,764,625
Other current assets	(292,450,496)	1,216,416,609	(129,871,876)	1,346,221,634
Other non-current assets	(223,918,175)	(121,134,464)	3,976,372	(24,216,553)
Operating liabilities increase (decrease)				
Trade payables	(5,513,946,257)	(8,962,108,450)	(5,108,399,197)	(7,540,342,464)
Other payables	(1,546,144,943)	(405,767,945)	(2,176,382,563)	(2,731,219,413)
Current provisions	(65,887,076)	38,484,724	-	-
Other current liabilities	(16,183,807)	(10,756,357)	-	-
Cash paid for provisions for employee benefits	(240,429,549)	(233,434,021)	(141,782,676)	(157,074,878)
Other non-current provisions	23,040,419	(30,534,035)	-	-
Other non-current liabilities	(13,346,055)	(105,677,642)	(8,900,807)	(122,090,260)
Cash received from operations	22,587,286,822	31,728,310,021	12,294,657,313	19,983,260,459
Cash (paid) received for income tax	(441,525,689)	(1,553,273,997)	203,609,645	(959,971,523)
Net cash flows provided by operating activities	22,145,761,133	30,175,036,024	12,498,266,958	19,023,288,936

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF CASH FLOWS (CONTINUED)**  
**FOR THE YEAR ENDED DECEMBER 31, 2020**

Unit : Baht

	Consolidated		Separate	
	financial statements		financial statements	
	2020	2019	2020	2019
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>				
Interest received	345,062,304	970,074,693	291,907,332	796,872,684
Dividends received	2,762,834,580	2,247,743,282	3,201,503,566	4,372,126,568
Acquisition of property, plant and equipment and intangible assets	(25,059,291,918)	(40,816,927,040)	(14,897,302,064)	(22,996,121,309)
Proceeds from sale of property, plant and equipment	112,161,140	129,650,962	31,815,106	118,513,574
Acquisition of other non-current assets	-	(6,981,143)	-	-
Decrease of held-to-maturities debt securities	-	4,245,796,605	-	240,351,300
Decrease of available-for-sale securities	-	10,368,985,604	-	10,368,985,604
Increase of investments in financial assets in debt instruments	(7,628,656,269)	-	(9,954,679,903)	-
Cash paid for investments in financial assets in equity instruments	(123,242,102)	-	-	-
Cash received from sales of investments in financial assets in equity instruments	182,576,677	-	182,576,677	-
Acquisition of investments in subsidiaries, joint ventures and associates	(1,549,450,000)	(19,061,859,511)	(4,668,357,405)	(22,562,924,510)
Cash received from sale of investment in an associate	-	212,663,057	-	-
Cash received from capital distribution of subsidiaries	-	-	-	1,927,949
Cash paid for other non-marketable equity securities	-	(259,855,403)	-	(1,125,000)
Cash received from sales of other non-marketable equity securities	-	28,289,253	-	28,289,253
Proceeds from short-term loans to related parties	1,122,984,335	7,101,928,666	1,122,984,335	7,279,289,288
Increase in short-term loans to related parties	-	(8,000,000,000)	(1,972,158,712)	(8,000,000,000)
Proceeds from long-term loans to related parties	1,560,553,399	1,827,494,000	1,560,553,399	1,827,494,000
Increase in long-term loans to related parties	-	(766,981,093)	-	(766,981,093)
Net cash flows used in investing activities	(28,274,467,854)	(41,779,978,068)	(25,101,157,669)	(29,293,301,692)
<b>CASH FLOWS FROM FINANCING ACTIVITIES</b>				
Finance costs paid	(3,364,687,807)	(2,917,779,970)	(3,141,230,556)	(2,449,463,098)
Dividends paid	(5,024,020,943)	(16,336,282,158)	(4,486,328,157)	(15,779,901,765)
Repayment of lease liabilities	(982,065,003)	(175,771,913)	(1,056,547,971)	(121,544,992)
Proceeds from short-term borrowings from financial institutions	10,400,000	144,468,261	-	-
Proceeds from short-term borrowings from related parties	-	-	2,587,547,946	1,579,522,387
Proceeds from long-term borrowings from financial institutions	36,108,345,000	13,237,281,710	30,000,000,000	-
Proceeds from long-term borrowings from other parties	-	15,637,595	-	-
Repayment of short-term borrowings from financial institutions	(2,036,354,170)	(1,425,000,000)	-	-
Repayment of short-term borrowings from related parties	-	-	(20,924,678)	(469,497,207)
Repayment of long-term borrowings from financial institutions	(8,142,495,000)	(16,083,908,280)	(7,111,495,000)	(4,280,202,000)
Repayment of long-term borrowings from other parties	(42,929,835)	(42,186,998)	-	-
Proceeds from increase in investment in a subsidiary from non-controlling interests	267,651,233	252,501,875	-	-
Proceeds from debentures	15,000,000,000	20,000,000,000	15,000,000,000	20,000,000,000
Repayment of debentures	-	(1,942,000,000)	-	(1,942,000,000)
Cash paid for treasury stock	-	(1,187,603,325)	-	(1,187,603,325)
Net cash flows provided by (used in) financing activities	31,793,843,475	(6,460,643,203)	31,771,021,584	(4,650,690,000)



**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF CASH FLOWS (CONTINUED)**  
**FOR THE YEAR ENDED DECEMBER 31, 2020**

	Unit : Baht			
	Consolidated		Separate	
	financial statements		financial statements	
	2020	2019	2020	2019
Net increase (decrease) in cash and cash equivalents, before effect from foreign exchange rate	25,665,136,754	(18,065,585,247)	19,168,130,873	(14,920,702,756)
Effect from foreign exchange rate in cash and cash equivalents and effect from translation differences on financial statements	(192,416,843)	161,848,944	(30,257,435)	176,139,833
Net increase (decrease) in cash and cash equivalents	25,472,719,911	(17,903,736,303)	19,137,873,438	(14,744,562,923)
Cash and cash equivalents as at January 1,	18,840,303,824	36,744,040,127	12,397,417,335	27,141,980,258
<b>Cash and cash equivalents as at December 31,</b>	<b>44,313,023,735</b>	<b>18,840,303,824</b>	<b>31,535,290,773</b>	<b>12,397,417,335</b>
<b>Non-cash items</b>				
Payables to contractors	2,955,798,483	2,717,169,778	2,020,050,501	2,778,691,141

Notes to the financial statements form an integral part of these statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**NOTES TO THE FINANCIAL STATEMENTS**  
**FOR THE YEAR ENDED DECEMBER 31, 2020**

<b>Notes</b>	<b>Contents</b>
1.	The Company's operations and general information
2.	Basis for preparation and presentation of the financial statements
3.	Significant accounting policies
4.	Acquisition of businesses
5.	Cash and cash equivalents
6.	Trade receivables
7.	Other receivables
8.	Inventories
9.	Investments in subsidiaries
10.	Investments in joint ventures
11.	Investments in associates
12.	Other investments and investments in financial assets
13.	Investment properties
14.	Property, plant and equipment
15.	Right-of-use assets
16.	Land leasehold right
17.	Goodwill
18.	Intangible assets
19.	Income tax expense and deferred tax
20.	Borrowings and debentures
21.	Lease liabilities
22.	Trade payables
23.	Other payables
24.	Provisions for employee benefits
25.	Share capital
26.	Additional paid-in capital and reserves
27.	Treasury stock
28.	Transactions with related parties
29.	Financial information by segment
30.	Expenses by nature
31.	Finance costs
32.	Promotional privileges
33.	Basic earnings (loss) per share
34.	Dividends paid
35.	Financial instruments
36.	Commitments with non-related parties
37.	Litigations
38.	Event after the reporting period
39.	Approval of the financial statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**NOTES TO THE FINANCIAL STATEMENTS**  
**FOR THE YEAR ENDED DECEMBER 31, 2020**

**1. THE COMPANY'S OPERATIONS AND GENERAL INFORMATION**

PTT Global Chemical Public Company Limited (the "Company") was registered on October 19, 2011 in accordance with the Public Company Limited Act, B.E. 2535. The Board of Governors of the SET approved the listing of the Company on the day that the Registrar accepted the registration on October 19, 2011.

The Company is a company in the PTT Public Company Limited ("PTT") group of companies. PTT is incorporated in Thailand and is the major shareholder of the Company, holding 45.41% of the Company's issued and paid-up share capital.

The Company is incorporated in Thailand and has its registered offices as follows:

Head Office	: 555/1, Energy Complex, Building A, 14th - 18th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand
Branch 1 (Rayong office Branch)	: 59, Radniyom Road, Tambon Noenphra, Amphoe Mueang Rayong, Rayong, Thailand
Branch 2 (Olefin 1 Branch)	: 14, I-1 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 3 (Olefin 2 Branch)	: 9, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 4 (Aromatics 1 Branch)	: 4, I-2 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 5 (Aromatics 2 Branch)	: 98/9, Rayong 3191 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 6 (Refining Branch)	: 8, I-8 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 7 (Jetty and Buffer Tank Farm Branch)	: 19, Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 8 (Aromatics reserve Branch)	: 11, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 9 (Lab Service Center Branch)	: 24/9, Pakorn Songkrao-Rat Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 10 (PTTGC 10 Branch)	: 555/1, Energy Complex, Building A, 1st and 10th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand
Branch 11 (Olefin 3 Branch)	: 8, Phadang Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 12 (Polyethylene Branch)	: 8, Map Ta Phut Industrial Estate, I-10 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 13 (Innoplus Solution Center Branch)	: 83/9-10, Moo 5, Tambon Tabma, Amphoe Mueang Rayong, Rayong, Thailand
Branch 14 (Maintenance office)	: 32, Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand

The principal businesses of the Company are refining and provision of integrated petroleum products, production and distribution of aromatics products including aromatic derivatives and production and distribution of ethylene, propylene, polyethylene plastic pellets and biochemical products. By-products are mixed C4, cracker bottom and tail gas. Minor activities are production and distribution of electricity, water, steam and other utilities. In addition, the Company also operates production support facilities such as jetty and buffer tank farm services for liquid chemical, oil and gas.

### Coronavirus Disease 2019 Pandemic

The Coronavirus disease 2019 (“COVID-19”) pandemic is continuing to evolve, resulting in an economic slowdown and adversely impacting most businesses and industries. This situation may bring uncertainties and have an impact on the operating environment. The Company and its subsidiaries’ (the “Group”) management considered that there is no financial impact in respect of valuation of assets, provisions and contingent liabilities. However, the Group’s management will continue to monitor the ongoing situation.

## 2. BASIS FOR PREPARATION AND PRESENTATION OF THE FINANCIAL STATEMENTS

- 2.1 The Group maintains its accounting records in Thai Baht and prepares its statutory financial statements in the Thai language in conformity with Thai Financial Reporting Standards (TFRS) and accounting practices generally accepted in Thailand.
- 2.2 The Group’s financial statements have been prepared in accordance with the Thai Accounting Standard (TAS) No. 1 “Presentation of Financial Statements”, which was effective for financial periods beginning on or after January 1, 2020 onward, and the Regulation of The Stock Exchange of Thailand (SET) dated October 2, 2017, regarding the preparation and submission of financial statements and reports for the financial position and results of operations of the listed companies B.E. 2560 and the Notification of the Department of Business Development regarding “The Brief Particulars in the Financial Statements (No.3) B.E. 2562” dated December 26, 2019.
- 2.3 The financial statements have been prepared under the historical cost convention except as disclosed in the significant accounting policies.
- 2.4 An English version of the financial statements have been prepared from the financial statements that is in the Thai language under law. In the event of a conflict or a difference in interpretation between the two languages, the Thai language financial information shall prevail.
- 2.5 The consolidated financial statements included the accounts of the Group, after elimination of intercompany transactions, of which the percentage of shareholding as at December 31, 2020 and 2019, are as follows:

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2020</u>	<u>2019</u>
<i>Direct subsidiaries</i>				
Global Green Chemicals Plc.	Manufacturing and distributing biochemical products	Thailand	72.29	72.29
GC Glycol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Polyols Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	82.10	82.10
GC Marketing Solutions Co., Ltd.	Development, marketing and distributing polymers products, by-products and other polymers-related products	Thailand	100	100
GC Maintenance and Engineering Co., Ltd.	Factory maintenance and engineering services	Thailand	100	100

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2020</u>	<u>2019</u>
GC Logistics Solutions Co., Ltd.	Transportation, warehouse and bagging packing management of polyethylene plastic pellets	Thailand	100	100
GC Ventures Co., Ltd.	Invest in form of Corporate Venture Capital (CVC)	Thailand	100	100
GC Treasury Center Co., Ltd.	Financial service management for the group	Thailand	100	100
GC Styrenics Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Oxirane Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC-M PTA Co., Ltd. (49% Direct interest and 25% Indirect interest)	Manufacturing and distributing petrochemical products	Thailand	74	74
GC Estate Co., Ltd.	Real estate development for rent and to invest in petrochemical and related industries	Thailand	100	100
Solution Creation Co., Ltd.	Manufacturing and distributing petrochemical products and health and nutrition products	Thailand	100	100
Thai Tank Terminal Limited	Service for the storage and handling of liquid chemicals, oil and gas	Thailand	51	51
PTT Phenol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
NPC Safety and Environmental Service Co., Ltd.	Safety and environmental services	Thailand	100	100
Envicco Co., Ltd.	Manufacturing, distributing and developing recycled plastic and by-products	Thailand	70	-
PTTGC America Corporation	Holding and operating international business	United States of America	100	100
PTTGC International Private Limited	Holding and operating international business	Singapore	100	100

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2020</u>	<u>2019</u>
<i>Indirect subsidiaries</i>				
GGC Biochemicals Co., Ltd.	Holding and operating in Thailand	Thailand	72.29	72.29
Thai Fatty Alcohols Co., Ltd.	Manufacturing and distributing biochemical products	Thailand	72.29	72.29
Thai Pet Resin Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	74	74
PL Global Transport Co., Ltd.	Transportation of polyethylene plastic pellets	Thailand	100	100
NPC S&E Security Guard Co., Ltd.	Safety services	Thailand	100	100
GC Logistics Solutions (Vietnam) Co., Ltd.	Transportation, warehouse and bagging packing management of polyethylene plastic pellets	Vietnam	100	100
GC Ventures America Corporation	Invest in form of Corporate Venture Capital (CVC) outside Thailand	United States of America	100	100
GCM Polymer Trading DMCC	Distributing polymer products and other polymers-related products	United Arab Emirates	100	100
GC Marketing Solutions Myanmar Co., Ltd.	Distributing polymer products and other polymers-related products	Myanmar	100	100
GC Marketing Solutions Vietnam Co., Ltd.	Distributing polymer products and other polymers-related products	Vietnam	100	100
PT GCM Marketing Solutions Indonesia	Distributing polymer products and other polymers-related products	Indonesia	67	67
PTTGC America LLC	Operating petrochemical business	United States of America	100	100
PTTGC Innovation America Corporation	Research and development of bio-based chemicals	United States of America	100	100
PTTGC International (Netherlands) B.V.	Holding and operating international business	Netherlands	100	100
GC International Corporation (Formerly PTTGC International (USA) Inc.)	Holding and operating international business	United States of America	100	100
Vencorex Holding	Manufacturing and distributing chemical specialties	France	90.82	90.82

2.6 Thai Financial Reporting Standards affecting the presentation and disclosure in the current period financial statements

During the year, the Group has adopted the revised and new financial reporting standards and guidelines on accounting issued by the Federation of Accounting Professions which become effective for fiscal years beginning on or after January 1, 2020. These financial reporting standards were aimed at alignment with the corresponding International Financial Reporting Standards, with most of the changes directed towards revision of wording and terminology, and provision of interpretations and accounting guidance to users of standards. The adoption of these financial reporting standards does not have any significant impact on the Group's financial statements, except the following financial reporting standards:

Group of Financial Instruments Standards

**Thai Accounting Standards ("TAS")**

TAS 32 Financial Instruments: Presentation

**Thai Financial Reporting Standards ("TFRS")**

TFRS 7 Financial Instruments: Disclosures

TFRS 9 Financial Instruments

**Thai Financial Reporting Standard Interpretations ("TFRIC")**

TFRIC 16 Hedges of a Net Investment in a Foreign Operation

TFRIC 19 Extinguishing Financial Liabilities with Equity Instruments

The Group's management has adopted these Financial Instruments Standards by recognising the cumulative effect of initially adopting of these TFRSs as an adjustment to the opening balance of retained earnings and other component of shareholders' equity of the reporting period.

The Group's management has assessed the impact of such Financial Instruments Standards, which have the material impact as follows:

- Classification of financial assets.
- Measurement of financial assets as measured at fair value through profit or loss and as measured at fair value through other comprehensive income.
- Designating of a financial liability as measured at fair value through profit or loss.

The total impact on the retained earnings and other components of shareholders' equity as at January 1, 2020 are as follows:

	<u>Consolidated</u> <u>financial statements</u>	<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>
<b>Unappropriated retained earnings</b>		
Unappropriated retained earnings as at		
December 31, 2019	187,855	163,300
Derivatives - net of tax	496	(217)
Financial assets - Fair value through profit or loss - net of tax	5	67
Adjusted unappropriated retained earnings from adoption of TFRS 9 as at January 1, 2020	<u>188,356</u>	<u>163,150</u>
<b>Other components of shareholders' equity</b>		
Other components of shareholders' equity as at		
December 31, 2019	(1,487)	17
Hedge accounting - net of tax	(4)	-
Financial assets - Fair value through profit or loss - net of tax	(67)	(67)
Financial assets - Fair value through other comprehensive income - net of tax	(115)	-
Adjusted other components of shareholders' equity from adoption of TFRS 9 as at January 1, 2020	<u>(1,673)</u>	<u>(50)</u>

The table below presented information relating to financial assets and liabilities that have been reclassified as a result of transition to TFRS 9.

	<u>Consolidated financial statements</u>				<u>Category</u>
	<u>(i)</u> <u>TAS 105</u> <u>Carrying</u> <u>amount</u> <u>as of</u> <u>December 31,</u> <u>2019</u>	<u>(ii)</u> <u>Reclassifications</u>	<u>(iii)</u> <u>Remeasurement's</u>	<u>(iv) =</u> <u>(i)+(ii)+(iii)</u> <u>TFRS 9</u> <u>Carrying</u> <u>amount</u> <u>as of</u> <u>January 1,</u> <u>2020</u>	
<b>Unit : Million Baht</b>					
<b>Assets</b>					
<u>Current</u>					
Temporary investments	6,720	(6,720)	-	-	
Current investment in financial assets	-	6,175	-	6,175	Financial asset measured at amortised cost
Current investment in financial assets	-	545	-	545	Financial asset measured at fair value through other comprehensive income
Derivatives	28	-	194	222	Financial asset measured at fair value through profit or loss
<u>Non-current</u>					
Investment in joint ventures (see Note 10)	32,444	-	(4)	32,440	
Investment in associates (see Note 11)	29,829	-	(173)	29,656	
Other long-term investments	2,911	(2,911)	-	-	
Non-current investments in financial assets	-	450	-	450	Financial asset measured at amortised cost
Non-current investments in financial assets	-	414	-	414	Financial asset measured at fair value through profit or loss
Non-current investments in financial assets	-	2,047	(4)	2,043	Financial asset measured at fair value through other comprehensive income
<b>Liabilities</b>					
<u>Current</u>					
Derivatives	320	-	466	786	Financial liability measured at fair value through profit or loss
<u>Non-current</u>					
Derivatives	12	-	573	585	Financial liability measured at fair value through profit or loss
Deferred tax liabilities	2,465	-	(55)	2,410	
<b>Shareholders' equity</b>					
Put option over non-controlling interest <sup>1)</sup>	-	-	(1,286)	(1,286)	
Unappropriated retained earnings	187,855	-	501	188,356	
Other components of shareholders' equity	(1,487)	-	(186)	(1,673)	

<sup>1)</sup> Put option over non-controlling interest is a present value of expected payments at the acquisition date. Under the securityholders agreement, non-controlling interest is granted the right to sell the remaining 9.18% holding in Vencorex Holding with conditions and exercise prices as stipulated in the agreement.



Unit : Million Baht

	<b>Separate financial statements</b>				<b>Category</b>
	<b>(i) TAS 105 Carrying amount as of December 31, 2019</b>	<b>(ii) Reclassifications</b>	<b>(iii) Remeasurements</b>	<b>(iv) = (i)+(ii)+(iii) TFRS 9 Carrying amount as of January 1, 2020</b>	
<b>Assets</b>					
<b>Current</b>					
Temporary investments	4,045	(4,045)	-	-	
Current investments in financial assets	-	3,500	-	3,500	Financial asset measured at amortised cost
Current investments in financial assets	-	545	-	545	Financial asset measured at fair value through other comprehensive income
Derivatives	14	-	194	208	Financial asset measured at fair value through profit or loss
<b>Non-current</b>					
Other long-term investments	2,341	(2,341)	-	-	
Non-current investments in financial assets	-	450	-	450	Financial asset measured at amortised cost
Non-current investments in financial assets	-	384	-	384	Financial asset measured at fair value through profit or loss
Non-current investments in financial assets	-	1,507	-	1,507	Financial asset measured at fair value through other comprehensive income
<b>Liabilities</b>					
<b>Current</b>					
Derivatives	69	-	466	535	Financial liability measured at fair value through profit or loss
<b>Non-current</b>					
Deferred tax liabilities	1,592	-	(55)	1,537	
<b>Shareholders' equity</b>					
Unappropriated retained earnings	163,300	-	(150)	163,150	
Other components of shareholders' equity	17	-	(67)	(50)	

#### Thai Financial Reporting Standard No. 16 “Leases”

This TFRS provides a comprehensive model for the identification of lease arrangements and their treatment in the financial statements of both lessees and lessors and supersedes the relating to lease, Standards and Interpretations upon its effective date, which are Thai Accounting Standard No.17 “Leases” (“TAS 17”), Thai Accounting Standard Interpretation No.15 “Operating Lease - Incentives”, Thai Accounting Standard Interpretation No.27 “Evaluating the Substance of Transactions involving the Legal Form of a Lease” and Thai Financial Reporting Standard Interpretation No.4 “Determining whether on Arrangement contains a Lease”.

This TFRS does not significantly change the lease accounting for lessor.

For lessee accounting, there are significant changes to lease accounting in this TFRS by removing the distinction between operating and finance leases under TAS 17 and requiring a lessee to recognise a right-of-use asset and a lease liability at commencement for all leases, except for short-term leases and leases of low value assets. However, the lessor accounting treatment continues to require a lessor to classify a lease either as an operating lease or a finance lease, using the same concept as TAS 17. Details of these new requirements are described in Note 3.11. The impact of the adoption of TFRS 16 on the Group’s consolidated financial statements is described below.

The date of initial application of TFRS 16 “Leases” is January 1, 2020.

The Group’s management adopt this TFRS as following:

- Recognises lease liability at the date of initial application for all lease previously classified as operating lease under TAS 17. The lessee measures the lease liability at the present value of the remaining lease payment, discounted by using the rate implicit in the lease. If this rate cannot be readily determined, the Group uses its incremental borrowing rate at the date of initial application.
- Recognises right-of-use asset at the date of initial application for all lease previously classified as operating lease under TAS 17. The lessee measures the right-of-use asset by lease contract at the lease liability value, adjusted by the amount of any prepaid or accrued lease payments correspondent to the lease contract recognised in the statement of financial position before the date of initial application.
- The Group applied a single discount rate to a portfolio of leases with reasonably similar characteristics.
- The Group elected not to recognise right-of-use assets and lease liabilities to leases for which the lease term is not over 12 months from the date of initial application, which recognise the lease payments as operating expense on a straight-line basis over the term of the lease.

Financial impact of the initial application of TFRS 16 “Leases” (“TFRS 16”)

The Group applied TFRS 16 using the cumulative effect and did not restated the comparative information according to TAS 17.

The following table presented the operating lease commitments disclosed by applying TAS 17 as at December 31, 2019, using the discounted rate and the lease liabilities recognised in the statement of financial position at the date of initial application.

	<u>Consolidated</u> <u>financial statements</u>	<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>
Operating lease commitments as at December 31, 2019	5,241	4,975
Effect of discounting the above amounts	(1,039)	(900)
Liabilities from rights to extend lease period	187	-
<b>Lease liabilities recognised as at January 1, 2020</b>	<b><u>4,389</u></b>	<b><u>4,075</u></b>
Right-of-use assets recognised as at January 1, 2020	4,389	4,075
Reclassified to be right-of-use assets:		
Prepaid expenses	175	100
Property, plant and equipment (see Note 14)	376	275
Land leasehold rights	184	184
Intangible assets	151	87
<b>Right-of-use assets as at January 1, 2020 (see Note 15)</b>	<b><u>5,275</u></b>	<b><u>4,721</u></b>

The discount rate used in the lease liabilities assessment recognised in the statement of financial position is between 2.10% - 3.80% per annum.

The Group and the Company have reclassified the lease liabilities in the consolidated and separate financial statements as at December 31, 2019 as follows:

<u>Account name</u>	Unit : Million Baht			
	<u>Previous presentation</u>	<u>Current presentation</u>	<u>Consolidated financial statements</u>	<u>Separate financial statements</u>
Current portion of finance lease liabilities	Other payables	Current portion of lease liabilities	186,734,336	140,987,006
Finance lease liabilities	Other non-current liabilities	Lease liabilities	214,528,410	148,195,224

## 2.7 Thai Financial Reporting Standards announced in the Royal Gazette but not yet effective

The Federation of Accounting Professions has issued the Notification regarding Thai Financial Reporting Standards (TFRSs) that will be effective for the financial statements for the period beginning on or after January 1, 2021 onwards, which has been announced in the Royal Gazette on September 17, 2020. These financial reporting standards were aimed at alignment with the corresponding International Financial Reporting Standards, with most of the changes directed towards revisions to references to the Conceptual Framework in TFRSs, the amendment for definition of business, the amendment for definition of materiality and accounting requirements for interest rate reform.

Thai Financial Reporting Standard No.16 “Leases” (“TFRS 16”) has been amended for the Rent Concessions related to COVID-19, which is effective from June 1, 2020 with earlier application permitted. The amendment permits lessees, as a practical expedient, not to assess whether rent concessions that occur as a direct consequence of the COVID-19 pandemic and meet specified conditions are lease modifications and, instead, to account for those rent concessions as if they were not lease modifications. In addition, the revised TFRS 16 also added the requirements for the temporary exception arising from interest rate benchmark reform, which an entity shall apply these amendments for the reporting periods beginning on or after January 1, 2022 with earlier application permitted. This revised TFRS 16 has been announced in the Royal Gazette on January 27, 2021.

The Group’s management will adopt the relevant TFRSs in the preparation of Group’s financial statements when they become effective. Also, the Group’s management is on the evaluating process to assess the impact of these TFRSs on the financial statements of the Group in the period of initial application.

## 3. SIGNIFICANT ACCOUNTING POLICIES

The significant accounting policies are as follows:

### 3.1 Basis of consolidation

The consolidated financial statements relate to the Company and its subsidiaries and the Group’s interests in joint ventures and associates.

#### *Business combinations*

The Group applies the acquisition method for all business combinations when control is transferred to the Group, as describe in subsidiaries section, other than those with entities under common control.

The Group recognises goodwill at the acquisition date measured as the excess of (1) over (2) as:

(1) The aggregate of:

- the fair value of the consideration transferred;
- the recognised amount of any non-controlling interests in the acquiree; and
- if the business combination is achieved in stages, the fair value of the existing equity interest in the acquiree.

(2) The net fair value of the identifiable assets acquired and liabilities assumed.

If value of (1) is less than (2), difference is contributed to gain on bargain purchase and recognised immediately in profit or loss.

The consideration transferred is recognised at fair value at the acquisition date.

Transaction costs that the Group incurs in connection with a business combination, such as legal fees, and other professional and consulting fees are expensed as incurred.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period, or additional assets or liabilities are recognised, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognised at that date.

#### *Acquisitions from entities under common control*

Business combinations under common control are accounted for using a method similar to the pooling of interest method. Under that method the acquirer recognises assets and liabilities of the acquired businesses at their carrying amounts in the consolidated financial statements of the ultimate parent company at the moment of the transaction. The difference between the carrying amounts of the acquired net assets and the consideration transferred is recognised as surplus or discount from business combinations under common control in shareholder's equity. The surplus or discount will be transferred to retained earnings upon divestment of the businesses acquired.

The results from operations of the acquired businesses will be included in the consolidated financial statements of the acquirer from the beginning of the comparative period or the moment the businesses came under common control, whichever date is later, until control ceases.

#### *Subsidiaries*

Subsidiaries are entities controlled by the Group. The Group controls an entity when it has rights to variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

#### *Non-controlling interests*

At the acquisition date, the Group measures any non-controlling interest at its proportionate interest in the identifiable net assets of the acquiree.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

#### *Loss of control*

When the Group loses control over a subsidiary, it derecognises the assets and liabilities of the subsidiary, and any related non-controlling interests and other components of equity. Any resulting gain or loss is recognised in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

#### *Interests in equity-accounted investees*

The Group's interests in equity-accounted investees comprise interests in joint ventures and associates.

A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than the rights to its assets and obligations for its liabilities. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies.

Interests in joint ventures and associates are accounted for using the equity method. They are recognised initially at cost. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and other comprehensive income of equity-accounted investees, until the date on which joint control or significant influence ceases.

*Transactions eliminated on consolidation*

Intra-group balances and transactions and any unrealised income or expenses arising from intra-group transactions are eliminated in the preparing of the consolidated financial statements. Unrealised gains and losses arising from transactions with joint ventures and associates are eliminated against the investment to the extent of the Group's interest in the investee.

3.2 Foreign currencies

*Foreign currency transactions*

Transactions in foreign currencies are translated to the respective functional currency of Group entities at exchange rate at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate at the reporting date.

Non-monetary assets and liabilities measured at cost in foreign currencies are translated to the functional currency at the exchange rate at the dates of the transactions.

Foreign currency differences arising on retranslation are generally recognised in profit or loss. However, foreign currency differences arising from the translation of qualifying cash flow hedges to the extent that the hedges are effective are recognised in other comprehensive income.

*Foreign operations*

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition of foreign operations, are translated to Thai Baht at the exchange rates at the end of the reporting date.

The revenues and expenses of foreign operations are translated to Thai Baht at the average rates during the year.

Foreign exchange differences are recognised in other comprehensive income and presented in the foreign currency translation reserve in equity until disposal of the investment, except to extent that the translation difference is allocated to non-controlling interest.

3.3 Cash and cash equivalents

Cash and cash equivalents comprise cash balances, deposits and highly liquid current investments.

3.4 Trade and other receivables

*Policies applicable from January 1, 2020*

Trade and other receivables are stated at their invoice value less allowance for expected credit losses.

The allowance for expected credit losses is disclosed in Note 3.6.

*Policies applicable prior to January 1, 2020*

Trade and other receivables are stated at their invoice value less allowance for doubtful accounts.

The allowance for doubtful accounts is assessed primarily on analysis of overdue aging and future expectations of customer payments. Bad debts are written off when incurred.

### 3.5 Inventories

Inventories are stated at the lower of cost or net realisable value.

Cost is calculated using the weighted average cost principle, and comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. In the case of manufactured inventories and work-in-progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.

Provision is made for obsolete and slow-moving of finished goods, raw materials, factory supplies and spare parts based on the items that are obsoleted and expected to be unsalable.

### 3.6 Financial Instruments

*Policies applicable from January 1, 2020*

The Group shall recognise a financial asset or a financial liability in its statement of financial position only when the Group becomes party to the contractual provisions of the instrument.

*Recognition, Measurement and Classification of financial assets*

Regular way of purchases and sales of financial assets are recognised on trade-date, the date on which the Group commits to purchase or sell the asset. Financial assets are derecognised only when the rights to receive cash flows from the financial assets have expired or when the Group has transferred the financial assets which transferred substantially all the risks and rewards of ownership of the financial assets.

At initial recognition, the Group measures a financial asset as follows:

- A financial asset measured at amortised cost and a financial asset measured at fair value through other comprehensive income are measured at their fair value, plus transaction costs that are directly attributable to the acquisition or issuance of the financial assets.
- A financial asset measured at fair value through profit or loss is measured at its fair value. Transaction costs are expensed in profit or loss.

Subsequent measurement of financial assets depends on the Group's business model for managing the financial asset and the cash flow characteristics of the financial assets. There are three measurement categories into which the Group classifies its financial assets:

- Amortised cost - A financial asset will be measured at amortised cost when the financial asset is held within a business model whose objective is to hold financial assets in order to collect contractual cash flows. In addition, the contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding. Interest income from these financial assets is using the effective interest rate method. Any gain or loss arising on derecognition and reclassification are recognised directly in profit or loss and impairment losses are presented in profit or loss.
- Fair value through other comprehensive income (FVTOCI) - A financial asset will be measured at FVTOCI when it is held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets. In addition, the contractual terms of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding. Movements in the carrying amount are taken through other comprehensive income, except for the recognition of impairment losses and interest income using effective interest rate method. When the financial asset is derecognised, the cumulative gain or loss previously recognised in other comprehensive income is reclassified to profit or loss or retained earnings.
- Fair value through profit or loss (FVTPL) - A financial asset that does not meet the criteria for amortised cost or FVTOCI are measured at FVTPL.

### *Impairment*

The Group assesses on a forward-looking basis the expected credit loss associated with its financial assets carried at amortised cost and investments in debt instruments that are measured at FVTOCI. The Group applies general or simplified approach for credit-impaired consideration which depends on the significant of credit risk.

In determining allowance of expected credit loss, the financial asset is considered to have low credit risk and no significant incremental of credit risk since initial recognition. The Group will not recognize any allowance of expected credit loss.

### *Policies applicable prior to January 1, 2020 for impairment of financial asset and calculation of recoverable amount*

When a decline in the fair value of an available-for-sale financial asset has been recognised directly in equity and there is objective evidence that the value of the asset is impaired, the cumulative loss that had been recognised directly in equity is recognised in profit or loss even though the financial asset has not been derecognised. The amount of the cumulative loss that is recognised in profit or loss is the difference between the acquisition cost and current fair value, less any impairment loss on that financial asset previously recognised in profit or loss.

### *Calculation of recoverable amount*

The recoverable amount of held-to-maturity securities carried at amortised cost is calculated as the present value of the estimated future cash flows discounted at the original effective interest rate.

The recoverable amount of available-for-sale financial assets is calculated by reference to the fair value.

### *Reversals of impairment*

An impairment loss in respect of a financial asset is reversed if the subsequent increase in recoverable amount can be related objectively to an event occurring after the impairment loss was recognised in profit or loss.

### *Derecognition of financial assets*

The Group derecognizes a financial asset only when the contractual rights to the cash flows from the asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity.

On derecognition of a financial asset measured at amortized cost, the difference between the asset's carrying amount and the sum of the consideration received and receivable is recognized in profit or loss. In addition, on derecognition of an investment in a debt instrument classified as at FVTOCI, the cumulative gain or loss previously accumulated in the investments revaluation reserve is reclassified to profit or loss. In contrast, on derecognition of an investment in equity instrument which the Group has elected on initial recognition to measure at FVTOCI, the cumulative gain or loss previously accumulated in the investments revaluation reserve is not reclassified to profit or loss, but is transferred to retained earnings.

### *Recognition, Measurement and Classification of financial liabilities and equities*

Financial instruments issued by the Group must be classified as financial liabilities or equity instruments by considering contractual obligations.

- Where the Group has an unconditional contractual obligation to deliver cash or another financial asset to another entity and is unable to deny or avoid the settlement of the obligation indefinitely, it is considered a financial liability.
- Where the Group has no contractual obligation or has an unconditional right to avoid the settlement of the obligation, it is considered an equity instrument.

At initial recognition, the Group measures financial liabilities, which are not measured at FVTPL, at fair value minus transaction costs that are directly attributable to the acquisition or issuance of the financial assets. The Group classifies all financial liabilities as subsequently measured at amortised cost, except for some financial liabilities.

#### *Derecognition of financial liabilities*

The Group derecognizes financial liabilities when, and only when, the Group's obligations are discharged, cancelled or have expired. The difference between the carrying amount of the financial liability derecognized and the consideration paid and payable is recognized in profit or loss.

When the Group exchanges with the existing lender one debt instrument into another one with the substantially different terms, such exchange is accounted for as an extinguishment of the original financial liability and the recognition of a new financial liability. Similarly, the Group accounts for substantial modification of terms of an existing financial liability or part of it as an extinguishment of the original financial liability and the recognition of a new financial liability. It is assumed that the terms are substantially different if the discounted present value of the cash flows under the new terms, including any fees paid net of any fees received and discounted using the original effective date is at least 10 percent different from the discounted present value of the remaining cash flows of the original financial liability. If the modification is not substantial, the difference between; (1) the carrying amount of the liability before the modification; and (2) the present value of cash flows after modification; is recognized in profit or loss as the modification gain or loss within other gains and losses.

#### *Derivatives*

Derivatives are used to manage exposure to foreign exchange, interest rate arising from operating, financing and investing activities. Derivatives are not used for trading purposes. However, derivatives that do not qualify for hedging instruments are accounted for as trading instruments.

Derivatives are recognised initially at fair value; attributable transaction costs are recognised in profit or loss when incurred. Subsequent to initial recognition, they are remeasured at fair value. The gain or loss on remeasurement is recognised immediately in profit or loss.

The fair value of interest rate swaps is based on broker quotes at the reporting date. Those quotes are tested for reasonableness by discounting estimated future cash flows based on the terms and maturity of each contract and using market interest rates for a similar instrument at the reporting date.

The fair value of forward exchange contracts is based on their listed market price as the reporting date, if available. If the listed market price is not available, then fair value is estimated by forward contract with the same nature and maturity date at the reporting date.

#### *Hedge accounting*

When a derivative is designated as the hedging instrument in a hedge of the variability in cash flows of a non-financial asset or non-financial liability, the effective portion of gain or loss from subsequent measurement of fair value of the derivative is recognised in other comprehensive income and presented in the hedging reserve in equity. Any ineffective portion is recognised immediately in profit or loss.

When a hedge of a non-financial asset or non-financial liability occurs, the gain or loss recognised in other comprehensive income is included in the cost of the non-financial asset or non-financial liability.

#### *Discontinuing hedge accounting*

When the hedging instrument expires or is sold, terminated, or no longer qualifies for hedge accounting, the hedge accounting is discontinued prospectively. Any cumulative gain or loss on the hedging instrument existing in equity is retained in equity. When the hedge of the non-financial assets or non-financial liabilities item ultimately occurs, the gain or loss is adjusted according to cash flow hedges accounting.

When the non-financial assets or non-financial liabilities item is no longer expected to occur, the cumulative gain or loss that was reported in equity is recognised in profit or loss immediately.



### 3.7 Investments in subsidiaries, joint ventures and associates

Investments in subsidiaries, joint ventures and associates in the separate financial statements of the Company are accounted for using the cost method less allowance for impairment. Investments in joint ventures and associates in the consolidated financial statements are accounted for using the equity method.

#### *Disposal of investments*

On disposal of an investment, the difference between net disposal proceeds and the carrying amount is recognised in profit or loss in the statement of income.

If the Group disposes of part of its holding of a particular investment, the deemed cost of the part sold is determined using the weighted average method applied to the carrying value of the total holding of the investment.

### 3.8 Temporary investments and other long-term investments

#### *Policies applicable prior to January 1, 2020*

Debt securities that the Group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are stated at amortised cost, less any impairment losses. The difference between the acquisition cost and redemption value of such debt securities is amortised using the effective interest rate method over the period to maturity.

Debt securities and marketable equity securities, other than those securities held for trading or intended to be held to maturity, are classified as available-for-sale securities. Available-for-sale securities are, subsequent to initial recognition, stated at fair value, and changes therein, other than impairment losses and foreign currency differences on available-for-sale monetary items, are recognised directly in equity. Impairment losses and foreign exchange differences are recognised in profit or loss. When these investments are derecognised, the cumulative gain or loss previously recognised directly in equity is recognised in profit or loss. Where these investments are interest-bearing, interest calculated using the effective interest method is recognised in profit or loss.

Equity securities which are not marketable are stated at cost less any impairment losses.

The fair value of financial instruments classified as available-for-sale is determined as the quoted bid price at the reporting date.

#### *Disposal of investments*

On disposal of an investment, the difference between net disposal proceeds and the carrying amount together with the associated cumulative gain or loss that was reported in equity is recognised in profit or loss.

### 3.9 Investment properties

Property that is held for long-term rental yields or for capital appreciation or both, and that is not occupied by the companies in the consolidated Group, is classified as investment properties.

Investment properties of the Group are land and buildings held for long-term rental yields or for capital appreciation.

Investment properties are measured initially at its cost, including related transaction costs and borrowing costs. Borrowing costs incurred for the purpose of acquiring, constructing or producing a qualifying investment properties are capitalised as part of its cost.

After initial recognition, investment properties are carried at cost less accumulated depreciation and accumulated impairment losses.

Land is not depreciated. Depreciation on other investment properties which are buildings is calculated using the straight line method to allocate their cost to their residual values over their estimated useful life for 27 years.

Subsequent expenditure is capitalised to the asset's carrying amount only when it is probable that future economic benefits associated with the expenditure will flow to the Group and the cost of the item can be measured reliably. All other repairs and maintenance costs is expensed when incurred. When part of an investment property is replaced, the carrying amount of the replaced part is derecognised.

### 3.10 Property, plant and equipment

#### *Recognition and measurement*

##### *Owned assets*

Land are stated at cost less accumulated impairment losses.

Land improvement, plant and equipment are measured at cost less accumulated depreciation and accumulated impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the assets to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located, and capitalised borrowing costs. Cost also may include transfers from other comprehensive income of any gain or loss on qualifying cash flow hedges of foreign currency purchases of property, plant and equipment. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Any gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and are recognised in profit or loss.

##### *Subsequent costs*

The cost of replacing a part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group, and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

##### *Depreciation*

Depreciation on other assets is calculated based on the depreciable amount, which is the cost of an asset, or other amount substituted for cost, less its residual value.

Depreciation is charged to profit or loss on a straight-line basis over the estimated useful lives of each component of an item of assets. The estimated useful lives are as follows:

Land improvement	5-30	years
Plant, machinery, equipment and factory tools	5-40	years
Buildings and buildings improvement	5-30	years
Furniture, fixtures and equipment	3-10	years
Vehicles	5-25	years

No depreciation is provided on land and assets under construction.

Depreciation methods, useful lives and residual values are reviewed at the end of reporting period and adjusted if appropriate.

### 3.11 Leases

*Policies applicable from January 1, 2020*

*The Group as lessee*

The Group assesses whether a contract is or contains a lease, at inception of the contract. The Group recognises a right-of-use asset and corresponding lease liability with respect to all lease arrangements in which it is the lease, except for short-term leases with a lease term of 12 months or less and leases of low value assets, in which the lease payments are recognised as operating expense on a straight-line basis over the lease term and presents as an expense in the statement of income.

The lease liability is initially measured at the present value of the lease payments that are not paid at that date, discounted by using the interest rate implicit in the lease. If this rate cannot be readily determined, the Group uses its incremental borrowing rate.

Lease payments included in the measurement of the lease liability comprise:

- Fixed payments (including in-substance fixed payments), less any lease incentives receivable;
- Variable lease payments that depend on an index or a rate, initially measured using the index or rate as at the commencement date;
- Amount expected to be payable by the lease under residual value guarantees;
- Exercise price of purchase options, if the lease is reasonably certain to exercise the options; and
- Payments of penalties for terminating the lease, if the lease term reflects the lessee exercising an option to terminate the lease.

The lease liability is subsequently measured using the effective interest method and by reducing the carrying amount to reflect the lease payments made. The Group recognises interest from lease liability in the statement of income.

The Group remeasures the lease liability and makes a corresponding adjustment to the related right-of-use asset whenever:

- The lease term has been changed resulting in a change in the assessment of exercise of a purchase option to purchase the underlying asset, in which case the lease liability is remeasured by discounting the revised lease payments using a revised discount rate.
- The lease payments have been changed due to changes in an index or a rate or a change in expected payment under a guaranteed residual value, in which cases the lease liability is remeasured by discounting the revised lease payments using an unchanged discount rate.
- A lease contract is modified and the lease modification that is not accounted for as a separate lease, in which case the lease liability is remeasured based on the lease term of the modified lease by discounting the revised lease payments using a revised discount rate at the effective date of the modification.

The right-of-use assets comprise the initial measurement of the corresponding lease liability, including lease payments made at or before the commencement day, any initial direct costs, less any lease incentives received. They are subsequently measured at cost less accumulated depreciation and accumulated impairment losses.

Right-of-use assets are depreciated over the shorter period of lease term and useful life of the underlying asset. If a lease transfers ownership of the underlying asset and the Group expects to exercise a purchase option, the related right-of-use is depreciated over the useful life of the underlying asset. The depreciation starts at the commencement date of the lease. In addition, the right-of-use assets are assessed for impairment in accordance with TAS 36 "Impairment of assets".

*The Group as lessor*

Leases for which the Group is a lessor are classified as operating leases.

Rental income from operating leases is recognised on a straight line basis over the term of the relevant lease. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognised on a straight line basis over the lease term.

*Policies applicable prior to January 1, 2020*

*Leased assets*

Leases in terms of which the Group substantially assumes all the risk and rewards of ownership are classified as finance leases. Property, plant and equipment acquired by way of finance leases are capitalised at the lower of their fair value and the present value of the minimum lease payments at the inception of the lease, less accumulated depreciation and impairment losses. Lease payments are apportioned between the finance charges and reduction of the lease liability so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are charged directly to the profit or loss.

*Operating leases*

Payments made under operating leases are recognised in profit or loss on a straight line basis over the term of the lease.

Contingent lease payments which the lease adjustment is confirmed are accounted for by revising the minimum lease payments over the remaining term of the lease.

3.12 Intangible assets

*Goodwill*

Goodwill that arises upon the acquisition of businesses is included in intangible assets. Subsequent to initial recognition, goodwill is measured at cost less accumulated impairment losses.

Goodwill in investment in joint ventures and associates is included in the carrying amount of the investment in joint ventures and associates, impairment loss on such an investment is deducted directly in investment in joint ventures and associates.

*Other intangible assets*

Other intangible assets that are acquired by the Group and have finite useful lives are measured at cost less accumulated amortisation and accumulated impairment losses.

*Subsequent expenditure*

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, are recognised in profit or loss as incurred.

*Amortisation*

Amortisation is based on the cost of the asset less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets, other than goodwill and trademark, from the date that they are available for use, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. The estimated useful lives are as follows:

Production licence fees	10-30	years
Computer software	3-10	years
Right to use - others	3-15	years

Amortisation methods, useful lives and residual values are reviewed at the end of reporting period and adjusted if appropriate.

### 3.13 Impairment

The carrying amounts of the Group's assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, the assets' recoverable amounts are estimated. For goodwill and intangible assets that have indefinite useful lives or are not yet available for use, the recoverable amount is estimated each year at the same time.

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. The impairment loss is recognised in profit or loss.

#### *Calculation of recoverable amount*

The recoverable amount of a non-financial asset is the greater of the asset's value in use and fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For an asset that does not generate cash inflows largely independent of those from other assets, the recoverable amount is determined for the cash-generating unit to which the asset belongs.

#### *Reversals of impairment*

An impairment loss in respect of goodwill is not reversed.

Impairment losses recognised in prior periods in respect of other non-financial assets are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

### 3.14 Employee benefits

#### *Defined contribution plans*

Obligations for contributions to defined contribution plans are expensed as the related service is provided. The defined contribution plans comprise provident funds established by the Group for its employees. Membership to the funds is on a voluntary basis. Contributions are made monthly by the employees at the minimum rate as required by law not exceeding 15% of their basic salaries and the Group contributes at the minimum rate as required by law not exceeding 15% of the employees' basic salaries. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by a licensed Fund Manager.

#### *Defined benefit plans*

The Group's net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods, discounting that amount.

The calculation of defined benefit obligations is performed every 3 years by a qualified actuary using the projected unit credit method.

Remeasurements of the defined benefit liability, actuarial gain or loss are recognised immediately in Other comprehensive income. The Group determines the interest expense on the defined benefit liability for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period. Interest expense and other expenses related to defined benefit plans are recognised in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognised immediately in profit or loss. The Group recognises gains and losses on the settlement of a defined benefit plan when the settlement occurs.

#### *Other long-term employee benefits*

The Group's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognised in profit or loss in the period in which they arise.

#### *Termination benefits*

Termination benefits are expensed at the earlier of when the Group can no longer withdraw the offer of those benefits and when the Group recognises costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.

#### *Short-term employee benefits*

Short-term employee benefits are expensed as the related service is provided. A liability is recognised for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

### 3.15 Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount on provisions is recognised as finance cost.

### 3.16 Repurchase of share capital (treasury stock)

When share capital recognised as equity is repurchased, the amount of consideration paid, including directly attributable costs, is classified as treasury stock and recognised as a deduction from equity. An equal amount is appropriated from retained earnings and taken to a reserve for treasury stock within equity. When treasury stock are sold, the amount received is recognised as an increase in equity by crediting the cost of the treasury stock sold, calculated using the weighted average method, to the treasury stock account and transferring the equivalent amount back from treasury stock reserve to retained earnings. Surpluses on the sale of treasury stock are taken directly to a separate category within equity, 'Premium on treasury stock'. Net deficits on sale or cancellation of treasury stock are debited to retained earnings after setting off against any remaining balance of premium on treasury stock.

### 3.17 Revenue

Revenue excludes value added taxes and is arrived at after deduction of trade discounts.

#### *Revenues from sale of goods and rendering of services*

Revenues from sale of goods is recognised when control of the goods has transferred to the customer, being at the point the goods are delivered to the customer. Revenues from rendering of services is recognised as a performance obligation satisfied at a point in time when services underlying the particular performance obligation is transferred to the customer or is recognised over time based on the stage of completion of the contract.

#### *Investment income*

Investment income consists of dividend income, interest income from investments and bank deposits, and net gain or loss arises from financial assets or financial liability measured at FVTPL. Dividend income is recognised in profit or loss on the date the Group's right to receive payments is established. Interest income is recognised on a time basis, based on the principle outstanding and the applicable interest rate.

#### *Other income*

Other income is recognised on an accrual basis.

### 3.18 Finance costs

Finance costs is recognised using the effective interest method and comprise interest expense on borrowings, unwinding of the discount on provisions and contingent consideration.

Borrowing costs that are not directly attributable to the acquisition, construction or production of a qualifying asset are recognised in profit or loss using the effective interest method

### 3.19 Income tax

Income tax expense for the year comprises current and deferred tax. Current and deferred tax are recognised in profit or loss except to the extent that they are relate to the items recognised in equity are recognised in other comprehensive income.

Current tax is the expected tax payable or receivable on the taxable income for the year, using tax rates enacted at the end of the reporting period, and any adjustment to tax payable or receivable in respect of previous years.

Deferred tax is recognised in respect of temporary differences between the carrying amounts and taxable value of assets and liabilities, using tax rates enacted or substantively enacted to the temporary differences when they reverse.

Deferred tax is not recognised for the following temporary differences:

- the initial recognition of goodwill and related transactions
- the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss
- differences relating to investments in subsidiaries to the extent that it is probable that they will not reverse in the foreseeable future.

The measurement of deferred tax reflects the tax consequences that would follow the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

In determining the amount of current and deferred tax, the Group takes into account the impact of uncertain tax positions and whether additional taxes and interest may be due. The Group believes that its accruals for tax liabilities are adequate for all open tax years based on its assessment of many factors, including interpretations of tax law and prior experience. This assessment relies on estimates and assumptions and may involve a series of judgements about future events. New information may become available that causes the Group to change its judgement regarding the adequacy of existing tax liabilities; such changes to tax liabilities will impact tax expense in the period that such a determination is made.

Deferred tax assets and liabilities on different tax entities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority.

A deferred tax asset is recognised to the extent that it is probable that deferred tax assets can be utilised as future tax benefit. Deferred tax assets are reviewed at each reporting date and reduced to the extent that it is no longer probable that the related tax benefit will be realised.

### 3.20 Basic earnings (loss) per share

Basic earnings (loss) per share (“EPS”) is calculated by dividing profit (loss) for the year attributable to owners of the parent by the weighted average number of ordinary shares outstanding during the year, adjusted for treasury shares.

### 3.21 Financial information by segment

Segment results that are reported to the Group’s Management Committee (the chief operating decision maker) include items directly attributable to a segment as well as those that can be allocated on a reasonable basis.

### 3.22 Measurement of fair values

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial assets and liabilities.

When measuring the fair value of an asset or a liability, the Group uses observable market data as far as possible. Fair values are categorised into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at the measurement date.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or liability might be categorised in different levels of the fair value hierarchy, then the fair value measurement is categorised in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

### 3.23 Use of management's judgments

The preparation of financial statements in conformity with TFRS requires the Group's management to exercise judgments in order to determine the accounting policies, estimates and various assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the end of the reporting period and the reported amounts of revenues and expenses during the reporting period. Although these estimates are based on management's reasonable consideration of current events, actual results may differ from these estimates. The significant uses of management's judgements are as follows:

#### 3.23.1 *Fair value measurements and valuation processes*

Some of the Group's assets and liabilities are measured at fair value for financial reporting purposes.

In estimating the fair value of an asset or liability, the Group uses market-observable data to the extent it is available. Where Level 1 inputs are not available, the Group uses other observable information either directly or indirectly or other unobservable information according to level of fair value respectively.

Information about valuation techniques and inputs used in determining the fair value of various assets and liabilities are disclosed in Note 35.

#### 3.23.2 *Calculation of recoverable amount*

In the calculation of recoverable amount, the Group's management estimated the future cash flows discounted to their present value using an appropriate discount rate that reflects current market assessments of the time value of money and the risks specific to the asset.

#### 3.23.3 *Impairment of goodwill*

Determining whether goodwill is impaired requires an estimation of the value in use of the cash-generating units to which goodwill has been allocated. The value in use calculation requires the Group's management to estimate the future cash flows expected to arise from the cash-generating unit and a suitable discount rate in order to calculate present value where the actual future cash flows are less than expected, an impairment loss may arise.

#### 3.23.4 *Recognition of deferred tax assets*

The recognition of deferred tax assets is based upon whether it is probably that sufficient taxable profits will be available in the future against which the reversal of temporary differences can be deducted which involves judgement regarding the future financial performance of the Group.



#### 4. ACQUISITION OF BUSINESSES

On August 8, 2018, the Group entered into the Shares Purchase Agreement to acquire 74% share of Siam Mitsui PTA Company Limited, Purified Terephthalic Acid producer, and 74% share of Thai PET Resin Company Limited, Polyethylene Terephthalate resin producer, directly and indirectly, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. Subsequently on December 27, 2018, the Group completed the share acquisition of subsidiaries for a preliminary cash consideration of approximately Baht 4,123 million. The final purchase price was settled with the seller for an additional payment of approximately Baht 1,249 million, which already paid in March 2019.

Management believes that the acquisition is harmonised with the business strategy of the Company that intends to expand the downstream investment and increase market potential in polymer business to satisfy customer's need.

The purchase under this condition is in accordance with TFRS 3 Business Combinations, requires the recognition of assets, liabilities and contingent liabilities acquired at the acquisition date at fair value. The Group is in process of hiring an independent appraiser to determine the fair value of assets and liabilities acquired during the measurement period, which must not exceed one year from the acquisition date to reflect new information obtained about facts and circumstances that existed as of the acquisition date. Accordingly, the fair value of assets acquired and liabilities assumed have been provisionally determined at the acquisition date (the value of property, plant and equipment determined by independent assets appraiser).

However, the fair value of assets acquired and liabilities have been already completed. Therefore, the fair value of assets acquired and liabilities have been adjusted and a gain on bargain purchase of Baht 31 million has been recognised in the consolidated income statement for the year ended December 31, 2019.

The following summarises the major classes of consideration transferred, and the recognised amounts of assets acquired and liabilities assumed at the acquisition date:

Identifiable assets acquired and liabilities assumed as at December 31, 2018:

	<b>Fair values (in million Baht)</b>
Cash and cash equivalents	1,589
Trade receivables	2,481
Inventories	2,201
Property, plant and equipment	9,549
Intangible assets	8
Trade payables	(2,777)
Other payables	(183)
Long-term borrowings from financial institutions	(750)
Deferred tax	(584)
Other assets/(liabilities), net	(2,444)
<b>Net identifiable assets acquired and liabilities assumed</b>	<b>9,090</b>
Non-controlling interest acquired	(2,363)
<b>Net assets acquired and liabilities assumed</b>	<b>6,727</b>
Gain on bargain purchase	(1,355)
<b>Total consideration</b>	<b>5,372</b>
Cash acquired	(1,589)
<b>Net consideration</b>	<b>3,783</b>

#### *Acquisition-related costs*

The Group incurred acquisition-related costs of Baht 110 million related to external legal fees and due diligence costs. The legal fees and due diligence costs have been included in administrative expenses in the Group's consolidated statement of income in the period which transaction occurred.

**5. CASH AND CASH EQUIVALENTS**

5.1 Cash and cash equivalents as at December 31, 2020 and 2019 consist of:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Cash on hand	2	2	2	2
Cash and highly liquid current investments (Private funds)	-	62	-	62
Cash at banks - current accounts	2,307	822	100	5
Cash at banks - savings accounts	30,262	13,091	20,633	9,283
Cash at banks - foreign accounts	2,484	2,321	1,838	1,546
Highly liquid current investments	-	2,542	-	1,499
Financial assets at amortisation costs				
- Deposit at bank	9,257	-	8,961	-
Financial assets at fair value through other comprehensive income				
- Treasury bills	1	-	1	-
<b>Total</b>	<b><u>44,313</u></b>	<b><u>18,840</u></b>	<b><u>31,535</u></b>	<b><u>12,397</u></b>

As at December 31, 2020 and 2019, bank accounts of two subsidiaries totalling Baht 726 million and Baht 60 million, respectively, are pledged as collateral to secure credit facilities obtained from financial institutions. However, the pledged bank accounts can be withdrawn in accordance with the objective and conditions stipulated in the loan agreements for use as working capital required in the normal course of business (see Note 20.2).

5.2 Non-cash transactions:

Reconciliation of liabilities arising from financing activities

The table below details changes in the liabilities arising from financing activities, including both cash and non-cash changes.

As at December 31, 2020

Unit : Million Baht

	Consolidated financial statements									
	Balance as at January 1, 2020	Net financing cash flows	Non-cash changes						Others	Balance as at December 31, 2020
Interest expense			Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in lease liabilities	Amortisation of deferred interest from lease	(Gain) Loss on exchange rate			
Accrued interest expense	846	(3,365)	4,118	(867)	220	-	-	-	-	952
Lease liabilities	401	(982)	-	-	-	7,220	170	17	(39)	6,787
Short-term borrowings from financial institutions	2,021	(2,026)	-	-	-	-	-	24	-	19
Long-term borrowings from financial institutions	34,626	27,966	-	-	(152)	-	-	511	-	62,951
Long-term borrowings from other parties	310	(43)	-	-	-	-	-	27	-	294
Debentures	70,131	15,000	-	-	22	-	-	(121)	-	85,032
<b>Total</b>	<b>108,335</b>	<b>36,550</b>	<b>4,118</b>	<b>(867)</b>	<b>90</b>	<b>7,220</b>	<b>170</b>	<b>458</b>	<b>(39)</b>	<b>156,035</b>

As at December 31, 2019

Unit : Million Baht

	Consolidated financial statements									
	Balance as at January 1, 2019	Net financing cash flows	Non-cash changes						Others	Balance as at December 31, 2019
Interest expense			Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in lease liabilities	Amortisation of deferred interest from lease	Gain on exchange rate			
Accrued interest expense	706	(2,918)	3,637	(658)	93	-	-	(14)	-	846
Lease liabilities	320	(176)	-	-	-	250	7	-	-	401
Short-term borrowings from financial institutions	3,343	(1,281)	-	-	-	-	-	(41)	-	2,021
Long-term borrowings from financial institutions	37,962	(2,847)	-	-	39	-	-	(552)	24	34,626
Long-term borrowings from other parties	1,252	(27)	-	-	3	-	-	(71)	(847)	310
Debentures	54,350	18,058	-	-	47	-	-	(2,324)	-	70,131
<b>Total</b>	<b>97,933</b>	<b>10,809</b>	<b>3,637</b>	<b>(658)</b>	<b>182</b>	<b>250</b>	<b>7</b>	<b>(3,002)</b>	<b>(823)</b>	<b>108,335</b>

As at December 31, 2020

Unit : Million Baht

	Separate financial statements								
	Balance as at January 1, 2020	Net financing cash flows	Non-cash changes					(Gain) Loss on exchange rate	Balance as at December 31, 2020
			Interest expense	Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in lease liabilities	Amortisation of deferred interest from lease		
Accrued interest expense	863	(3,141)	3,456	(407)	199	-	-	-	970
Lease liabilities	289	(1,057)	-	-	-	6,672	160	-	6,064
Short-term borrowings from related parties	3,041	2,567	-	-	-	-	-	-	5,608
Long-term borrowings from financial institutions	10,073	22,889	-	-	(156)	-	-	25	32,831
Long-term borrowing from a related party	14,991	-	-	-	18	-	-	(61)	14,948
Debentures	55,221	15,000	-	-	6	-	-	(63)	70,164
<b>Total</b>	<b>84,478</b>	<b>36,258</b>	<b>3,456</b>	<b>(407)</b>	<b>67</b>	<b>6,672</b>	<b>160</b>	<b>(99)</b>	<b>130,585</b>

As at December 31, 2019

Unit : Million Baht

	Separate financial statements								
	Balance as at January 1, 2019	Net financing cash flows	Non-cash changes					Gain on exchange rate	Balance as at December 31, 2019
			Interest expense	Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in lease liabilities	Amortisation of deferred interest from lease		
Accrued interest expense	715	(2,449)	2,851	(280)	26	-	-	-	863
Lease liabilities	226	(122)	-	-	-	180	5	-	289
Short-term borrowings from related parties	1,931	1,110	-	-	-	-	-	-	3,041
Long-term borrowings from financial institutions	14,419	(4,280)	-	-	5	-	-	(71)	10,073
Long-term borrowing from a related party	16,105	-	-	-	18	-	-	(1,132)	14,991
Debentures	38,321	18,058	-	-	(7)	-	-	(1,151)	55,221
<b>Total</b>	<b>71,717</b>	<b>12,317</b>	<b>2,851</b>	<b>(280)</b>	<b>42</b>	<b>180</b>	<b>5</b>	<b>(2,354)</b>	<b>84,478</b>

## 6. TRADE RECEIVABLES

Trade receivables as at December 31, 2020 and 2019 consist of:

	<i>Note</i>	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
		<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Related parties	28	11,150	16,721	17,794	22,433
Other parties		18,186	17,485	4,817	5,705
<b>Total</b>		<b>29,336</b>	<b>34,206</b>	<b>22,611</b>	<b>28,138</b>
<u>Less</u> Allowance for credit loss		(59)	-	(19)	-
Allowance for doubtful accounts		-	(49)	-	(19)
<b>Total trade receivables</b>		<b>29,277</b>	<b>34,157</b>	<b>22,592</b>	<b>28,119</b>

The following table shows the details of trade receivables as at December 31, 2020 and 2019, classified by aging and expected credit losses ("ECL"):

As at December 31, 2020	Not due	<u>Consolidated financial statements</u> Trade receivables				Total
		Past due				
		Less than 3 months	Over 3 months but less than 6 months	Over 6 months but less than 12 months	Over 12 months	
Expected credit loss rate	0.00%	0.12%	30.32%	73.90%	90.82%	
Expected total gross carrying amount at default						
- Related parties	11,128	22	-	-	-	11,150
- Other parties	17,625	483	21	3	54	18,186
Lifetime ECL	-	(1)	(7)	(2)	(49)	(59)
<b>Total trade receivables</b>	<b>28,753</b>	<b>504</b>	<b>14</b>	<b>1</b>	<b>5</b>	<b>29,277</b>

As at December 31, 2019	Not due	<u>Consolidated financial statements</u> Trade receivables				Total
		Past due				
		Less than 3 months	Over 3 months but less than 6 months	Over 6 months but less than 12 months	Over 12 months	
Trade receivables						
- Related parties	16,705	16	-	-	-	16,721
- Other parties	16,980	453	8	6	38	17,485
Allowance for doubtful accounts	-	(2)	(6)	(3)	(38)	(49)
<b>Total trade receivables</b>	<b>33,685</b>	<b>467</b>	<b>2</b>	<b>3</b>	<b>-</b>	<b>34,157</b>

Unit : Million Baht

As at December 31, 2020	Not due	<u>Separate financial statements</u>				Total
		Trade receivables				
		Past due				
		Less than 3 months	Over 3 months but less than 6 months	Over 6 months but less than 12 months	Over 12 months	
Expected credit loss rate	0.00%	0.00%	0.00%	0.00%	100.00%	
Expected total gross carrying amount at default						
- Related parties	17,793	1	-	-	-	17,794
- Other parties	4,789	9	-	-	19	4,817
Lifetime ECL	-	-	-	-	(19)	(19)
<b>Total trade receivables</b>	<b>22,582</b>	<b>10</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>22,592</b>

Unit : Million Baht

As at December 31, 2019	Not due	<u>Separate financial statements</u>				Total
		Trade receivables				
		Past due				
		Less than 3 months	Over 3 months but less than 6 months	Over 6 months but less than 12 months	Over 12 months	
Trade receivables						
- Related parties	22,428	5	-	-	-	22,433
- Other parties	5,684	2	-	-	19	5,705
Allowance for doubtful accounts	-	-	-	-	(19)	(19)
<b>Total trade receivables</b>	<b>28,112</b>	<b>7</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>28,119</b>

The normal credit term granted by the Group ranges from 14 days to 90 days.

The following table shows the movement in lifetime ECL that has been recognised for trade receivables in accordance with the simplified approach set out in TFRS 9 for the year ended December 31, 2020.

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>	<u>financial statements</u>	<u>Separate</u>	<u>financial statements</u>
<b>Balance as at January 1, 2020</b>		49		19
Net remeasurement of loss allowance		33		-
Amounts recovered		(25)		-
Foreign exchange gains and translation differences		2		-
<b>Balance as at December 31, 2020</b>		<b>59</b>		<b>19</b>

## 7. OTHER RECEIVABLES

Other receivables as at December 31, 2020 and 2019 consist of:

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>	<u>financial statements</u>	<u>financial statements</u>	<u>financial statements</u>
	2020	2019	2020	2019
Prepaid expenses	1,733	1,358	917	747
Receivable from oil hedging contracts	34	417	34	417
Accrued income	619	216	500	305
Other receivables	943	579	458	578
Receivable from The Revenue Department	210	367	69	222
Others	187	212	35	46
<b>Total</b>	<b>3,726</b>	<b>3,149</b>	<b>2,013</b>	<b>2,315</b>

## 8. INVENTORIES

Inventories as at December 31, 2020 and 2019 consist of:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Finished goods	11,604	14,078	7,620	9,405
Work in progress	1,446	1,618	855	992
Raw materials	5,868	9,387	4,544	8,095
Factory supplies and spare parts	11,749	10,406	8,596	8,113
Goods in transit	2,960	1,221	1,014	49
<b>Total</b>	<b>33,627</b>	<b>36,710</b>	<b>22,629</b>	<b>26,654</b>
Less Allowance for decline in value	(28)	(303)	(3)	(240)
Allowance for obsolescence	(154)	(155)	(38)	(33)
<b>Net</b>	<b>33,445</b>	<b>36,252</b>	<b>22,588</b>	<b>26,381</b>

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Inventories recognised as an expense in cost of sales of goods				
- Cost of sales	315,658	389,752	268,282	339,857
- Reversal of write-down to net realisable value of inventories	(275)	(1,061)	(237)	(1,090)
<b>Net</b>	<b>315,383</b>	<b>388,691</b>	<b>268,045</b>	<b>338,767</b>

As at December 31, 2020 and 2019, the Company's inventories included petroleum legal reserve of 227 million liters with approximated value of Baht 2,204 million and 302 million liters with approximated value of Baht 4,072 million, respectively.

## 9. INVESTMENTS IN SUBSIDIARIES

Movements of investments in subsidiaries for the years ended December 31, were as follows:

	<u>Unit : Million Baht</u>	
	<u>Separate</u>	
	<u>2020</u>	<u>2019</u>
<b>Subsidiaries</b>		
As at January 1,	72,551	67,783
Acquisition	3,935	4,833
Capital distribution	-	(2)
Allowance for impairment	-	(63)
<b>As at December 31,</b>	<b>76,486</b>	<b>72,551</b>

Investments in subsidiaries as at December 31, 2020 and 2019, and dividend income for the years ended December 31, 2020 and 2019 were as follows:

	<u>Separate financial statements</u>												Unit : Million Baht	
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Impairment</u>		<u>At cost-net</u>		<u>Fair value of listed securities</u>		<u>Dividend income</u>	
	<u>Interest (%)</u>		<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Subsidiaries</i>														
Global Green Chemicals Plc.	72	72	10,237	10,237	7,400	7,400	-	-	7,400	7,400	6,956	9,324	148	111
GC Glycol Co., Ltd.	100	100	5,395	5,395	5,395	5,395	-	-	5,395	5,395	-	-	-	432
GC Polyols Co., Ltd.	82	82	3,693	2,692	3,032	2,210	-	-	3,032	2,210	-	-	-	-
GC Marketing Solutions Co., Ltd.	99	99	40	40	451	451	-	-	451	451	-	-	422	40
GC Maintenance and Engineering Co., Ltd.	100	100	137	137	155	155	-	-	155	155	-	-	6	128
GC Logistics Solutions Co., Ltd.	99	99	1,200	1,200	1,607	1,607	-	-	1,607	1,607	-	-	30	30
GC Ventures Co., Ltd.	100	100	567	465	567	465	-	-	567	465	-	-	-	-
GC Treasury Center Co., Ltd.	100	100	10	10	10	10	-	-	10	10	-	-	29	-
GC Styrenics Co., Ltd.	100	100	190	190	190	190	-	-	190	190	-	-	-	-
GC Oxirane Co., Ltd.	100	100	7,136	5,267	7,136	5,267	-	-	7,136	5,267	-	-	-	-
GC-M PTA Company Limited	49	49	4,800	4,800	2,903	2,903	-	-	2,903	2,903	-	-	-	-
GC Estate Co., Ltd.	100	100	7,200	7,200	7,200	7,200	-	-	7,200	7,200	-	-	-	-
Solution Creation Co., Ltd.	100	100	826	524	826	524	-	-	826	524	-	-	-	-
Thai Tank Terminal Limited	51	51	900	900	459	459	-	-	459	459	-	-	500	535
PTT Phenol Co., Ltd.	100	100	11,851	11,851	13,155	13,155	-	-	13,155	13,155	-	-	460	1,390
NPC Safety and Environmental Service Co., Ltd.	100	100	165	165	165	165	-	-	165	165	-	-	11	-
ENVICCO Limited	70	-	270	-	189	-	-	-	189	-	-	-	-	-
PTTGC America Corporation	100	100	-	-	5,058	4,407	-	-	5,058	4,407	-	-	-	-
PTTGC International Private Limited	100	100	30,877	30,877	30,877	30,877	(10,289)	(10,289)	20,588	20,588	-	-	-	-
<b>Total investments in subsidiaries</b>					<b>86,775</b>	<b>82,840</b>	<b>(10,289)</b>	<b>(10,289)</b>	<b>76,486</b>	<b>72,551</b>	<b>6,956</b>	<b>9,324</b>	<b>1,606</b>	<b>2,666</b>



### ***Change in investments in subsidiaries***

#### *GC Polyols Co., Ltd.*

During the year ended December 31, 2020, GC Polyols Co., Ltd. (“GCP”) has called for paid-up capital from the capital increase by the Board of Directors’ Meeting of GCP held on November 11, 2019 for conducting a Polyols & PU System Project at Baht 294.23 million, of which fully received in January 2020 and March 2020. Subsequently on April 8, 2020, GCP registered for capital increase by the Annual General Meeting for the year 2020 of shareholders of GCP totalling 9,520,000 shares at Baht 100 per share amounting to Baht 952 million, in which the GCP’s registered capital increased from the original registered capital amounting to Baht 3,050 million to a new registered capital amounting to Baht 4,002 million, and called for paid-up capital from the capital increase totalling at Baht 642.60 million from the shareholders, of which fully received amounting to Baht 527.57 million from the Company during the year ended December 31, 2020.

During the year ended December 31, 2019, GC Polyols Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors’ Meeting of the subsidiary held on November 14, 2018 for conducting a Polyols & PU System Project at Baht 1,158.12 million, of which fully received during the year ended December 31, 2019.

#### *GC Ventures Co., Ltd.*

On August 3, 2020, GC Ventures Co., Ltd. has called for paid-up capital from the capital increase by the Annual General Meeting for the year 2020 of shareholders of the subsidiary held on March 19, 2020 for investment in Corporate Venture Capital (CVC) at Baht 102.13 million, of which fully received in August 2020.

During the year ended December 31, 2019, GC Ventures Co., Ltd. has called for paid-up capital from the capital increase by the Annual General Meeting of shareholders of the subsidiary held on March 25, 2019, for investment in Corporate Venture Capital (CVC) at Baht 320.76 million, of which fully received during the year ended December 31, 2019.

#### *GC Oxirane Co., Ltd.*

On January 3, 2020, GC Oxirane Co., Ltd. (“GCO”) has called for paid-up capital from the capital increase by the Board of Directors’ Meeting of GCO held on October 5, 2017 for conducting a Propylene Oxide Project at Baht 262.68 million, of which fully received in January 2020. In addition, GCO registered for capital increase by the Extraordinary General Meeting of shareholders of GCO held on December 9, 2019 totalling 22,310,000 shares at Baht 100 per share amounting to Baht 2,231 million, in which the GCO’s registered capital increased from the original registered capital amounting to Baht 5,530 million to a new registered capital amounting to Baht 7,761 million. During the year ended December 31, 2020, GCO has called for paid-up capital from the capital increase by the Board of Directors’ Meeting of GCO held on January 15, 2020 totalling at Baht 1,606.32 million, of which fully received during the year ended December 31, 2020.

During the year ended December 31, 2019, GC Oxirane Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors’ Meeting of the subsidiary held on October 5, 2017 for conducting a Propylene Oxide Project at Baht 2,875.60 million, of which fully received during the year ended December 31, 2019.

#### *Solution Creation Co., Ltd.*

On July 22, 2020, Solution Creation Co., Ltd. has called for paid-up capital from the capital increase by the Extraordinary General Meeting of shareholders of the subsidiary held on May 7, 2020 to invest in Dynachisso Thai Co., Ltd. at Baht 302.12 million, of which fully received in July 2020.

On March 14, 2019, Solution Creation Co., Ltd. has called for paid-up capital from the capital increase from the Company following the Extraordinary General Meeting of shareholders of the subsidiary held on January 11, 2019 to invest in Revolve Group Limited at Baht 340.90 million, of which received in March 2019.

*ENVICCO Limited*

On July 22, 2019, the Board of Directors' Meeting of the Company approved to establish ENVICCO Limited ("ENVICCO") as a subsidiary in which share capital held by the Company as 70% and ALPHA TH Recyclingbeteiligungsgesellschaft m.b.H. as 30%. The purpose of ENVICCO is for conducting a Recycled Plastic Project. On February 3, 2020, ENVICCO registered the establishment with registered capital of 1,000 shares at Baht 100 per share amounting to Baht 0.10 million and called for paid-up capital of 1,000 shares at Baht 25 per share, totalling Baht 25,000 from the Company. Subsequently on February 20, 2020, ENVICCO registered for capital increase totalling 10,799,000 shares at Baht 100 per share amounting to Baht 1,079.90 million, in which the ENVICCO's registered capital increased from the original registered capital amounting to Baht 0.10 million to a new registered capital amounting to Baht 1,080 million, and called for paid-up capital of 25% of registered capital amounting to Baht 270 million from the shareholders, of which fully received amounting to Baht 189 million from the Company in March 2020.

*PTTGC America Corporation*

During the year ended December 31, 2020, PTTGC America Corporation has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the subsidiary held on July 15, 2016 and September 15, 2020 for the purpose of US Petrochemical Complex Project investment totalling at USD 20.84 million or equivalent to Baht 651.18 million, of which fully received during the year ended December 31, 2020.

On August 28, 2019, PTTGC America Corporation has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the subsidiary held on July 15, 2016 for the purpose of US Petrochemical Complex Project investment at USD 1.50 million or equivalent to Baht 46.24 million, of which fully received in September 2019.

*PTTGC International Private Limited*

On May 8, 2019, PTTGC International Private Limited has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the subsidiary held on April 29, 2019 for the purpose of corporate and its subsidiary operation at SGD 3.92 million or equivalent to Baht 91.89 million, of which fully received in May 2019.

**Impairment loss on investment in a subsidiary**

*PTTGC International Private Limited*

During the year ended December 31, 2019, the Company recognised impairment loss on the investment in PTTGC International Private Limited totalling Baht 63.05 million in the separate financial statements as the recoverable amount of investment in PTTGC Innovation America Corp. was less than its carrying amount.

**10. INVESTMENTS IN JOINT VENTURES**

Movements of investments in joint ventures for the years ended December 31, were as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Joint ventures</b>				
As at January 1,	32,444	30,758	15,373	15,373
Acquisitions	522	794	-	-
Share of profit of investments in joint ventures	863	2,626	-	-
Share of other comprehensive income (loss) of joint ventures	279	(532)	-	-
Dividend income	(1,600)	(1,367)	-	-
Effect from translation differences on foreign investment	33	165	-	-
Effect from first-time adoption of new accounting policy (see Note 2.6)	(4)	-	-	-
<b>As at December 31,</b>	<b>32,537</b>	<b>32,444</b>	<b>15,373</b>	<b>15,373</b>

Investments in joint ventures as at December 31, 2020 and 2019, and dividend income for the years ended December 31, 2020 and 2019 were as follows:

Unit : Million Baht

<u>Consolidated financial statements</u>														
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Equity method</u>		<u>Impairment</u>		<u>Equity method - net</u>		<u>Dividend income</u>	
	<u>Interest (%)</u>		<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
	<u>2020</u>	<u>2019</u>												
<i>Direct joint ventures</i>														
PTT Asahi Chemical Co., Ltd.	50	50	13,819	13,819	996	996	10,449	10,878	-	-	10,449	10,878	-	-
PTT MCC Biochem Co., Ltd.	50	50	1,860	1,860	160	160	160	168	-	-	160	168	-	-
HMC Polymers Co., Ltd.	41	41	3,790	3,790	14,217	14,217	12,624	12,337	-	-	12,624	12,337	289	828
					<u>15,373</u>	<u>15,373</u>	<u>23,233</u>	<u>23,383</u>	<u>-</u>	<u>-</u>	<u>23,233</u>	<u>23,383</u>	<u>289</u>	<u>828</u>
<i>Indirect joint ventures</i>														
Thai Ethoxylate Co., Ltd.	50	50	420	420	210	210	602	585	-	-	602	585	66	223
Emery Oleochemicals (M) Sdn. Bhd.	50	50	4,530	4,530	4,966	4,966	4,398	4,495	-	-	4,398	4,495	-	-
Emery Specialty Chemicals Sdn. Bhd.	50	50	818	818	407	407	-	-	-	-	-	-	-	-
Nature Works LLC	50	50	43,167	43,167	4,793	4,793	3,033	3,274	-	-	3,033	3,274	1,245	316
GGC KTIS Bioindustrial Company Limited	50	50	2,093	1,048	1,046	524	1,021	512	-	-	1,021	512	-	-
Revolve Group Limited	49	49	3	3	270	270	250	195	-	-	250	195	-	-
					<u>11,692</u>	<u>11,170</u>	<u>9,304</u>	<u>9,061</u>	<u>-</u>	<u>-</u>	<u>9,304</u>	<u>9,061</u>	<u>1,311</u>	<u>539</u>
<b>Total investments in joint ventures</b>					<u><b>27,065</b></u>	<u><b>26,543</b></u>	<u><b>32,537</b></u>	<u><b>32,444</b></u>	<u><b>-</b></u>	<u><b>-</b></u>	<u><b>32,537</b></u>	<u><b>32,444</b></u>	<u><b>1,600</b></u>	<u><b>1,367</b></u>

Unit : Million Baht

<u>Separate financial statements</u>												
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Impairment</u>		<u>At cost - net</u>		<u>Dividend income</u>	
	<u>Interest (%)</u>											
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Joint ventures</i>												
PTT Asahi Chemical Co., Ltd.	50	50	13,819	13,819	996	996	-	-	996	996	-	-
PTT MCC Biochem Co., Ltd.	50	50	1,860	1,860	160	160	-	-	160	160	-	-
HMC Polymers Co., Ltd.	41	41	3,790	3,790	14,217	14,217	-	-	14,217	14,217	289	828
<b>Total investments in joint ventures</b>					<b>15,373</b>	<b>15,373</b>	<b>-</b>	<b>-</b>	<b>15,373</b>	<b>15,373</b>	<b>289</b>	<b>828</b>

*Joint ventures*

The following table summarises the financial information of the joint ventures as included in their own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarised financial information to the carrying amount of the Group's interest in these companies.

	Unit : Million Baht			
	<u>PTT Asahi Chemical Co., Ltd.</u>		<u>HMC Polymers Co., Ltd.</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>For the years ended December 31,</b>				
<b>Statement of profit or loss</b>				
Revenue	8,293	13,141	25,128	27,033
Depreciation and amortisation	1,361	(866)	1,709	(1,579)
Profit (loss) for the year	(843)	2,617	703	1,627
Other comprehensive income (loss)	(14)	-	688	(951)
<b>Total comprehensive income (loss) for the year</b>	<b>(857)</b>	<b>2,617</b>	<b>1,391</b>	<b>676</b>
<b>As at December 31,</b>				
<b>Statement of financial position</b>				
Current assets	3,407	5,158	7,615	7,510
Non-current assets	24,904	21,186	29,089	25,481
Current liabilities	(1,793)	(1,428)	(2,462)	(5,365)
Non-current liabilities	(5,619)	(3,160)	(11,109)	(5,186)
<b>Net assets</b>	<b>20,899</b>	<b>21,756</b>	<b>23,133</b>	<b>22,440</b>
Proportion of the Group's ownership interest in joint ventures (%)	50.00	50.00	41.44	41.44
Investment amount over net asset at acquisition date	10,449	10,878	9,586	9,299
	-	-	3,038	3,038
<b>Carrying amount of interest in investee</b>	<b>10,449</b>	<b>10,878</b>	<b>12,624</b>	<b>12,337</b>
<i>Remark:</i>				
Cash and cash equivalents	1,097	854	1,835	1,344

The reconciliation of the summarised financial information to the carrying amount of the Group's interest in these companies.

	Unit : Million Baht			
	<u>PTT Asahi Chemical Co., Ltd.</u>		<u>HMC Polymers Co., Ltd.</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Group's interest in net assets of investee as at January 1,	10,878	9,569	12,337	12,885
Total comprehensive income (loss) attributable to the Group	(429)	1,309	576	280
Dividends received during the year	-	-	(289)	(828)
<b>Carrying amount of interest in investee as at December 31,</b>	<b>10,449</b>	<b>10,878</b>	<b>12,624</b>	<b>12,337</b>

*Immaterial joint ventures*

The summarised financial information for the Group's interest in immaterial joint ventures based on the amounts reported in the Group's consolidated financial statements:

	Unit : Million Baht	
	<u>Immaterial joint ventures</u>	
	<u>2020</u>	<u>2019</u>
<b>For the years ended December 31,</b>		
Carrying amount of interests in immaterial joint ventures	9,464	9,229
Group's share of:		
- Profit for the year	1,026	643
- Other comprehensive income (loss)	(2)	28
- Total comprehensive income for the year	1,024	671

**Change in investments in joint ventures**

*GGC KTIS Bioindustrial Co., Ltd.*

During the year ended December 31, 2020, GGC KTIS Bioindustrial Company Limited, an indirect joint venture of the Group, has called for paid-up capital from the capital increase of Baht 522.50 million from GGC Biochemicals Company Limited, of which fully received during the year ended December 31, 2020.

*Revolve Group Limited*

On March 26, 2019, Solution Creation Co., Ltd., a subsidiary, acquired 49% of shares of Revolve Group Limited (“RGL”) from previous shareholder and by subscription of newly issued shares of RGL. The subsidiary paid for the share purchase totalling pound sterling 6.4 million or equivalent to Baht 269.54 million according to Share Sale and Subscription Agreement. The investment is harmonised with the Company's business strategy that intends to expand the investment toward downstream and enhance the value chain of performance chemicals products.

**11. INVESTMENTS IN ASSOCIATES**

Movements of investments in associates for the years ended December 31, were as follows:

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>		<u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Associates</b>				
As at January 1,	29,829	15,450	26,813	9,793
Acquisition	1,027	17,020	733	17,020
Disposal	-	(212)	-	-
Share of profit of investments in associates	2,459	1,933	-	-
Share of other comprehensive income (loss)				
of investments in associates	34	(385)	-	-
Allowance for impairment	(9)	-	-	-
Dividend income	(1,294)	(875)	-	-
Difference arising from the change in the ownership interest in an investment <sup>(1)</sup>	-	(3,408)	-	-
Interests in equity of associate	-	319	-	-
Effect from translation differences on foreign investment	-	(13)	-	-
Effect from first-time adoption of new accounting policy (see Note 2.6)	(173)	-	-	-
<b>As at December 31,</b>	<b><u>31,873</u></b>	<b><u>29,829</u></b>	<b><u>27,546</u></b>	<b><u>26,813</u></b>

<sup>(1)</sup> *Difference arising from the change in the ownership interest in investment*

Global Power Synergy Public Company Limited (“GPSC”) had completed Tender Offer for shares of Glow Energy Public Company Limited (“GLOW”) on May 22, 2019 and December 2, 2019. In 2019, GPSC has made payment for shares to minority shareholders of totalling Baht 40,806.27 million. GPSC therefore directly and indirectly held 99.83%, increased from 69.11%, of the total authorised and paid-up shares. GPSC recognised the negative movement from change in ownership interest of Baht 14,991.99 million in its shareholders’ equity as at December 31, 2019. The Company therefore recognised this transaction as the difference arising from the change in the ownership interest in an investment, according to its shareholding interest in GPSC of 22.73%, amounting to Baht 3,407.68 million in shareholders’ equity.

Investments in associates as at December 31, 2020 and 2019, and dividend income for the years ended December 31, 2020 and 2019 were as follows:

Unit : Million Baht

<u>Consolidated financial statements</u>														
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Equity method</u>		<u>Impairment</u>		<u>Equity method - net</u>		<u>Dividend income</u>	
	<u>Interest (%)</u>													
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Direct associates</i>														
Global Power Synergy Plc.	23	23	28,197	28,197	22,753	22,753	23,378	22,599	-	-	23,378	22,599	833	443
Kuraray GC Advanced Materials Co., Ltd.	33	33	4,203	2,008	1,404	671	1,336	629	-	-	1,336	629	-	-
PTT Energy Solutions Co., Ltd.	20	20	150	150	30	30	48	42	-	-	48	42	-	-
PTT Digital Solutions Co., Ltd.	40	40	150	150	60	60	1,014	824	-	-	1,014	824	38	35
Vinythai Plc.	25	25	7,111	7,111	3,297	3,297	5,761	5,642	-	-	5,761	5,642	415	385
Eastern Fluid Transport Co., Ltd.	23	23	10	10	2	2	12	16	-	-	12	16	8	12
					<u>27,546</u>	<u>26,813</u>	<u>31,549</u>	<u>29,752</u>	<u>-</u>	<u>-</u>	<u>31,549</u>	<u>29,752</u>	<u>1,294</u>	<u>875</u>
<i>Indirect associates</i>														
Thai Eastern Top Seeds Oil Co., Ltd.	30	30	222	222	67	67	9	28	(9)	-	-	28	-	-
S.P. Petpack Inter Group Co., Ltd.	25	25	200	200	50	50	40	49	-	-	40	49	-	-
Dynachisso Thai Co., Ltd.	42	-	120	-	294	-	284	-	-	-	284	-	-	-
					<u>411</u>	<u>117</u>	<u>333</u>	<u>77</u>	<u>(9)</u>	<u>-</u>	<u>324</u>	<u>77</u>	<u>-</u>	<u>-</u>
<b>Total investments in associates</b>					<u><u>27,957</u></u>	<u><u>26,930</u></u>	<u><u>31,882</u></u>	<u><u>29,829</u></u>	<u><u>(9)</u></u>	<u><u>-</u></u>	<u><u>31,873</u></u>	<u><u>29,829</u></u>	<u><u>1,294</u></u>	<u><u>875</u></u>

Unit : Million Baht

	<u>Separate financial statements</u>													
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Impairment</u>		<u>At cost - net</u>		<u>Fair value of listed securities</u>		<u>Dividend income</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Associates</i>														
Global Power Synergy Plc.	23	23	28,197	28,197	22,753	22,753	-	-	22,753	22,753	47,267	54,959	833	443
Kuraray GC Advanced Materials Co., Ltd.	33	33	4,203	2,008	1,404	671	-	-	1,404	671	-	-	-	-
PTT Energy Solutions Co., Ltd.	20	20	150	150	30	30	-	-	30	30	-	-	-	-
PTT Digital Solutions Co., Ltd.	40	40	150	150	60	60	-	-	60	60	-	-	38	35
Vinythai Plc.	25	25	7,111	7,111	3,297	3,297	-	-	3,297	3,297	9,473	7,475	415	385
Eastern Fluid Transport Co., Ltd.	15	15	10	10	2	2	-	-	2	2	-	-	6	8
<b>Total investments in associates</b>					<b>27,546</b>	<b>26,813</b>	<b>-</b>	<b>-</b>	<b>27,546</b>	<b>26,813</b>	<b>56,740</b>	<b>62,434</b>	<b>1,292</b>	<b>871</b>



*Associates*

The following table summarises the financial information of the associate as included in its own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarised financial information to the carrying amount of the Group's interest in the associate.

	<b>Unit : Million Baht</b>	
	<b><u>Global Power Synergy Plc.</u></b>	
	<b><u>2020</u></b>	<b><u>2019</u></b>
<b>For the years ended December 31,</b>		
<b>Statement of profit or loss</b>		
Revenue	68,757	65,789
Profit for the year	7,509	3,893
Other comprehensive loss	(146)	(1,452)
<b>Total comprehensive income for the year</b>	<b><u>7,363</u></b>	<b><u>2,441</u></b>
<b>As at December 31,</b>		
<b>Statement of financial position</b>		
Current assets	43,453	38,760
Non-current assets	213,146	212,952
Current liabilities	(22,063)	(39,055)
Non-current liabilities	(122,726)	(103,949)
<b>Net assets</b>	<b><u>111,810</u></b>	<b><u>108,708</u></b>
Non-controlling interests	(8,961)	(9,283)
<b>Total attributions to owners of the parent</b>	<b><u>102,849</u></b>	<b><u>99,425</u></b>
Proportion of the Group's ownership interest in associate (%)	22.73	22.73
<b>Carrying amount of interest in investee</b>	<b><u>23,378</u></b>	<b><u>22,599</u></b>
<i>Remark:</i>		
Cash and cash equivalents	20,289	18,839

The reconciliation of the summarised financial information to the carrying amount of the Group's interest in this associate.

	<b>Unit : Million Baht</b>	
	<b><u>Global Power Synergy Plc.</u></b>	
	<b><u>2020</u></b>	<b><u>2019</u></b>
Group's interest in net assets of investee as at January 1,	22,599	8,756
Total comprehensive income attributable to the Group	1,785	556
Dividends received during the year	(833)	(443)
Acquisition	-	16,819
Difference arising from the change in the ownership interest in an investment <sup>(1)</sup>	-	(3,408)
Invest in equity of associate	-	319
Effect from first-time adoption of new accounting policy	(173)	-
<b>Carrying amount of interest in investee as at December 31,</b>	<b><u>23,378</u></b>	<b><u>22,599</u></b>

*Immaterial associates*

The summarised financial information for the Group's interest in immaterial associates based on the amounts reported in the Group's consolidated financial statements:

	<b>Unit : Million Baht</b>	
	<b><u>Immaterial associates</u></b>	
	<b><u>2020</u></b>	<b><u>2019</u></b>
<b>For the years ended December 31,</b>		
Carrying amount of interests in immaterial associates	8,495	7,230
Group's share of:		
- Profit for the year	691	1,049
- Other comprehensive loss	(45)	(69)
- Total comprehensive income for the year	646	980

***Change in investment in associates***

*Global Power Synergy Plc.*

On August 28, 2019, the Extraordinary General Meeting No.1/2019 of Global Power Synergy Plc. ("GPSC") passed a resolution approving the registered capital increase of GPSC by issuing 1,321,428,571 ordinary shares, with a par value of Baht 10 per share amounting to Baht 13,214,285,710. From the original registered capital amounting to Baht 14,983,008,000 to a new registered capital amounting to Baht 28,197,293,710, and GPSC had received such share subscription amounting to Baht 13,214,285,670. On October 9, 2019, GPSC has already registered the change of registered capital and, on September 26, 2019, GPSC called for paid-up capital from the capital increase in the number proportionate to its shareholding GPSC of 300,344,470 shares at Baht 56 per share, totalling Baht 16,819.29 million, of which fully received in October 2019.

*Kuraray GC Advanced Materials Co., Ltd.*

On December 25, 2019 and during the year ended December 31, 2020, Kuraray GC Advanced Materials Co., Ltd., a direct associate of the Group, has called for paid-up capital from the capital increase of 7,331,300 shares at Baht 100 per share, totalling Baht 733.13 million, of which fully received during the year ended December 31, 2020.

On November 18, 2019, Kuraray GC Advanced Materials Co., Ltd., a direct associate of the Group, has called for paid-up capital from the capital increase of 2,004,000 shares at Baht 100 per share, totalling Baht 200.40 million, of which fully received in December 2019.

*Dynachisso Thai Co., Ltd.*

On July 31, 2020, Solution Creation Co., Ltd., a subsidiary, acquired 41.5% shares of Dynachisso Thai Co., Ltd. to advance in the PP compound engineering plastic business from Dynachem (Hong Kong) Limited. The subsidiary paid for the share purchase totalling Baht 293.82 million according to Share Sale and Subscription Agreement. The investment is aligned with the Company's business strategy to enhance competitiveness and add value to products to meet customer's demands.

12. OTHER INVESTMENTS AND INVESTMENTS IN FINANCIAL ASSETS

Other investments and investments in financial assets as at December 31, 2020 and 2019 consisted of:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Temporary investments</b>				
Held-to-maturities debt securities	-	6,175	-	3,500
Available-for-sale debt securities (Private funds)	-	545	-	545
<b>Total temporary investments</b>	<b>-</b>	<b>6,720</b>	<b>-</b>	<b>4,045</b>
	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Current investments in financial assets</b>				
Financial assets at amortisation costs				
- Deposit at bank	16,275	-	15,875	-
Financial assets at fair value through other comprehensive income				
- Corporate bond	70	-	70	-
<b>Total current investments in financial assets</b>	<b>16,345</b>	<b>-</b>	<b>15,945</b>	<b>-</b>
	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Other long-term investments</b>				
Held-to-maturities debt securities	-	480	-	450
Available-for-sale debt securities (Private funds)	-	1,503	-	1,503
Available-for-sale equity securities	-	384	-	384
Other non-marketable equity securities:				
- Exeltium SAS (4% shareholding by the Group)	-	238	-	-
- Others	-	306	-	4
<b>Total other long-term investments</b>	<b>-</b>	<b>2,911</b>	<b>-</b>	<b>2,341</b>
	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Non-current investments in financial assets</b>				
Financial assets at fair value through profit or loss	382	-	352	-
Financial assets at fair value through other comprehensive income				
- Corporate bond	36	-	36	-
- Equity instruments	670	-	4	-
<b>Total non-current investments in financial assets</b>	<b>1,088</b>	<b>-</b>	<b>392</b>	<b>-</b>

The fair value of the investments and the valuation methodology for these investments are disclosed in Note 35 and the dividends received in respect of these investments as recorded in the consolidated and separate financial statements totaling Baht 14 million.

Other gains (losses) arising on these investments for the year ended December 31, 2020 were as follows:

	<u>Consolidated</u> <u>financial statements</u>	<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>
Net loss arising on financial assets mandatorily measured at FVTPL	(32)	(32)
Reclassification of net gain on debt investments classified as at FVTOCI from equity to profit or loss upon disposal	34	34
<b>Total</b>	<u>2</u>	<u>2</u>

### 13. INVESTMENT PROPERTIES

Investment properties as at December 31, 2020 and 2019 consisted of:

	<u>Land</u>	<u>Consolidated</u> <u>financial statements</u> <u>Buildings</u>	<u>Total</u>	<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u> <u>Land</u>
<i>Cost</i>				
As at January 1, 2019	6,459	41	6,500	1,741
<b>As at December 31, 2019 and January 1, 2020</b>	<u>6,459</u>	<u>41</u>	<u>6,500</u>	<u>1,741</u>
Transfers	(420)	(14)	(434)	-
Disposals	(4)	-	(4)	-
<b>As at December 31, 2020</b>	<u>6,035</u>	<u>27</u>	<u>6,062</u>	<u>1,741</u>
<i>Accumulated depreciation</i>				
As at January 1, 2019	-	(1)	(1)	-
Depreciation charge for the year	-	(1)	(1)	-
<b>As at December 31, 2019 and January 1, 2020</b>	<u>-</u>	<u>(2)</u>	<u>(2)</u>	<u>-</u>
Depreciation charge for the year	-	(2)	(2)	-
Transfers	-	1	1	-
<b>As at December 31, 2020</b>	<u>-</u>	<u>(3)</u>	<u>(3)</u>	<u>-</u>
<i>Net book value</i>				
As at January 1, 2019	6,459	40	6,499	1,741
<b>As at December 31, 2019 and January 1, 2020</b>	<u>6,459</u>	<u>39</u>	<u>6,498</u>	<u>1,741</u>
<b>As at December 31, 2020</b>	<u>6,035</u>	<u>24</u>	<u>6,059</u>	<u>1,741</u>

The fair value of investment properties of the Group as at December 31, 2020 of Baht 8,019 million (2019: Baht 8,435 million) was determined at open market values on an existing use basis and income approach. The fair value measurement for investment properties has been categorised as Levels 2 and 3 fair value, respectively.

The fair value of investment properties of the Company as at December 31, 2020 of Baht 3,700 million (2019: Baht 3,700 million) was determined at open market values on an existing use basis. The fair value measurement for investment properties has been categorised as a Level 2 fair value.

### Measurement of fair value

#### *Level 2 fair value*

The fair value of investment properties for land was determined by independent property valuers at open market values by scoring and weighted other different factors.

#### *Level 3 fair value*

The fair value of investment properties for land and buildings was determined by the Group at income approach. The significant unobservable inputs comprise yield rate and finance costs.

Amounts recognised in the statements of profit or loss that are related to investment properties for the years ended December 31, are as follows:

	<u>Consolidated</u> <u>financial statements</u>		<b>Unit : Million Baht</b> <u>Separate</u> <u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Rental income	130	122	167	162

14. PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment as at December 31, 2020 and 2019 consist of:

Unit : Million Baht

<u>Consolidated financial statements</u>								
	<u>Note</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<i>Cost</i>								
As at January 1, 2019		12,263	364,527	17,614	2,798	881	40,966	439,049
Additions		76	2,073	37	300	251	30,837	33,574
Transfers		41	10,458	406	91	1	(11,057)	(60)
Disposals		-	(3,918)	(8)	(204)	(168)	(18)	(4,316)
Effect of change in foreign exchange rates		(111)	(980)	(130)	(11)	-	(458)	(1,690)
<b>As at December 31, 2019</b>		<b>12,269</b>	<b>372,160</b>	<b>17,919</b>	<b>2,974</b>	<b>965</b>	<b>60,270</b>	<b>466,557</b>
Effect from first-time adoption of new accounting policy	2.6	(57)	(3)	(8)	(420)	(232)	-	(720)
<b>As at January 1, 2020</b>		<b>12,212</b>	<b>372,157</b>	<b>17,911</b>	<b>2,554</b>	<b>733</b>	<b>60,270</b>	<b>465,837</b>
Additions		39	1,220	37	207	6	20,805	22,314
Transfers		654	32,293	1,743	19	54	(33,983)	780
Disposals		(67)	(2,873)	(8)	(39)	(19)	(21)	(3,027)
Effect of change in foreign exchange rates		18	801	119	1	2	(37)	904
<b>As at December 31, 2020</b>		<b>12,856</b>	<b>403,598</b>	<b>19,802</b>	<b>2,742</b>	<b>776</b>	<b>47,034</b>	<b>486,808</b>

Unit : Million Baht

**Consolidated financial statements**

	<u>Note</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<b><i>Accumulated depreciation and allowance for impairment</i></b>								
As at January 1, 2019		(1,370)	(175,379)	(7,764)	(2,006)	(645)	(1,555)	(188,719)
Depreciation charge for the year		(99)	(16,937)	(727)	(327)	(98)	-	(18,188)
Transfers		-	(25)	-	-	(2)	-	(27)
Disposals		-	3,875	4	191	168	-	4,238
Reversal of impairment losses		3	-	-	-	-	-	3
Effect of change in foreign exchange rates		38	508	53	9	-	91	699
<b>As at December 31, 2019</b>		<b>(1,428)</b>	<b>(187,958)</b>	<b>(8,434)</b>	<b>(2,133)</b>	<b>(577)</b>	<b>(1,464)</b>	<b>(201,994)</b>
Effect from first-time adoption of new accounting policy	2.6	57	3	8	166	110	-	344
<b>As at January 1, 2020</b>		<b>(1,371)</b>	<b>(187,955)</b>	<b>(8,426)</b>	<b>(1,967)</b>	<b>(467)</b>	<b>(1,464)</b>	<b>(201,650)</b>
Depreciation charge for the year		(92)	(17,158)	(738)	(207)	(62)	-	(18,257)
Transfers		(4)	(440)	(2)	23	(44)	-	(467)
Disposals		2	2,724	7	38	18	-	2,789
Reversal of impairment losses		-	371	-	-	-	-	371
Effect of change in foreign exchange rates		2	(374)	(50)	(1)	1	5	(417)
<b>As at December 31, 2020</b>		<b>(1,463)</b>	<b>(202,832)</b>	<b>(9,209)</b>	<b>(2,114)</b>	<b>(554)</b>	<b>(1,459)</b>	<b>(217,631)</b>

Unit : Million Baht

Consolidated financial statements

	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<i>Net book value</i>							
<b>As at January 1, 2019</b>							
Owned assets	10,893	189,148	9,850	618	109	39,411	250,029
Assets under finance leases	-	-	-	174	127	-	301
	<b>10,893</b>	<b>189,148</b>	<b>9,850</b>	<b>792</b>	<b>236</b>	<b>39,411</b>	<b>250,330</b>
<b>As at December 31, 2019</b>							
Owned assets	10,841	184,202	9,485	587	266	58,806	264,187
Assets under finance leases	-	-	-	254	122	-	376
	<b>10,841</b>	<b>184,202</b>	<b>9,485</b>	<b>841</b>	<b>388</b>	<b>58,806</b>	<b>264,563</b>
<b>As at January 1, 2020</b>							
Owned assets	10,841	184,202	9,485	587	266	58,806	264,187
Assets under finance leases	-	-	-	-	-	-	-
	<b>10,841</b>	<b>184,202</b>	<b>9,485</b>	<b>587</b>	<b>266</b>	<b>58,806</b>	<b>264,187</b>
<b>As at December 31, 2020</b>							
Owned assets	11,393	200,755	10,593	628	222	45,575	269,166
Assets under hire purchase agreement	-	11	-	-	-	-	11
	<b>11,393</b>	<b>200,766</b>	<b>10,593</b>	<b>628</b>	<b>222</b>	<b>45,575</b>	<b>269,177</b>



The gross amount of the Group's fully depreciated buildings and equipment that was still in use as at December 31, 2020 amounted to Baht 25,026 million (2019: Baht 20,213 million).

#### *Security*

As at December 31, 2020, net book value of assets of the Group of Baht 14,638 million (2019: Baht 15,837 million) were registered to secured loan from financial institutions (see Note 20.2). In addition, the Group pledged some of the machinery, bank accounts and various rights as collateral as reported to the financial institutions.

#### *Property, plant and equipment under construction*

As at December 31, 2020, capitalised borrowing costs, relating to the acquisition of the land and the construction of the new factory, were included in a part of purchases of assets amounted to Baht 947 million in the consolidated statements of financial position (2019: Baht 735 million). The Group capitalised borrowing costs using the rates of 2.60% to 5.00% per annum (2019: 3.59% to 5.00% per annum).

#### *Reversal of impairment loss for machinery and equipment*

In 2020, a subsidiary has considered to reverse impairment loss for machinery and equipment which had been previously recognized as allowance for impairment of unused machinery and equipment. In estimating the reversal of impairment loss, the management has changed the estimation used to determine the increased recoverable amount in consideration to the improving market situation as well as the increasing in demand of products from expansion of customers' capacity.

Unit : Million Baht

Separate financial statements

	<u>Note</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<b>Cost</b>								
As at January 1, 2019		4,898	281,112	9,704	1,742	557	20,503	318,516
Additions		20	1,703	33	225	227	17,907	20,115
Transfers		34	6,481	64	50	-	(6,659)	(30)
Disposals		-	(2,696)	(3)	(124)	(146)	(15)	(2,984)
<b>As at December 31, 2019</b>		<b>4,952</b>	<b>286,600</b>	<b>9,798</b>	<b>1,893</b>	<b>638</b>	<b>31,736</b>	<b>335,617</b>
Effect from first-time adoption of new accounting policy	2.6	-	-	-	(323)	(148)	-	(471)
<b>As at January 1, 2020</b>		<b>4,952</b>	<b>286,600</b>	<b>9,798</b>	<b>1,570</b>	<b>490</b>	<b>31,736</b>	<b>335,146</b>
Additions		3	638	19	152	-	12,954	13,766
Transfers		50	6,375	327	35	52	(6,849)	(10)
Disposals		(3)	(2,455)	-	(17)	(14)	(5)	(2,494)
<b>As at December 31, 2020</b>		<b>5,002</b>	<b>291,158</b>	<b>10,144</b>	<b>1,740</b>	<b>528</b>	<b>37,836</b>	<b>346,408</b>
<b>Accumulated depreciation</b>								
As at January 1, 2019		(596)	(137,191)	(4,323)	(1,232)	(414)	(270)	(144,026)
Depreciation charge for the year		(55)	(12,048)	(406)	(218)	(68)	-	(12,795)
Disposals		-	2,665	2	124	145	-	2,936
<b>As at December 31, 2019</b>		<b>(651)</b>	<b>(146,574)</b>	<b>(4,727)</b>	<b>(1,326)</b>	<b>(337)</b>	<b>(270)</b>	<b>(153,885)</b>
Effect from first-time adoption of new accounting policy	2.6	-	-	-	124	72	-	196
<b>As at January 1, 2020</b>		<b>(651)</b>	<b>(146,574)</b>	<b>(4,727)</b>	<b>(1,202)</b>	<b>(265)</b>	<b>(270)</b>	<b>(153,689)</b>
Depreciation charge for the year		(45)	(12,019)	(414)	(132)	(52)	-	(12,662)
Transfers		-	-	-	(5)	(41)	-	(46)
Disposals		2	2,393	-	17	12	-	2,424
<b>As at December 31, 2020</b>		<b>(694)</b>	<b>(156,200)</b>	<b>(5,141)</b>	<b>(1,322)</b>	<b>(346)</b>	<b>(270)</b>	<b>(163,973)</b>

Unit : Million Baht

Separate financial statements

	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<i>Net book value</i>							
<b>As at January 1, 2019</b>							
Owned assets	4,302	143,921	5,381	371	63	20,233	174,271
Assets under finance leases	-	-	-	139	80	-	219
	<b>4,302</b>	<b>143,921</b>	<b>5,381</b>	<b>510</b>	<b>143</b>	<b>20,233</b>	<b>174,490</b>
<b>As at December 31, 2019</b>							
Owned assets	4,301	140,026	5,071	368	225	31,466	181,457
Assets under finance leases	-	-	-	199	76	-	275
	<b>4,301</b>	<b>140,026</b>	<b>5,071</b>	<b>567</b>	<b>301</b>	<b>31,466</b>	<b>181,732</b>
<b>As at January 1, 2020</b>							
Owned assets	4,301	140,026	5,071	368	225	31,466	181,457
Assets under finance leases	-	-	-	-	-	-	-
	<b>4,301</b>	<b>140,026</b>	<b>5,071</b>	<b>368</b>	<b>225</b>	<b>31,466</b>	<b>181,457</b>
<b>As at December 31, 2020</b>							
Owned assets	4,308	134,958	5,003	418	182	37,566	182,435
Assets under finance leases	-	-	-	-	-	-	-
	<b>4,308</b>	<b>134,958</b>	<b>5,003</b>	<b>418</b>	<b>182</b>	<b>37,566</b>	<b>182,435</b>

The gross amount of the Company's fully depreciated buildings and equipment that was still in use as at December 31, 2020 amounted to Baht 16,428 million (2019: Baht 12,612 million).

*Property, plant and equipment under construction*

As at December 31, 2020, capitalised borrowing costs, relating to the acquisition of the land and the construction of the new factory, were included in a part of purchases of assets amounted to Baht 459 million in the separate statements of financial position (2019: Baht 329 million). In 2020 and 2019, the Company capitalised borrowing costs using the rates of 5.00% per annum.

15. RIGHT-OF-USE ASSETS

Movements of right-of-use assets during the year ended December 31, 2020 were as follows:

							Unit : Million Baht
							<u>Consolidated financial statements</u>
	<u>Note</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and equipment</u>	<u>Vehicles</u>	<u>Total</u>
<b>Cost</b>							
As at January 1, 2020		-	-	-	-	-	-
Effect from first-time adoption of new accounting policy	2.6	4,309	1,275	331	430	554	6,899
Additions		2,360	199	15	104	183	2,861
Transfers		11	362	-	23	(55)	341
Termination		-	(15)	-	(21)	(18)	(54)
Modification		-	-	(1)	-	(5)	(6)
Effect of change in foreign exchange rates		(1)	9	7	-	3	18
<b>As at December 31, 2020</b>		<b>6,679</b>	<b>1,830</b>	<b>352</b>	<b>536</b>	<b>662</b>	<b>10,059</b>
<b>Accumulated depreciation and allowance for impairment</b>							
As at January 1, 2020		-	-	-	-	-	-
Effect from first-time adoption of new accounting policy	2.6	(999)	(343)	(7)	(166)	(109)	(1,624)
Depreciation charge for the year		(343)	(309)	(126)	(150)	(205)	(1,133)
Transfers		-	(268)	-	(24)	44	(248)
Termination		-	2	-	21	9	32
Loss on impairment of assets		(49)	-	-	-	-	(49)
Effect of change in foreign exchange rates		3	(1)	-	-	-	2
<b>As at December 31, 2020</b>		<b>(1,388)</b>	<b>(919)</b>	<b>(133)</b>	<b>(319)</b>	<b>(261)</b>	<b>(3,020)</b>
<b>Net book value</b>							
As at January 1, 2020		-	-	-	-	-	-
<b>As at December 31, 2020</b>		<b>5,291</b>	<b>911</b>	<b>219</b>	<b>217</b>	<b>401</b>	<b>7,039</b>

Unit : Million Baht

	<u>Note</u>	<u>Separate financial statements</u>					<u>Total</u>
		<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and equipment</u>	<u>Vehicles</u>	
<b>Cost</b>							
As at January 1, 2020		-	-	-	-	-	-
Effect from first-time adoption of new accounting policy	2.6	3,531	1,841	96	323	388	6,179
Additions		2,337	134	2	82	92	2,647
Transfers		-	2	-	(7)	(52)	(57)
Termination		-	(4)	-	(14)	(7)	(25)
Modification		-	(6)	(1)	-	-	(7)
<b>As at December 31, 2020</b>		<b>5,868</b>	<b>1,967</b>	<b>97</b>	<b>384</b>	<b>421</b>	<b>8,737</b>
<b>Accumulated depreciation and allowance for impairment</b>							
As at January 1, 2020		-	-	-	-	-	-
Effect from first-time adoption of new accounting policy	2.6	(946)	(316)	-	(124)	(72)	(1,458)
Depreciation charge for the year		(239)	(552)	(55)	(114)	(136)	(1,096)
Transfers		-	(3)	-	7	41	45
Termination		-	1	-	13	5	19
<b>As at December 31, 2020</b>		<b>(1,185)</b>	<b>(870)</b>	<b>(55)</b>	<b>(218)</b>	<b>(162)</b>	<b>(2,490)</b>
<b>Net book value</b>							
As at January 1, 2020		-	-	-	-	-	-
<b>As at December 31, 2020</b>		<b>4,683</b>	<b>1,097</b>	<b>42</b>	<b>166</b>	<b>259</b>	<b>6,247</b>

Amount recognised in profit and loss for the year ended December 31, 2020 are as follows:

	<u>Consolidated</u> <u>financial statements</u> 2020	Unit : Million Baht <u>Separate</u> <u>financial statements</u> 2020
Depreciation expense on right-of-use assets	1,133	1,096
Interest expense on lease liabilities		
- net of interest capitalised as part of asset under construction	170	160
Expense relating to short-term leases	114	206
Expense relating to leases of low value assets	14	6
Expense relating to variable lease payments not included in the measurement of the lease liability	1	57
Income from sub-leasing right-of-use assets	1	2

The maturity analysis of lease liabilities is presented in Note 21.

#### 16. LAND LEASEHOLD RIGHT

Land leasehold right as at December 31, 2020 and 2019 consist of:

	<u>Note</u>	<u>Consolidated</u> <u>financial statements</u>	Unit : Million Baht <u>Separate</u> <u>financial statements</u>
<b>Cost</b>			
As at January 1, 2019		1,131	1,130
Additions		7	-
<b>As at December 31, 2019 and January 1, 2020</b>		<b>1,138</b>	<b>1,130</b>
Effect from first-time adoption of new accounting policy	2.6	(1,130)	(1,130)
Transfer		(8)	-
<b>As at December 31, 2020</b>		<b>-</b>	<b>-</b>
<b>Accumulated amortisation</b>			
As at January 1, 2019		(897)	(896)
Amortisation charge for the year		(50)	(50)
<b>As at December 31, 2019 and January 1, 2020</b>		<b>(947)</b>	<b>(946)</b>
Effect from first-time adoption of new accounting policy	2.6	946	946
Transfer		1	-
<b>As at December 31, 2020</b>		<b>-</b>	<b>-</b>
<b>Net book value</b>			
<b>As at January 1, 2019</b>		<b>234</b>	<b>234</b>
<b>As at December 31, 2019 and January 1, 2020</b>		<b>191</b>	<b>184</b>
<b>As at December 31, 2020</b>		<b>-</b>	<b>-</b>

17. GOODWILL

Goodwill as at December 31, 2020 and 2019 consist of:

	<b>Unit : Million Baht</b>
	<b><u>Consolidated</u></b>
	<b><u>financial statements</u></b>
<i>Cost</i>	
As at January 1, 2019	1,648
<b>As at December 31, 2019 and January 1, 2020</b>	<b>1,648</b>
<b>As at December 31, 2020</b>	<b>1,648</b>
<i>Allowance for impairment</i>	
As at January 1, 2019	(717)
<b>As at December 31, 2019 and January 1, 2020</b>	<b>(717)</b>
<b>As at December 31, 2020</b>	<b>(717)</b>
<i>Net book value</i>	
As at January 1, 2019	931
<b>As at December 31, 2019 and January 1, 2020</b>	<b>931</b>
<b>As at December 31, 2020</b>	<b>931</b>



18. INTANGIBLE ASSETS

Intangible assets as at December 31, 2020 and 2019 consist of:

Unit : Million Baht

		<u>Consolidated financial statements</u>						
	<u>Note</u>	<u>Production licence fees</u>	<u>Computer software</u>	<u>Customer contracts and the related customer relationships</u>	<u>Right to use pipe rack</u>	<u>Right to use others</u>	<u>Intangible assets under development</u>	<u>Total</u>
<i>Cost</i>								
As at January 1, 2019		7,165	4,609	148	530	2,503	736	15,691
Additions		274	19	-	-	5	733	1,031
Transfers		268	389	-	17	41	(703)	12
Disposals		-	(7)	-	-	-	(86)	(93)
Effect of change in foreign exchange rates		-	(13)	(11)	-	(169)	(3)	(196)
<b>As at December 31, 2019 and January 1, 2020</b>		<b>7,707</b>	<b>4,997</b>	<b>137</b>	<b>547</b>	<b>2,380</b>	<b>677</b>	<b>16,445</b>
Effect from first-time adoption of new accounting policy	2.6	-	-	-	(440)	(56)	-	(496)
Additions		215	44	-	-	-	1,097	1,356
Transfers		887	425	-	(51)	(327)	(1,324)	(390)
Disposals		-	(9)	-	-	-	-	(9)
Effect of change in foreign exchange rates		-	10	1	-	80	-	91
<b>As at December 31, 2020</b>		<b>8,809</b>	<b>5,467</b>	<b>138</b>	<b>56</b>	<b>2,077</b>	<b>450</b>	<b>16,997</b>

Unit : Million Baht

<u>Consolidated financial statements</u>								
	<u>Note</u>	<u>Production licence fees</u>	<u>Computer Software</u>	<u>Customer contracts and the related customer relationships</u>	<u>Right to use pipe rack</u>	<u>Right to use others</u>	<u>Intangible assets under development</u>	<u>Total</u>
<i>Accumulated amortisation and allowance for impairment</i>								
As at January 1, 2019		(2,598)	(2,668)	(140)	(387)	(1,821)	(22)	(7,636)
Amortisation charge for the year		(268)	(342)	(7)	(31)	(117)	-	(765)
Transfers		-	4	-	-	22	-	26
Disposals		-	5	-	-	-	-	5
Effect of change in foreign exchange rates		-	12	10	-	124	-	146
<b>As at December 31, 2019 and January 1, 2020</b>		<b>(2,866)</b>	<b>(2,989)</b>	<b>(137)</b>	<b>(418)</b>	<b>(1,792)</b>	<b>(22)</b>	<b>(8,224)</b>
Effect from first-time adoption of new accounting policy	2.6	-	-	-	345	-	-	345
Amortisation charge for the year		(299)	(374)	-	(2)	(71)	-	(746)
Transfers		-	-	-	19	253	-	272
Disposal		-	4	-	-	-	-	4
Effect of change in foreign exchange rates		-	(10)	(1)	-	(45)	-	(56)
<b>As at December 31, 2020</b>		<b>(3,165)</b>	<b>(3,369)</b>	<b>(138)</b>	<b>(56)</b>	<b>(1,655)</b>	<b>(22)</b>	<b>(8,405)</b>
<i>Net book value</i>								
As at January 1, 2019		<u>4,567</u>	<u>1,941</u>	<u>8</u>	<u>143</u>	<u>682</u>	<u>714</u>	<u>8,055</u>
As at December 31, 2019 and January 1, 2020		<u>4,841</u>	<u>2,008</u>	<u>-</u>	<u>129</u>	<u>588</u>	<u>655</u>	<u>8,221</u>
As at December 31, 2020		<u>5,644</u>	<u>2,098</u>	<u>-</u>	<u>-</u>	<u>422</u>	<u>428</u>	<u>8,592</u>

Unit : Million Baht

	<i>Note</i>	<u>Separate financial statements</u>				<u>Intangible assets under development</u>	<u>Total</u>
		<u>Production licence fees</u>	<u>Computer software</u>	<u>Right to use pipe rack</u>	<u>Right to use others</u>		
<b>Cost</b>							
As at January 1, 2019		5,292	3,609	434	-	405	9,740
Additions		233	4	-	-	545	782
Transfers		267	219	20	-	(506)	-
Disposals		-	-	-	-	(62)	(62)
<b>As at December 31, 2019 and January 1, 2020</b>		<b>5,792</b>	<b>3,832</b>	<b>454</b>	<b>-</b>	<b>382</b>	<b>10,460</b>
Effect from first-time adoption of new accounting policy	2.6	-	-	(403)	-	-	(403)
Additions		213	16	-	-	428	657
Transfers		25	344	(51)	61	(379)	-
Disposals		-	-	-	-	-	-
<b>As at December 31, 2020</b>		<b>6,030</b>	<b>4,192</b>	<b>-</b>	<b>61</b>	<b>431</b>	<b>10,714</b>
<b>Accumulated amortisation</b>							
As at January 1, 2019		(1,833)	(1,976)	(305)	-	(22)	(4,136)
Amortisation charge for the year		(214)	(273)	(28)	-	-	(515)
Disposals		-	-	-	-	-	-
<b>As at December 31, 2019 and January 1, 2020</b>		<b>(2,047)</b>	<b>(2,249)</b>	<b>(333)</b>	<b>-</b>	<b>(22)</b>	<b>(4,651)</b>
Effect from first-time adoption of new accounting policy	2.6	-	-	316	-	-	316
Amortisation charge for the year		(243)	(298)	(2)	(4)	-	(547)
Transfers		-	-	19	(19)	-	-
Disposals		-	-	-	-	-	-
<b>As at December 31, 2020</b>		<b>(2,290)</b>	<b>(2,547)</b>	<b>-</b>	<b>(23)</b>	<b>(22)</b>	<b>(4,882)</b>
<b>Net book value</b>							
As at January 1, 2019		<b>3,459</b>	<b>1,633</b>	<b>129</b>	<b>-</b>	<b>383</b>	<b>5,604</b>
As at December 31, 2019 and January 1, 2020		<b>3,745</b>	<b>1,583</b>	<b>121</b>	<b>-</b>	<b>360</b>	<b>5,809</b>
As at December 31, 2020		<b>3,740</b>	<b>1,645</b>	<b>-</b>	<b>38</b>	<b>409</b>	<b>5,832</b>

**19. INCOME TAX EXPENSE AND DEFERRED TAX**

*Income tax (income) expense*

Income tax (income) expense for the years ended December 31, 2020 and 2019 consisted of:

	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>		<u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Current tax (income) expense</i>				
Current year	750	800	-	281
Over provided in prior years	(49)	(22)	(51)	(17)
	<u>701</u>	<u>778</u>	<u>(51)</u>	<u>264</u>
<i>Deferred tax (income) expense</i>				
Movements in temporary differences	(810)	(129)	(608)	(190)
<b>Total</b>	<b><u>(109)</u></b>	<b><u>649</u></b>	<b><u>(659)</u></b>	<b><u>74</u></b>

*Reconciliation of effective tax rate*

	<u>Consolidated financial statements</u>			
	<u>2020</u>		<u>2019</u>	
	<i>Rate</i> <i>(%)</i>		<i>Rate</i> <i>(%)</i>	
Profit before income tax		543		12,999
Income tax using the Thai corporation tax rate	20.0	109	20.0	2,600
Effect of different tax rates in foreign jurisdictions		(42)		9
Income not subject to tax		(154)		(232)
Non-deductible tax expenses		538		351
Tax loss carryforward		(574)		(133)
Over provided in prior years		(49)		(22)
Share of profit of investments in joint ventures and associate		(665)		(857)
Temporary differences		(810)		(129)
Others		1,538		(938)
<b>Income tax (income) expense</b>	<b>-</b>	<b><u>(109)</u></b>	<b><u>5.0</u></b>	<b><u>649</u></b>

	<u>Separate financial statements</u>			
	<u>2020</u>		<u>2019</u>	
	<i>Rate</i> <i>(%)</i>		<i>Rate</i> <i>(%)</i>	
Profit (loss) before income tax		(4,039)		9,227
Income tax using the Thai corporation tax rate	20.0	(808)	20.0	1,845
Income not subject to tax		(640)		(1,363)
Non-deductible tax expenses		26		215
Over provided in prior years		(51)		(17)
Temporary differences		(608)		(190)
Others		1,422		(416)
<b>Income tax (income) expense</b>	<b>-</b>	<b><u>(659)</u></b>	<b><u>0.8</u></b>	<b><u>74</u></b>

*Deferred Tax*

Movements in total deferred tax assets and liabilities during the years were as follows:

Unit : Million Baht

	<u>Consolidated financial statements</u>					<u>As at December 31, 2020</u>
	<u>(Charged) / credited to:</u>					
	<u>As at January 1, 2020</u>	<u>Profit or loss</u>	<u>Other comprehensive income (loss)</u>	<u>Exchange differences</u>	<u>Acquisition of businesses</u>	
<i>Deferred tax assets</i>						
Provisions for employee benefits	990	89	66	-	-	1,145
Property, plant and equipment	682	96	-	-	-	778
Lease liabilities	-	82	-	-	-	82
Tax loss carry forward	704	930	-	(1)	-	1,633
Others	102	(27)	(52)	2	-	25
<b>Total</b>	<b>2,478</b>	<b>1,170</b>	<b>14</b>	<b>1</b>	<b>-</b>	<b>3,663</b>
<i>Deferred tax liabilities</i>						
Property, plant and equipment	(3,696)	(319)	-	(12)	-	(4,027)
Right-of-use assets	-	(1)	-	-	-	(1)
Others	(174)	(40)	50	-	-	(164)
<b>Total</b>	<b>(3,870)</b>	<b>(360)</b>	<b>50</b>	<b>(12)</b>	<b>-</b>	<b>(4,192)</b>
<b>Net</b>	<b>(1,392)</b>	<b>810</b>	<b>64</b>	<b>(11)</b>	<b>-</b>	<b>(529)</b>

Unit : Million Baht

	<u>Consolidated financial statements</u>					<u>As at December 31, 2019</u>
	<u>(Charged) / credited to:</u>					
	<u>As at January 1, 2019</u>	<u>Profit or loss</u>	<u>Other comprehensive income (loss)</u>	<u>Exchange differences</u>	<u>Acquisition of businesses</u>	
<i>Deferred tax assets</i>						
Inventories	12	(8)	-	-	-	4
Provisions for employee benefits	725	262	3	-	-	990
Tax loss carry forward	848	(143)	-	-	(1)	704
Others	647	77	59	-	(3)	780
<b>Total</b>	<b>2,232</b>	<b>188</b>	<b>62</b>	<b>-</b>	<b>(4)</b>	<b>2,478</b>
<i>Deferred tax liabilities</i>						
Property, plant and equipment	(3,469)	(231)	-	(11)	15	(3,696)
Finance lease assets	(6)	-	-	-	-	(6)
Others	(333)	172	(8)	-	1	(168)
<b>Total</b>	<b>(3,808)</b>	<b>(59)</b>	<b>(8)</b>	<b>(11)</b>	<b>16</b>	<b>(3,870)</b>
<b>Net</b>	<b>(1,576)</b>	<b>129</b>	<b>54</b>	<b>(11)</b>	<b>12</b>	<b>(1,392)</b>

Unit : Million Baht

	<b>Separate financial statements</b>			
	<b>(Charged) / credited to:</b>			
	<u>As at</u> <u>January 1,</u> <u>2020</u>	<u>Profit</u> <u>or loss</u>	<u>Other</u> <u>comprehensive</u> <u>income (loss)</u>	<u>As at</u> <u>December 31,</u> <u>2020</u>
<b>Deferred tax assets</b>				
Provisions for employee benefits	791	77	35	903
Property, plant and equipment	416	16	-	432
Lease liabilities	-	20	-	20
Tax loss carry forward	-	930	-	930
Others	22	2	(12)	12
<b>Total</b>	<b>1,229</b>	<b>1,045</b>	<b>23</b>	<b>2,297</b>
<b>Deferred tax liabilities</b>				
Property, plant and equipment	(2,719)	(398)	-	(3,117)
Others	(102)	(39)	56	(85)
<b>Total</b>	<b>(2,821)</b>	<b>(437)</b>	<b>56</b>	<b>(3,202)</b>
<b>Net</b>	<b>(1,592)</b>	<b>608</b>	<b>79</b>	<b>(905)</b>

Unit : Million Baht

	<b>Separate financial statements</b>			
	<b>(Charged) / credited to:</b>			
	<u>As at</u> <u>January 1,</u> <u>2019</u>	<u>Profit</u> <u>or loss</u>	<u>Other</u> <u>comprehensive</u> <u>income (loss)</u>	<u>As at</u> <u>December 31,</u> <u>2019</u>
<b>Deferred tax assets</b>				
Inventories	11	(8)	-	3
Provisions for employee benefits	584	207	-	791
Others	356	64	15	435
<b>Total</b>	<b>951</b>	<b>263</b>	<b>15</b>	<b>1,229</b>
<b>Deferred tax liabilities</b>				
Inventories	(244)	209	-	(35)
Property, plant and equipment	(2,432)	(287)	-	(2,719)
Finance lease assets	(5)	1	-	(4)
Others	(59)	4	(8)	(63)
<b>Total</b>	<b>(2,740)</b>	<b>(73)</b>	<b>(8)</b>	<b>(2,821)</b>
<b>Net</b>	<b>(1,789)</b>	<b>190</b>	<b>7</b>	<b>(1,592)</b>

## 20. BORROWINGS AND DEBENTURES

### 20.1 Short-term borrowings

Short-term borrowings balances as at December 31, 2020 and 2019 were as follows:

Unit : Million Baht

	<u>Note</u>	<b>Consolidated</b>			
		<b>financial statements</b>		<b>Separate</b>	
		<u>2020</u>	<u>2019</u>	<u>financial statements</u> <u>2020</u>	<u>2019</u>
Short-term borrowings from financial institutions					
- Secured		19	427	-	-
- Unsecured		-	1,594	-	-
Short-term borrowings from related parties					
- Unsecured	28	-	-	5,607	3,041
<b>Total</b>		<b>19</b>	<b>2,021</b>	<b>5,607</b>	<b>3,041</b>

## 20.2 Long-term borrowings

Long-term borrowings balances as at December 31, 2020 and 2019 were as follows:

	<u>Note</u>	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
		<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Current</b>					
Current portion of long-term borrowings from financial institutions					
- Secured		764	265	-	-
- Unsecured		1,210	7,843	-	7,078
Current portion of long-term borrowings from other parties					
- Secured		-	-	-	-
- Unsecured		45	41	-	-
<b>Total current</b>		<b>2,019</b>	<b>8,149</b>	<b>-</b>	<b>7,078</b>
<b>Non-current</b>					
Long-term borrowings from financial institutions					
- Secured		20,594	16,908	-	-
- Unsecured		40,383	9,610	32,831	2,995
Long-term borrowing from a related party					
- Unsecured	28	-	-	14,948	14,991
Long-term borrowings from other parties					
- Secured		-	-	-	-
- Unsecured		249	269	-	-
<b>Total non-current</b>		<b>61,226</b>	<b>26,787</b>	<b>47,779</b>	<b>17,986</b>
<b>Total</b>		<b>63,245</b>	<b>34,936</b>	<b>47,779</b>	<b>25,064</b>

As at December 31, 2020, the Group had unutilised credit facilities totalling Baht 14,670 million (2019: Baht 12,285 million).

Short-term borrowings as at December 31, 2020 and long-term borrowings as at December 31, 2020 and 2019 were secured on the following assets:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Cash and cash equivalents	726	60	-	-
Property, plant and equipment	14,638	15,837	-	-

In addition, the Group pledged some of the machinery and various right as collateral as reported to financial institutions. However, the pledged bank accounts can be withdrawn with the objective and conditions stipulated in loan agreements (see Note 5.1)

Short-term borrowings as at December 31, 2019 were partially secured by trade receivables as collateral.

As at December 31, 2020, the Group and the Company had long-term and revolving long-term credit facility agreements with several financial institutions totalling Baht 62,951 million and Baht 32,831 million, respectively (2019: Baht 34,626 million and Baht 10,073 million, respectively) bear different interest rates and repayment terms as specified in each agreement. The Group is required to comply with certain covenants pertaining to maintain of certain financial ratios, percentage of share held by the major shareholder and other conditions as specified in each agreement.

Details of the Group's borrowings from financial institutions as at December 31, 2020 were as follows:

<b>Currency</b>	<b>Facilities (in million)</b>	<b>Interest Rates (% p.a.)</b>	<b>Repayment Terms</b>
<b>The Company</b>			
Baht	5,000	THBFIX 6M plus margin	Principal is repayable in 2 instalments in December 2020 and June 2023.
Baht	10,000	THBFIX 6M plus margin	Principal is repayable once in June 2025.
Baht	10,000	THBFIX 6M plus margin	Principal is repayable on a semi-annual basis, in 12 instalments commencing from January 2022.
Baht	10,000	MLR minus margin	Principal is repayable on a quarterly basis, in 12 instalments commencing from December 2022.
<b>Subsidiaries</b>			
EUR	180	EURIBOR 3M plus margin	Principal is repayable on an annual basis, in 6 instalments commencing from 2021.
EUR	30	EURIBOR 3M plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from 2022.
Baht	1,200	Fixed rate	Principal is repayable on monthly basis, in 17 instalments commencing from April 2022.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from April 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from May 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 12 instalments commencing from May 2017.
Baht	8,653.87	Highest interest rate for 6 month-fixed deposit (4 Banks averaged) plus margin	Principal is repayable on a semi-annual basis, in 17 instalments commencing from September 2018.
Baht	500	Fixed rate	Principal is repayable on a quarterly basis, in 13 instalments commencing from March 2021.
Baht	500	Fixed rate	Principal is repayable on a quarterly basis, in 10 instalments commencing from June 2019.
Baht	575	BIBOR 3M plus margin	Principal is repayable on a quarterly basis, in 13 instalments commencing from September 2019.



Currency	Facilities (in million)	Interest Rates (% p.a.)	Repayment Terms
Baht	14,357	THBFIX 3M plus margin	Principal is repayable on a semi-annual basis, in 24 instalments commencing from February 2021.
Baht	6,004	THBFIX 3M plus margin	Principal is repayable on a semi-annual basis, in 20 instalments commencing from February 2021.
Baht	1,250	THBFIX 6M plus margin	Principal is repayable on a semi-annual basis, in 15 instalments commencing from April 2023.

As at December 31, 2020, the subsidiaries' long-term borrowings and debentures were guaranteed by the Company totalling Baht 20,353 million (2019: Baht 19,777 million) (see Note 36).

### 20.3 Debentures

Debentures balances as at December 31, 2020 and 2019 were as follows:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Current</b>				
Current portion of debenture				
- Unsecured	19,998	-	19,998	-
<b>Total current</b>	<b>19,998</b>	<b>-</b>	<b>19,998</b>	<b>-</b>
<b>Non-current</b>				
Debentures				
- Unsecured	65,034	70,131	50,166	55,221
<b>Total non-current</b>	<b>65,034</b>	<b>70,131</b>	<b>50,166</b>	<b>55,221</b>
<b>Total</b>	<b>85,032</b>	<b>70,131</b>	<b>70,164</b>	<b>55,221</b>

Details of the Group's debentures as at December 31, 2020 were as follows:

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (% p.a.)	Repayment Terms
<b>The Company</b>						
Unsubordinated debenture at 99.108% of the face value unsecured with a debenture holders' representative	USD	504.11	1,000	10	4.25	Interest is payable on a semi-annual basis and maturity in September 2022.
Unsubordinated debenture unsecured with a debenture holders' representative	Baht	10,000	1,000	7	4.50	Interest is payable on a semi-annual basis and maturity in August 2021.

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (% p.a.)	Repayment Terms
Unsubordinated debenture unsecured with a debenture holders' representative and debenture issuer has right to redeem the debentures prior to maturity after one year of issuance	Baht	10,000	1,000	4	3.05	Interest is payable on a semi-annual basis and maturity in August 2021.
Unsubordinated debenture unsecured with a debenture holders' representative and debenture issuer has right to redeem the debentures prior to maturity after one year of issuance	Baht	10,000	1,000	5	2.90	Interest is payable on a semi-annual basis and maturity in August 2024.
Unsubordinated debenture unsecured without a debenture holders' representative	Baht	1,500	1,000	5	2.20	Interest is payable on a semi-annual basis and maturity in September 2024.
Unsubordinated debenture unsecured without a debenture holders' representative	Baht	7,000	1,000	7	2.43	Interest is payable on a semi-annual basis and maturity in September 2026.
Unsubordinated debenture unsecured without a debenture holders' representative	Baht	1,500	1,000	10	2.75	Interest is payable on a semi-annual basis and maturity in September 2029.
Unsubordinated debenture unsecured with a debenture holders' representative	Baht	1,530	1,000	7	2.60	Interest is payable on a semi-annual basis and maturity in April 2027.
Unsubordinated debenture unsecured with a debenture holders' representative	Baht	3,310	1,000	10	2.99	Interest is payable on a semi-annual basis and maturity in April 2030.
Unsubordinated debenture unsecured with a debenture holders' representative	Baht	4,360	1,000	12	3.29	Interest is payable on a semi-annual basis and maturity in April 2032.
Unsubordinated debenture unsecured with a debenture holders' representative	Baht	5,800	1,000	15	3.50	Interest is payable on a semi-annual basis and maturity in April 2035.

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (% p.a.)	Repayment Terms
<b>Subsidiaries</b>						
Unsubordinated debenture at 100.00% of the face value unsecured with a debenture holders' representative	USD	495.89	1,000	4.2	4.25	Interest is payable on a semi-annual basis and maturity in September 2022.

The periods to maturity of interest-bearing liabilities, excluding finance lease liabilities, as at December 31, 2020 and 2019 were as follows:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
	Within one year	22,036	10,170	25,605
After one year but within five years	84,502	75,970	69,671	64,717
After five years	41,759	20,948	28,274	8,490
<b>Total</b>	<b>148,297</b>	<b>107,088</b>	<b>123,550</b>	<b>83,326</b>

## 21. LEASE LIABILITIES

The periods to maturity of lease liabilities, as at December 31, 2020 and 2019 were as follows:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
	Within one year	1,279	192	1,305
After one year but within five years	2,249	219	1,917	150
After five years	5,311	-	4,635	-
	<b>8,839</b>	<b>411</b>	<b>7,857</b>	<b>294</b>
<u>Less</u> Deferred interest expense	<u>(2,052)</u>	<u>(10)</u>	<u>(1,793)</u>	<u>(5)</u>
	<b>6,787</b>	<b>401</b>	<b>6,064</b>	<b>289</b>
Classification				
- Current portion of lease liabilities	1,057	187	1,105	141
- Lease liabilities	5,730	214	4,959	148
	<b>6,787</b>	<b>401</b>	<b>6,064</b>	<b>289</b>

## 22. TRADE PAYABLES

Trade payables as at December 31, 2020 and 2019 consisted of:

	<u>Note</u>	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
		<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
		Related parties	28	14,884	20,727
Other parties		5,230	4,752	1,076	450
<b>Total</b>		<b>20,114</b>	<b>25,479</b>	<b>14,813</b>	<b>19,920</b>

**23. OTHER PAYABLES**

Other payables as at December 31, 2020 and 2019 consisted of:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Accrued operating expenses	2,436	3,689	633	1,708
Accrued interest expenses	952	846	970	863
Other payables	4,384	5,265	3,985	5,138
Deposits and advances received	4,037	3,313	158	62
Withholding tax payable	372	460	255	327
Accrued other tax expenses	290	271	231	183
Others	34	62	5	21
<b>Total</b>	<b>12,505</b>	<b>13,906</b>	<b>6,237</b>	<b>8,302</b>

**24. PROVISIONS FOR EMPLOYEE BENEFITS**

Provisions for employee benefits as at December 31, 2020 and 2019 consisted of:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Post-employment benefits	5,604	4,860	4,036	3,553
Other long-term employee benefits	774	698	513	461
<b>Total</b>	<b>6,378</b>	<b>5,558</b>	<b>4,549</b>	<b>4,014</b>

Movement in the present value of the defined employee benefit obligations were as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
As at January 1,	5,558	4,283	4,014	3,015
<b>Include in profit or loss:</b>				
Current service costs	389	368	262	235
Interest on obligation	148	130	115	101
Past service costs	1	993	-	820
Actuarial loss	54	11	48	-
	592	1,502	425	1,156
<b>Included in other comprehensive income</b>				
Actuarial loss	410	57	251	-
Exchange differences on translating financial statement	53	(54)	-	-
	463	3	251	-
<b>Others</b>				
Benefits paid by the plan	(240)	(234)	(141)	(157)
Recorded as cost of assets under construction	5	4	-	-
	(235)	(230)	(141)	(157)
<b>As at December 31,</b>	<b>6,378</b>	<b>5,558</b>	<b>4,549</b>	<b>4,014</b>

For the years ended December 31, Recognised in profit or loss:	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Post-employment benefits	467	1,418	332	1,111
Other long-term employee benefits	125	84	93	45
<b>Total</b>	<b>592</b>	<b>1,502</b>	<b>425</b>	<b>1,156</b>

The expense is recognised in the following line items in the statement of profit or loss:

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Cost of sales	331	912	233	732
Selling and distribution and administrative expenses	261	590	192	424
<b>Total</b>	<b>592</b>	<b>1,502</b>	<b>425</b>	<b>1,156</b>

#### *Actuarial assumptions*

The principal actuarial assumptions as at December 31, 2020 and 2019 (expressed as weighted-averages) were as follows:

	<u>Consolidated</u>		Unit: %	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Discount rate	0.5 - 1.7	1.0 - 4.0	1.5	2.9
Future salary growth	2.5 - 7.0	3.0 - 7.0	6.0	7.0
Employee turnover	0.0 - 50.0	0.0 - 50.0	0.0 - 3.0	0.0 - 3.0
Retirement age	55 - 65 years	55 - 65 years	60 years	60 years

Assumptions regarding future mortality have been based on published statistics and mortality tables.

As at December 31, 2020, the weighted-average duration of the defined benefit obligation was 10 years (2019: 18 years).

#### *Sensitivity analysis*

Reasonably possible changes at the reporting date to one of the relevant actuarial assumptions, holding other assumptions constant, would have affected the defined benefit obligation by the amounts shown below:

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>Increase</u>	<u>Decrease</u>	<u>Increase</u>	<u>Decrease</u>
<b>As at December 31, 2020</b>				
Discount rate (1% movement)	(715)	820	(478)	567
Future salary growth (1% movement)	735	(628)	481	(415)
<b>As at December 31, 2019</b>				
Discount rate (1% movement)	(577)	667	(422)	498
Future salary growth (1% movement)	602	(498)	423	(367)

Although the analysis does not take account of the full distribution of cash flows expected under the plan, it does provide an approximation of the sensitivity of the assumptions shown.

The Labor Protection Act (No. 7) B.E. 2562 has been announced in the Royal Gazette on April 5, 2019, which will be effective after 30 days from the date announced in Royal Gazette. This Labor Protection Act stipulates additional legal severance pay rates for employees who have worked for an uninterrupted period of twenty years or more. Such employees are entitled to receive compensation of not less than 400 days at the employees' latest wage rate. This change is considered an amendment to post-employment benefits plan. The Group has already reflected the effect of such change by recognising past service cost as an expense in the consolidated and separate statements of profit or loss for the year ended December 31, 2019.

Provident fund contributions for their employees and recorded as expense in the statements of profit or loss for the years ended December 31, are as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Provident fund expense	657	630	515	506

## 25. SHARE CAPITAL

	<u>Par value</u> <u>per share</u> <u>(Baht)</u>	<u>Unit : Million Shares / Million Baht</u>			
		<u>2020</u>		<u>2019</u>	
		<u>Number</u>	<u>Amount</u>	<u>Number</u>	<u>Amount</u>
<i>Authorised</i>					
As at January 1, ordinary shares	10	<u>4,508.8</u>	<u>45,088.5</u>	<u>4,508.8</u>	<u>45,088.5</u>
<b>As at December 31, ordinary shares</b>	10	<b><u>4,508.8</u></b>	<b><u>45,088.5</u></b>	<b><u>4,508.8</u></b>	<b><u>45,088.5</u></b>
<i>Issued and paid-up</i>					
As at January 1, ordinary shares	10	<u>4,508.8</u>	<u>45,088.5</u>	<u>4,508.8</u>	<u>45,088.5</u>
<b>As at December 31, ordinary shares</b>	10	<b><u>4,508.8</u></b>	<b><u>45,088.5</u></b>	<b><u>4,508.8</u></b>	<b><u>45,088.5</u></b>

## 26. ADDITIONAL PAID-IN CAPITAL AND RESERVES

### *Share premium*

Section 51 of the Public Companies Act B.E. 2535 requires companies to set aside share subscription monies received in excess of the par value of the shares issued to a reserve account ("share premium"). Share premium is not available for dividend distribution.

### *Premium on treasury stock*

The premium on treasury stock represents the accumulated premium on sale of treasury stock, net of any deficits on sale or cancellation of treasury stock. The premium on treasury stock is not available for dividend distribution.

### *Difference arising from business combination under common control*

Difference on common control transactions arising within equity represents the difference of the book values of certain entities or businesses under common control under or over their cost as of the date of their acquisition. The reserve is non-distributable and will be retained until the respective businesses are sold or otherwise disposed of.

### ***Legal reserve***

Section 116 of the Public Companies Act B.E. 2535 requires that a company shall allocate not less than 5% of its annual net profit, less any accumulated losses brought forward (if any), to a reserve account (“legal reserve”), until this account reaches an amount not less than 10% of the registered authorised capital. The legal reserve is not available for dividend distribution.

### ***Treasury stock reserve***

The treasury stock reserve represents the amount appropriated from retained earnings equal to the cost of the Company’s own shares held by the Company. The treasury stock reserve is not available for dividend distribution.

### ***Other components of equity***

#### ***Exchange differences on translating financial statements***

The exchange differences on translating financial statements account within equity comprises all foreign currency differences arising from the translation of the financial statements of foreign operations, as well as from the translation of liabilities that hedge the Company’s net investment in a foreign operation.

#### ***Remeasurement of investments in financial assets measured at fair value through other comprehensive income***

Gain or loss on remeasurement of investments in financial assets measured at fair value through other comprehensive income account within equity comprises the cumulative net change in the fair value of investments in financial assets until the investments are derecognised or impaired.

#### ***Cash flow hedges***

The cash flow hedges account within equity comprises the cumulative net change in the fair value of cash flow hedges related to hedged transactions that have not yet occurred for effective portion.

#### ***Movements in reserves***

Movements in reserves are shown in the statements of changes in equity.

## **27. TREASURY STOCK**

At the Board of Directors’ Meeting held on May 27, 2019, the Board approved a share repurchase program for financial management purpose not exceeding 50 million shares, or approximately 1.1 percent of the total issued shares, with the maximum amount of Baht 3,000 million. The Company may purchase the shares through the Stock Exchange of Thailand within 6 months, during the period from June 11, 2019 to December 9, 2019. Treasury stock has to be resold after 6 months but no later than 3 years from the completion date of share repurchases.

On December 9, 2019, the Company has repurchased the shares under the program totalling 22.30 million shares, equivalent to 0.49% of issued share and paid-up capital, at a total cost of Baht 1,187.60 million with an equivalent amount had been appropriated from retained earnings to treasury stock reserve.

## **28. TRANSACTIONS WITH RELATED PARTIES**

A related party is as follows:

- An individual or an entity which has the ability, directly or indirectly, to control or joint control or exercise significant influence over the Group in making financial and operating decisions or;
- An individual or an entity which is subject to common control or common significant influence with the Group or;
- The Group has the ability, directly or indirectly, to control or joint control or exercise significant influence over an individual or an entity in making financial and operating decisions.

Relationships with significant related parties were as follows:

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
PTT Plc.	Thailand	Parent, common director and management and the Company's director as management
Global Green Chemicals Plc.	Thailand	Subsidiary, 72.29% shareholding, common director and the Company's management as director
GC Glycol Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as director
GC Polyols Co., Ltd.	Thailand	Subsidiary, 82.10% shareholding and the Company's management as director
GC Maintenance and Engineering Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as director
GC Marketing Solutions Co., Ltd.	Thailand	Subsidiary, 100% shareholding by the Group, and the Company's management as director
GC Logistics Solutions Co., Ltd.	Thailand	Subsidiary, 100% shareholding by the Group
GC Ventures Co., Ltd.	Thailand	Subsidiary, 100% shareholding
GC Treasury Center Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as director
GC Styrenics Co., Ltd.	Thailand	Subsidiary, 100% shareholding
GC Estate Co., Ltd.	Thailand	Subsidiary, 100% shareholding
GC Oxirane Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as director
Solution Creation Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as director
Thai Tank Terminal Limited	Thailand	Subsidiary, 51% shareholding
PTT Phenol Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as director
GC-M PTA Company Limited	Thailand	Subsidiary, 49% shareholding by the Company and 25% shareholding by subsidiary and the Company's management as director
NPC Safety and Environmental Service Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as director
ENVICCO Limited	Thailand	Subsidiary, 70% shareholding
PTTGC America Corporation	United States of America	Subsidiary, 100% shareholding, common director and the Company's management as director
PTTGC International Private Limited	Singapore	Subsidiary, 100% shareholding, common director and the Company's management as director



<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
GGC Biochemicals Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by subsidiary
Thai PET Resin Co., Ltd.	Thailand	Indirect subsidiary, 84.40% shareholding by subsidiaries and the Company's management as director
Thai Fatty Alcohols Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by subsidiary
PL Global Transport Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group
NPC S&E Security Guard Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group
Vencorex (Thailand) Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by indirect subsidiary
GCM Polymer Trading DMCC	United Arab Emirates	Indirect subsidiary, 100% shareholding by the Group
GC Logistics Solutions (Vietnam) Co., Ltd.	Vietnam	Indirect subsidiary, 100% shareholding by the Group
GC Marketing Solutions Myanmar Co., Ltd.	Myanmar	Indirect subsidiary, 100% shareholding by the Group
GC Marketing Solutions Vietnam Co., Ltd.	Vietnam	Indirect subsidiary, 100% shareholding by the Group
GC Ventures America Corporation	United States of America	Indirect subsidiary, 100% shareholding by the Group
PTTGC America LLC	United States of America	Indirect subsidiary, 100% shareholding by the Group, common director and the Company's management as director
PTTGC Innovation America Corporation	United States of America	Indirect subsidiary, 100% shareholding by the Group and the Company's management as director
PTTGC International (Netherlands) B.V.	Netherlands	Indirect subsidiary, 100% shareholding by the Group
GC International Corporation (Formerly PTTGC International (USA) Inc.)	United States of America	Indirect subsidiary, 100% shareholding by the Group, common director and the Company's management as director
PT GCM Marketing Solutions Indonesia	Indonesia	Indirect subsidiary, 67% shareholding by the Group
Vencorex France S.A.S.	France	Indirect subsidiary, 100% shareholding by indirect subsidiary
Vencorex Holding	France	Indirect subsidiary, 90.82% shareholding by subsidiary and the Company's management as director
PTT Asahi Chemical Co., Ltd.	Thailand	Joint venture, 50% shareholding and the Company's management as director

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
PTT MCC Biochem Co., Ltd.	Thailand	Joint venture, 50% shareholding
HMC Polymers Co., Ltd.	Thailand	Joint venture, 41.44% shareholding and the Company's management as director
GGC KTIS Bioindustrial Company Limited	Thailand	Indirect joint venture, 50% shareholding by subsidiary
Thai Ethoxylate Co., Ltd.	Thailand	Indirect joint venture, 50% shareholding by subsidiary
NatureWorks Asia Pacific Co., Ltd.	Thailand	Indirect joint venture, 50% shareholding by the Group
Emery Oleochemicals (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group and the Company's management as director
Emery Oleochemicals Marketing (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group
Emery Specialty Chemicals Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group and the Company's management as director
Emeryoleo Specialties (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group
NatureWorks LLC	United States of America	Indirect joint venture, 50% shareholding by the Group
Matrix Polymers Australia Pty Ltd.	Australia	Indirect joint venture, 49% shareholding by the Group
Matrix Polymers Ltd.	England	Indirect joint venture, 49% shareholding by the Group
Matrix Polymers New Zealand Pty Ltd.	New Zealand	Indirect joint venture, 49% shareholding by the Group
Revolve Group Limited	England	Indirect joint venture, 49% shareholding by the Group and the Company's management as director
Revolve Matrix Polymers Malaysia Sdn. Bhd.	Malaysia	Indirect joint venture, 49% shareholding by the Group
Global Power Synergy Plc.	Thailand	Associate, 22.73% shareholding, shareholding by parent company and common director
Kuraray GC Advanced Materials Company Limited	Thailand	Associate, 33.40% shareholding and the Company's management as director
PTT Energy Solutions Co., Ltd.	Thailand	Associate, 20% shareholding, shareholding by parent company and common director
PTT Digital Solutions Co., Ltd.	Thailand	Associate, 40% shareholding and shareholding by parent company

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
Vinythai Plc.	Thailand	Associate, 24.98% shareholding and the Company's management as director
Eastern Fluid Transport Co., Ltd.	Thailand	Associate, 15% shareholding by the Company and 15% shareholding by subsidiary
Combined Heat and Power Producing Co., Ltd.	Thailand	Indirect associate, 22.73% shareholding by the Group
GHECO-One Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow Energy Public Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 2 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 3 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 11 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow IPP Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Dynachisso Thai Co., Ltd.	Thailand	Indirect associate, 41.50% shareholding by subsidiary
Thai Eastern Topseeds Oil Co., Ltd.	Thailand	Indirect associate, 30% shareholding by subsidiary
Advanced Biochemical (Thailand) Co., Ltd.	Thailand	Indirect associate, 24.98% shareholding by the Group
S.P. Petpack Inter Group Co., Ltd.	Thailand	Indirect associate, 25% shareholding by the Group
PT Indo Thai Trading	Indonesia	Indirect associate, 49% shareholding by the Group until July 2019
Thai Petroleum Pipeline Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Dhipaya Insurance Plc.	Thailand	Related party, shareholding by parent company, common director
Thai Paraxylene Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Thai Oil Plc.	Thailand	Related party, shareholding by parent company
TOP Solvent Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
TOP Solvent (Vietnam) LLC.	Vietnam	Related party, indirect shareholding by parent company

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
Business Services Alliance Co., Ltd.	Thailand	Related party, shareholding by parent company, the Company and two Company's associates, each of 25% shareholding of preferred stock
PTT Natural Gas Distribution Co., Ltd.	Thailand	Related party, shareholding by parent company
PTT Retail Services Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
PTT Retail Management Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
PTT Oil and Retail Business Plc.	Thailand	Related party, shareholding by parent company
PTTEP Siam Limited	Thailand	Related party, indirect shareholding by parent company
PTTEP International Limited	Thailand	Related party, indirect shareholding by parent company
PTT Exploration and Production Plc.	Thailand	Related party, shareholding by parent company
PTT Tank Terminal Limited	Thailand	Related party, shareholding by parent company
PTT Energy Resources Co., Ltd.	Thailand	Related party, shareholding by parent company
PTT LNG Co., Ltd.	Thailand	Related party, shareholding by parent company
Rak Phasak Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
LABIX Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Sak Chaisidhi Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Sport Services Alliance Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Community Partnership Association	Thailand	The Company's management as director
Sarn Palung Social Enterprise Company Limited	Thailand	Related party, 15% shareholding and shareholding by parent company
Amata Natural Gas Distribution Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Energy Complex Co., Ltd.	Thailand	Related party, shareholding by parent company
AI and Robotics Ventures Company Limited	Thailand	Related party, indirect shareholding by parent company

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
UBE Chemicals (Asia) Plc.	Thailand	Related party, indirect shareholding by parent company
IRPC Plc.	Thailand	Related party, shareholding by parent company and common director
IRPC Polyol Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Carigali-PTTEPI Operating Company Sdn. Bhd.	Malaysia	Related party, indirect shareholding by parent company
PTTEP South Asia Limited	Cayman Islands	Related party, indirect shareholding by parent company
PTT International Trading DMCC	United Arab Emirates	Related party, indirect shareholding by parent company
PTT International Trading London Ltd.	England	Related party, shareholding by parent company and common director
PTT International Trading Pte. Ltd.	Singapore	Related party, shareholding by parent company
TPBI & Myanmar Star Co., Ltd.	Myanmar	Related party, shareholding by subsidiary

The pricing policies for particular types of transactions are explained further below:

<b>Transactions</b>	<b>Pricing policies</b>
Sale of goods	Contract price / Regional market price / World market price
Rendering of services	Contract price
Purchase of goods / raw materials / services	Contract price / Market price
Interest on loan	Average cost of fund / Contractually agreed rate
Key management personnel compensation (Meeting allowance and bonus)	The rate approved by the Board of Directors and shareholders

Significant transactions for the years ended December 31, 2020 and 2019 with related parties were as follows:

	<b>Unit : Million Baht</b>			
	<b><u>Consolidated</u></b>		<b><u>Separate</u></b>	
	<b><u>financial statements</u></b>		<b><u>financial statements</u></b>	
<b>Parent</b>	<b><u>2020</u></b>	<b><u>2019</u></b>	<b><u>2020</u></b>	<b><u>2019</u></b>
Sales of goods or rendering of services	17,738	29,047	17,630	28,886
Purchases of goods or receiving of services	176,071	237,553	175,664	236,347
Other income	519	26	518	5
Interest expense	16	-	16	-
Other expense	74	193	66	129
Expense capitalised to fixed assets	88	-	81	-

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>		<u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Subsidiaries</b>				
Sales of goods or rendering of services	-	-	83,074	99,395
Purchases of goods or receiving of services	-	-	4,124	3,661
Interest income	-	-	26	15
Dividend income	-	-	1,606	2,666
Other income	-	-	1,100	1,144
Interest expense	-	-	824	762
Other expense	-	-	1,444	1,971
Expense capitalised to fixed assets	-	-	3,382	3,164
<b>Joint ventures</b>				
Sales of goods or rendering of services	8,299	7,874	3,720	4,469
Purchases of goods or receiving of services	3,868	3,745	99	204
Interest income	66	145	64	143
Dividend income	-	-	289	828
Other income	111	96	89	80
Other expense	-	1	-	1
<b>Associates</b>				
Sales of goods or rendering of services	4,622	5,831	4,010	4,531
Purchases of goods or receiving of services	12,982	12,916	7,352	7,220
Interest income	4	163	4	163
Dividend income	3	4	1,292	871
Other income	254	242	161	150
Interest expense	2	-	1	-
Other expense	505	459	373	353
Expense capitalised to fixed assets	237	304	196	224
<b>Other related parties</b>				
Sales of goods or rendering of services	125,521	156,928	115,747	150,458
Purchases of goods or receiving of services	7,248	16,577	6,841	15,312
Net derivative gain	134	-	134	-
Other income	547	59	544	22
Interest expense	3	-	3	-
Other expense	350	435	238	335
Expense capitalised to fixed assets	20	40	23	24
<b>Key management personnel</b>				
Key management personnel compensation				
Short-term benefits	289	374	180	193
Post-employment benefits and other long-term employee benefits	5	14	4	12
<b>Total key management personnel compensation</b>	<b>294</b>	<b>388</b>	<b>184</b>	<b>205</b>

Key management personnel in term of post-employment benefits and other long-term benefits of the subsidiaries will be paid by the Company, which is recognised as part of provisions for employee benefits.

Balances as at December 31, 2020 and 2019 with related parties were as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Trade receivables - related parties</b>				
Parent	2,056	2,265	2,027	2,251
Subsidiaries	-	-	8,490	6,942
Joint ventures	1,391	838	305	374
Associates	586	378	519	318
Other related parties	7,117	13,240	6,453	12,548
<b>Total</b>	<b>11,150</b>	<b>16,721</b>	<b>17,794</b>	<b>22,433</b>

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Other receivables - related parties</b>				
Parent	168	38	168	36
Subsidiaries	-	-	225	425
Joint ventures	180	56	21	33
Associates	127	211	22	35
Other related parties	1,205	655	1,047	550
<b>Total</b>	<b>1,680</b>	<b>960</b>	<b>1,483</b>	<b>1,079</b>

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Derivatives - Current assets</b>				
Other related parties	18	-	18	-
<b>Total</b>	<b>18</b>	<b>-</b>	<b>18</b>	<b>-</b>

**Loans to related parties**

	<u>Interest rate</u>		<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>(% per annum)</u>		<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Short-term loans</b>						
Subsidiaries	1.48 - 2.19	1.80 - 3.93	-	-	2,401	429
Associate	Fixed rate	Fixed rate	-	1,123	-	1,123
<b>Total</b>			<b>-</b>	<b>1,123</b>	<b>2,401</b>	<b>1,552</b>
<b>Long-term loans</b>						
Joint ventures	LIBOR plus margin	LIBOR plus margin	714	2,275	714	2,275
<b>Total</b>			<b>714</b>	<b>2,275</b>	<b>714</b>	<b>2,275</b>

**Summary of loans to related parties**

Short-term loans	-	1,123	2,401	1,552
Long-term loans	714	2,275	714	2,275
<b>Total</b>	<b>714</b>	<b>3,398</b>	<b>3,115</b>	<b>3,827</b>

Movements during the years ended December 31, 2020 and 2019 of loans to related parties were as follows:

**Loans to related parties**

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>Short-term loans</b>				
<b>Subsidiaries</b>				
As at January 1,	-	-	429	607
Increase	-	-	1,972	-
Decrease	-	-	-	(178)
<b>As at December 31,</b>	<b>-</b>	<b>-</b>	<b>2,401</b>	<b>429</b>
<b>Joint venture</b>				
As at January 1,	-	242	-	242
Decrease	-	(225)	-	(225)
Effect of change in exchange rates	-	(17)	-	(17)
<b>As at December 31,</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Associate</b>				
As at January 1,	1,123	-	1,123	-
Increase	-	8,000	-	8,000
Decrease	(1,123)	(6,877)	(1,123)	(6,877)
<b>As at December 31,</b>	<b>-</b>	<b>1,123</b>	<b>-</b>	<b>1,123</b>
<b>Total</b>				
As at January 1,	1,123	242	1,552	849
Increase	-	8,000	1,972	8,000
Decrease	(1,123)	(7,102)	(1,123)	(7,280)
Effect of change in exchange rates	-	(17)	-	(17)
<b>As at December 31,</b>	<b>-</b>	<b>1,123</b>	<b>2,401</b>	<b>1,552</b>
<b>Long-term loans</b>				
<b>Joint ventures</b>				
As at January 1,	2,275	3,551	2,275	3,551
Increase	-	767	-	767
Decrease	(1,561)	(1,827)	(1,561)	(1,827)
Effect of change in exchange rates	-	(216)	-	(216)
<b>As at December 31,</b>	<b>714</b>	<b>2,275</b>	<b>714</b>	<b>2,275</b>
<b>Investments in subsidiaries (Note 9)</b>				
	-	-	76,486	72,551
<b>Investments in joint ventures (Note 10)</b>				
	32,537	32,444	15,373	15,373
<b>Investments in associates (Note 11)</b>				
	31,873	29,829	27,546	26,813



	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Trade payables - related parties</i>				
Parent	12,427	17,400	12,367	17,362
Subsidiaries	-	-	111	112
Joint ventures	373	386	8	11
Associates	1,408	1,386	649	691
Other related parties	676	1,555	602	1,294
<b>Total</b>	<b>14,884</b>	<b>20,727</b>	<b>13,737</b>	<b>19,470</b>

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Other payables - related parties</i>				
Parent	57	90	53	69
Subsidiaries	-	-	911	1,230
Joint ventures	2	16	1	3
Associates	158	112	115	77
Other related parties	263	215	243	196
<b>Total</b>	<b>480</b>	<b>433</b>	<b>1,323</b>	<b>1,575</b>

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Derivatives - Current liabilities</i>				
Other related parties	3	-	3	-
<b>Total</b>	<b>3</b>	<b>-</b>	<b>3</b>	<b>-</b>

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Payables to contractors - related parties</i>				
Subsidiaries	-	-	1,376	1,550
Associates	69	101	61	94
Other related parties	3	3	2	3
<b>Total</b>	<b>72</b>	<b>104</b>	<b>1,439</b>	<b>1,647</b>

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<i>Lease liabilities - related parties</i>				
Parent	356	-	343	-
Subsidiaries	-	-	881	-
Joint ventures	7	-	-	-
Associates	79	-	31	-
Other related parties	58	-	41	-
<b>Total</b>	<b>500</b>	<b>-</b>	<b>1,296</b>	<b>-</b>

***Borrowings from related parties***

	<b>Interest rate</b>		<b>Consolidated</b>		<b>Unit : Million Baht</b>		
	<b>(% per annum)</b>		<b>financial statements</b>		<b>Separate</b>		
	<b>2020</b>	<b>2019</b>	<b>2020</b>	<b>2019</b>	<b>financial statements</b>	<b>2020</b>	<b>2019</b>
<b><i>Short-term borrowings</i></b>							
Subsidiaries	1.10	1.10	-	-	5,608	3,041	
<b>Total</b>			<b>-</b>	<b>-</b>	<b>5,608</b>	<b>3,041</b>	
<b><i>Long-term borrowing</i></b>							
Subsidiary	4.68	4.68	-	-	14,948	14,991	
<b>Total</b>			<b>-</b>	<b>-</b>	<b>14,948</b>	<b>14,991</b>	

Movements during the years ended December 31, 2020 and 2019 of borrowings from related parties were as follows:

	<b>Consolidated</b>		<b>Unit : Million Baht</b>		
	<b>financial statements</b>		<b>Separate</b>		
	<b>2020</b>	<b>2019</b>	<b>financial statements</b>	<b>2020</b>	<b>2019</b>
<b><i>Short-term borrowings</i></b>					
<b>Parent</b>					
As at January 1,	-	-	-	-	-
Increase	4,000	-	4,000	-	-
Decrease	(4,000)	-	(4,000)	-	-
<b>As at December 31,</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Subsidiaries</b>					
As at January 1,	-	-	3,041	1,931	
Increase	-	-	2,588	1,580	
Decrease	-	-	(21)	(470)	
<b>As at December 31,</b>	<b>-</b>	<b>-</b>	<b>5,608</b>	<b>3,041</b>	
<b><i>Long-term borrowing</i></b>					
<b>Subsidiary</b>					
As at January 1,	-	-	14,991	16,105	
Increase	-	-	-	-	
Effect of change in exchange rate	-	-	(61)	(1,132)	
	-	-	<b>14,930</b>	<b>14,973</b>	
Amortise deferred financing cost	-	-	18	18	
<b>As at December 31,</b>	<b>-</b>	<b>-</b>	<b>14,948</b>	<b>14,991</b>	

***Significant agreements with related parties***

The Group has significant agreements with related parties as at December 31, 2020 as follows:

***Olefins Sales and Purchase Agreements***

The Company has 4 Ethylene sales and purchase agreements with a parent company and 2 related parties. Selling prices are determined based on Ethylene price in the world market. These agreements are for the periods from 7 years to 21 years, commencing from the effective date specified in each agreement. One agreement that is expired in July 2021 is automatically renewed except for advance cancellation not less than 1 year through written notice by each party. Other three agreements will expire in December 2021, May 2022 and December 2027.

The Company has 4 Propylene sales and purchase agreements with 3 related parties. Selling prices are determined based on Polypropylene plastic pellets and Propylene prices in the world market. Three agreements are for the periods from 5 years to 15 years, commencing from the effective date specified in each agreement and expiring in December 2021, December 2026 and December 2035 and another agreement is for the period 15 years, start from the plant commercial operation date.

### ***By-Product Sales and Purchase Agreements***

The Company has a Hydrogen sales and purchase agreement with 3 related parties. Selling price in the agreement is determined based on Natural Gas price for the industry. These agreements are for the periods from 9 years 9 months to 15 years, commencing from the date as specified in the agreement and expiring from March 2024 to December 2035.

The Company has a Tail Gas sales and purchase agreement with a related party. Selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in August 2021.

### ***Utilities and Other Services Agreements***

The Company has 3 Power Supply agreements with 3 related parties. Selling prices in these agreements are determined based on reference price from the Provincial Electricity Authority. These agreements are for the periods of 6 years 8 months and 15 years, commencing from the date as specified in each agreement and expiring in September 2022, June 2027 and September 2028.

The Company has 6 Utilities agreements covering electricity, steam and demineralised water with a related party. These agreements are for the periods from 12 years to 19 years 9 months, commencing from the date as specified in each agreement and expiring in December 2028.

The Company and certain related parties have many Utilities agreements for the industries covering electricity, steam, and water for industrial use with a related party. These agreements are for the periods from 15 years to 25 years, commencing from the date as specified in each agreement and expiring from December 2021 to December 2037. All agreements can be renewed for the period of 5 years with the terms and conditions agreed by both parties.

The Company has Tank Farm Storage and Service Agreement with a related party covering tank storage, utilities for product warehouse and transportation of Methanol. This agreement is for the period of 15 years, commencing from the effective date as specified in the agreement and expiring in March 2034, with the service charge as stipulated in the agreement.

### ***Feedstock and Fuel Gas Sales and Purchase Agreements***

The Company has a Natural Gas sales and purchase agreement with a parent company. The selling price is determined based on gas price as specified in the agreement. The agreement is for the period of 20 years, commencing from the date as specified in the agreement. Subsequently, the agreement is renewed for the period of 2 years 3 months and expiring in March 2021.

The Company has 2 Natural Gas sales and purchase agreements with a parent company. Selling prices are determined based on gas price as specified in each agreement and Thailand Producer Price Index as classification of products by activity (CPA). These agreements are for the periods of 10 years, commencing from the date as specified in each agreement and expiring in May 2023 and December 2029.

The Company and 2 related parties have various Natural Gas sales and purchase agreements with a parent company. Selling prices in these agreements are determined based on fuel oil prices and Thailand Producer Price Index (PPI). These agreements are for the periods from 10 years to 15 years, commencing from the date as specified in each agreement and expiring from February 2021 to December 2029.

The Company has an Ethane, Propane, LPG and NGL sales and purchase agreement with a parent company. Selling price in an agreement for Ethane is determined based on Polyethylene plastic pellets price. Selling price for Propane and LPG is determined based on Propane and Butane price in the world market and selling price for NGL is determined based on Naphtha price in the world market. The agreement is for the period of 11 years, commencing from the date as specified in the agreement and expiring in December 2030.

The Company has an Ethane Rich Gas sales and purchase agreement with a related party. The selling price is determined based on prevailing prices of Polyethylene and Polypropylene in the region. This agreement is for the period of 10 years and will expire in January 2021.

### ***Petroleum Product Offtake Agreement***

The Company has a Petroleum Product sales and purchase agreement with a parent company and a related party. For domestic sales, the product price reflects prices prevailing in Thailand for products of a similar quality that are sold in or imported to Thailand. For export sales, the product price reflects the prevailing international spot price for that product. This agreement is for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

### ***Expansion Phase Product Offtake Agreement***

The Company has an expansion phase product offtake agreement with a parent company and a related party, which a parent company and a related party agree to purchase 100% of the volume of refined petroleum products produce by reforming and upgrading complexes. As specified in the Product Offtake Agreement, at least 50% - 80% of such volume will be sold at a competitive domestic market price and the remaining sold at a competitive export market price or other mutually agreed price. The agreement is for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

### ***Long-term Crude Oil and Other Raw materials Supply Agreements***

The Company has entered into 2 supply agreements for crude oil and other raw materials with a parent company, the reference price being based on market price of crude oil and other raw materials. One agreement is for the period of 18 years, will expire in February 2024 and another agreement is for the period of 20 years, was automatically renewed and will expire in December 2021. These agreements are automatically renewed except for advance cancellation through written notice by each party.

### ***Crack Spread Swap Agreements***

The Company has entered into many crack spread swap agreements with a related party to hedge the Company's oil refinery margin. The floating amount of the basket refinery margin (calculated crack spread based on the Singapore price of refined petroleum products, which are Naphtha, Gasoline, Gasoil, Kerosene and Fuel Oil, against the price of Dubai crude oil) is swapped for a fixed amount of the basket refinery margin for a fixed quantity per month. Under the agreements, the Company shall receive or make payment for the crack spread difference according to terms and conditions stipulated in the agreements.

### ***Product Spread Swap Agreements***

The Company has entered into many petrochemical product margin spread swap agreements with a related party to hedge the Company's petrochemical margin. The floating amount of the petrochemical margin (calculated margin spread based on the key markets petrochemical products, Paraxylene, Benzene and other products against the Naphtha price) is swapped for a fixed amount of the petrochemical margin for a fixed quantity per month. Under the agreements, the Company shall receive or make payment of the product spread difference according to terms and conditions stipulated in the agreements.

### ***Crude Oil Price Hedging Agreements***

The Company has entered into many crude oil price hedging agreements to mitigate price risk with a related party. As at December 31, 2020, the Company has no oil volume under the agreements.

### ***Sales and Purchase Aromatics Product Agreements***

The Company, a parent company, related parties and various other companies have entered into many raw material and product sales and purchase agreements. The sales and purchase prices of raw material and product are based on the prices specified in the agreements. These agreements are for the periods from 1 year to 11 years 9 months, commencing from the effective date as specified in each agreement. The agreements will expire from December 2021 to December 2026. Other agreements are automatically renewed except for a cancellation through written notice by each party.

### ***Polyethylene plastic pellets Sales and Purchase Agreements***

The Company and a related party have 2 Polyethylene plastic pellets sales and purchase agreements with another related party. The Company and a related party agree to sell all Polyethylene plastic pellets to the other related party for distributing to the customers in the market. The Polyethylene pricing structure is linked to the Polyethylene product price that the related party sells to end customers, adjusted by the marketing expenses specified in the agreements. These agreements are for the period of 15 years, commencing from the effective date as specified in each agreement. One agreement will expire in December 2021 and another will expire in June 2023.

### ***Lending and Borrowing Agreements***

The Company has unsecured short-term lending agreements for the period of 3 years through Liquidity Management System (“LMS”) with 8 related parties with the credit facility of Baht 3,500 million, Baht 3,000 million, Baht 1,500 million, Baht 800 million, Baht 500 million, Baht 300 million and Baht 100 million. These loans bear interest based on market rate referenced to BIBOR O/N plus interest rate spread.

The Company has a secured long-term lending agreement for the period of 5 years with a related party with the credit facility of USD 7.90 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has an unsecured long-term lending agreement for the period of 2 years with a related party with the credit facility of USD 17 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has unsecured short-term borrowing agreements for the period of 3 years through LMS with 8 related parties with the credit facility of Baht 4,000 million, Baht 2,500 million, Baht 800 million, Baht 500 million, Baht 400 million, Baht 60 million and Baht 50 million. These loans bear interest based on market rate referenced to BIBOR O/N minus interest rate spread.

The Company has an unsecured long-term borrowing agreement for the period of 4.2 years with a related party with the credit facility of USD 495.89 million. This loan bear interest at the fixed rate.

The Company has an uncommitted and unsecured short-term Inter-Company Borrowing & Lending agreement (ICBL) for the period of 1 year with a parent company with the borrowing credit facility of Baht 10,000 million and lending credit facility of Baht 5,000 million. The agreement was expired on December 19, 2020 and has been extended for an additional period until December 19, 2021. This facility bears interest based on market rate referenced to BIBOR or LIBOR plus interest rate spread by taking into account the return on short-term investment, short-term interest rate and the credit ratings of the Company or the borrowing company.

### ***Service Agreements***

The Company has Shared Service agreements with 27 related parties for the provision of general services. All of these agreements are effective from the date as specified in the agreements and the service charges will be agreed in the fourth quarter of each year.

The Company has Management and Engineering agreement, Design, Supply, Construction and Installation agreement, Inspection of Construction, Equipment and Machinery agreement and Management and Maintenance Work agreement with a related party. These agreements are for the periods from 1 year 6 months to 5 years, commencing from the date as specified in the agreements and expiring in June 2023.

The Company has a Security Service agreement with a related party. Under which the related party agrees to provide security service to asset, employees and visitors in the location of the Company. The agreement is for the period of 2 years and will expire in December 2022.

The Company has a Safety Inspection Service agreement and an Emergency Control Center agreement with a related party. These agreements are for the period from 2 years to 3 years and will expire in December 2023 with service rate as stipulated in the agreements.

The Company has Warehouse Management agreements with a related party. The agreements are for the periods from 1 year to 21 years 3 months and expiring from December 2021 to December 2030.

The Company has a Logistics Services agreement with a related party. The agreement is for the period of 3 years and will expire in December 2023.

The Company has entered into 2 Information and Communication Technology Service agreements with a related party. Under which the related party agrees to provide Information Technology system maintenance and support services, system structure and data centre management, system supporting and advisory, including system design and development as the Company's requirements. These agreements are for the periods from 1 year to 15 years, commencing from the date as specified in the agreements and expiring in December 2021 and December 2027.

The Company has a Technical Services agreement with a related party. Under which the Company agreed to obtain certain technical advisory services. The agreement is for the period of 3 years and will expire in December 2022.

### ***Rental Agreements***

The Company has various Land Lease agreements with related parties. These agreements are for the periods from 14 years to 30 years, commencing from the date as specified in the agreements, and expiring from February 2029 to June 2040 with land lease rate and condition as specified in the agreements.

A subsidiary has Land Lease and Office Rental agreements with 6 related parties. These agreements are for the periods from 3 years to 30 years, commencing from the date as specified in the agreements and the renewal of the contract will be subject to negotiation with the counter party.

## **29. FINANCIAL INFORMATION BY SEGMENT**

The Group has significant business segments which offer different products and services, and are managed separately. For each of the business segments, the chief operating decision maker (CODM) reviews internal management reports on at least a quarterly basis. The operations in each of the Group's reportable segments have 7 reportable segments as follows;

Segment 1	Refinery
Segment 2	Aromatics
Segment 3	Olefins and Derivatives
Segment 4	Green Chemicals
Segment 5	Performance Materials and Chemicals
Segment 6	Service and Others
Segment 7	Investments in Other Joint Ventures and Associates

Performance information of each reportable segment is measured based on segment profit before finance cost, income tax, depreciation and amortisation which as included in the internal management reports that are reviewed by the Group's CODM. Management believes that using profit before finance cost, income tax, depreciation and amortisation to measure performance is the most relevant in evaluating the results of certain segments relative to other entities that operate within these industries.

Information about reporting segments for the year ended December 31, 2020

	Unit : Million Baht								
	<u>Refinery</u>	<u>Aromatics</u>	<u>Olefins and Derivatives</u>	<u>Green Chemicals</u>	<u>Performance Materials and Chemicals</u>	<u>Service and Others</u>	<u>Investments in Other Joint Ventures and Associates</u>	<u>Elimination</u>	<u>Total</u>
External revenues	136,155	34,218	106,253	16,592	34,112	1,961	-	-	329,291
Inter-segment revenues	13,938	42,777	9,534	1,610	-	6,494	-	(74,353)	-
<b>Total revenues</b>	<b>150,093</b>	<b>76,995</b>	<b>115,787</b>	<b>18,202</b>	<b>34,112</b>	<b>8,455</b>	<b>-</b>	<b>(74,353)</b>	<b>329,291</b>
Cost of sales and rendering of services	(154,007)	(74,977)	(94,066)	(16,217)	(26,256)	(6,066)	-	73,303	(298,286)
Selling, distribution and administrative expenses	(637)	(1,170)	(7,292)	(782)	(2,078)	(1,913)	-	761	(13,111)
<b>Profit (loss) before finance costs, income tax, depreciation, amortisation and others</b>	<b>(4,072)</b>	<b>1,563</b>	<b>15,065</b>	<b>1,244</b>	<b>6,019</b>	<b>1,737</b>	<b>-</b>	<b>(1,265)</b>	<b>20,291</b>
Investment income	54	30	110	19	25	3,204	-	(3,080)	362
Finance costs	(750)	(267)	(680)	(77)	(321)	(1,588)	-	172	(3,511)
Depreciation and amortisation	(2,911)	(3,336)	(10,451)	(717)	(3,133)	(329)	-	500	(20,377)
Reversal of (loss on) impairment of assets	(47)	(15)	359	(130)	(30)	(56)	-	31	112
Share of profit of investments in joint ventures and associates	-	-	36	53	-	-	3,241	(7)	3,323
Others	28	(32)	53	17	(186)	(55)	-	518	343
<b>Profit (loss) before income tax</b>	<b>(7,698)</b>	<b>(2,057)</b>	<b>4,492</b>	<b>409</b>	<b>2,374</b>	<b>2,913</b>	<b>3,241</b>	<b>(3,131)</b>	<b>543</b>
<b>Profit (loss) for reportable segment Owners of the parent</b>	<b>(7,541)</b>	<b>(1,883)</b>	<b>4,796</b>	<b>245</b>	<b>2,485</b>	<b>1,985</b>	<b>3,241</b>	<b>(3,128)</b>	<b>200</b>

**Information about reporting segments for the year ended December 31, 2019**

	Unit : Million Baht								
	<u>Refinery</u>	<u>Aromatics</u>	<u>Olefins and Derivatives</u>	<u>Green Chemicals</u>	<u>Performance Materials and Chemicals</u>	<u>Service and Others</u>	<u>Investments in Other Joint Ventures and Associates</u>	<u>Elimination</u>	<u>Total</u>
External revenues	175,036	54,653	132,338	12,017	36,769	1,997	-	-	412,810
Inter-segment revenues	17,417	54,549	10,418	1,037	-	6,455	-	(89,876)	-
<b>Total revenues</b>	<b>192,453</b>	<b>109,202</b>	<b>142,756</b>	<b>13,054</b>	<b>36,769</b>	<b>8,452</b>	<b>-</b>	<b>(89,876)</b>	<b>412,810</b>
Cost of sales and rendering of services	(187,844)	(107,204)	(117,865)	(11,795)	(31,026)	(6,289)	-	89,529	(372,494)
Selling, distribution and administrative expenses	(913)	(1,728)	(8,314)	(936)	(2,424)	(2,132)	-	1,376	(15,071)
<b>Profit before finance costs, income tax, depreciation, amortisation and others</b>	<b>4,208</b>	<b>1,042</b>	<b>17,085</b>	<b>604</b>	<b>3,533</b>	<b>1,340</b>	<b>-</b>	<b>(10)</b>	<b>27,802</b>
Interest income	115	69	362	54	63	375	-	(48)	990
Finance costs	(388)	(171)	(450)	(79)	(445)	(1,681)	-	95	(3,119)
Depreciation and amortisation	(2,784)	(3,259)	(9,692)	(519)	(2,727)	(744)	-	212	(19,513)
Reversal of expenses from raw materials derogation	-	-	-	232	-	-	-	-	232
Gain on bargain purchase	-	-	31	-	-	-	-	-	31
Dividend income	-	-	-	-	-	3,538	-	(3,527)	11
Share of profit (loss) of investments in joint ventures	-	-	(73)	60	-	-	2,639	-	2,626
Share of profit (loss) of investments in associates	-	-	(5)	(29)	-	-	1,972	(5)	1,933
Others	(173)	(84)	18	(3)	194	2,051	-	3	2,006
<b>Profit (loss) before income tax</b>	<b>978</b>	<b>(2,403)</b>	<b>7,276</b>	<b>320</b>	<b>618</b>	<b>4,879</b>	<b>4,611</b>	<b>(3,280)</b>	<b>12,999</b>
<b>Profit (loss) for reportable segment Owners of the parent</b>	<b>1,008</b>	<b>(2,381)</b>	<b>7,022</b>	<b>162</b>	<b>395</b>	<b>4,126</b>	<b>4,611</b>	<b>(3,261)</b>	<b>11,682</b>



	Unit : Million Baht								
	<u>Refinery</u>	<u>Aromatics</u>	<u>Olefins and Derivatives</u>	<u>Green Chemicals</u>	<u>Performance Materials and Chemicals</u>	<u>Service and Others</u>	<u>Investments in Other Joint Ventures and Associates</u>	<u>Elimination</u>	<u>Total</u>
<b>As at December 31, 2020</b>									
Segment assets	66,100	71,592	186,823	13,671	76,391	95,398	62,213	(82,805)	489,383
Investment in joint ventures and associates	-	-	574	1,623	-	-	62,213	-	64,410
Change in non-current assets (excluding deferred tax assets and derivatives)	(1,625)	(2,066)	7,269	1,044	7,394	5,007	1,309	(7,001)	11,331
<b>As at December 31, 2019</b>									
Segment assets	64,704	69,264	162,080	13,289	60,473	94,124	60,904	(72,324)	452,514
Investment in joint ventures and associates	-	-	244	1,125	-	-	60,904	-	62,273
Change in non-current assets (excluding deferred tax assets and derivatives)	1,293	(494)	6,057	(36)	6,142	(1,966)	15,534	(3,235)	23,295

**Geographical segments**

In presenting information on the basis of geographical segments, segment revenue from sale of goods and rendering of services for the years ended December 31, 2020 and 2019 are based on the geographical location of customers. Segment non-current assets (exclude derivatives and deferred tax assets) as at December 31, 2020 and 2019 are based on the geographical location of the assets.

**Geographical information**

	<b>Unit: Million Baht</b>	
	<b>Revenues</b>	
	<b><u>2020</u></b>	<b><u>2019</u></b>
Thailand	209,335	260,869
The People's Republic of China	36,270	42,994
Singapore	8,480	20,021
Vietnam	15,094	17,278
Malaysia	9,858	13,517
Indonesia	6,294	6,052
India	4,196	5,108
Japan	3,344	4,481
United States of America	2,392	2,786
Other countries	34,028	39,704
<b>Total</b>	<b><u>329,291</u></b>	<b><u>412,810</u></b>

	<b>Unit: Million Baht</b>	
	<b>Non-current assets (excluding deferred tax assets and derivatives)</b>	
	<b><u>2020</u></b>	<b><u>2019</u></b>
Thailand	334,914	324,881
United States of America	11,274	10,242
France	7,238	6,900
Malaysia	4,406	4,505
Other countries	446	419
<b>Total</b>	<b><u>358,278</u></b>	<b><u>346,947</u></b>

**Major customers**

The Group's revenue from sale of goods and rendering of services for the years ended December 31, 2020 and 2019 mainly comprise revenue from one customer, which is the related party, of Refinery, Aromatics and Olefins and derivatives segment representing Baht 17,738 million (2019: Baht 29,047 million) and revenue from another customer, which is the related party, of Refinery and Green Chemicals segment representing Baht 99,346 million (2019: Baht 123,025 million).

### 30. EXPENSES BY NATURE

The statements of income include an analysis of expenses by function. Expenses by nature disclosed in accordance with the requirements of various TFRS were as follows:

	<b>Consolidated</b>		<b>Unit : Million Baht</b>	
	<b>financial statements</b>		<b>Separate</b>	
	<b>2020</b>	<b>2019</b>	<b>2020</b>	<b>2019</b>
<b><i>Included in cost of sales of goods</i></b>				
Changes in finished goods and work in progress	2,646	1,677	1,922	1,443
Raw materials used	246,588	324,740	182,412	254,546
Personnel expense	9,246	10,397	4,921	5,956
Depreciation of property, plant and equipment	17,567	17,352	12,225	12,258
Depreciation of right-of-use assets	620	-	486	-
Amortisation of intangible assets	364	393	288	280
<b><i>Included in selling and distribution and administrative expenses</i></b>				
Personnel expense	5,484	6,448	3,566	4,401
Depreciation of property, plant and equipment	692	839	437	537
Depreciation of right-of-use assets	513	-	610	-
Amortisation of intangible assets	382	372	259	235
Minimum lease payments recognised as an operating lease expense	307	667	119	317

### 31. FINANCE COSTS

Finance costs for the years ended December 31, 2020 and 2019 consisted of:

	<b>Consolidated</b>		<b>Unit : Million Baht</b>	
	<b>financial statements</b>		<b>Separate</b>	
	<b>2020</b>	<b>2019</b>	<b>2020</b>	<b>2019</b>
<b><i>Interest expense</i></b>				
Parent	2	-	2	-
Subsidiaries	-	-	782	762
Debentures	2,984	2,300	2,325	1,646
Derivatives	2	-	2	-
Bank loans and overdrafts	1,043	1,208	291	354
Borrowings from other parties	7	15	-	-
Interest expense on lease liabilities	176	8	160	5
<b>Total interest expense</b>	<b>4,214</b>	<b>3,531</b>	<b>3,562</b>	<b>2,767</b>
Other finance costs	250	323	173	181
<u>Less</u> Capitalised as cost of assets under construction	(953)	(735)	(459)	(329)
<b>Net</b>	<b>3,511</b>	<b>3,119</b>	<b>3,276</b>	<b>2,619</b>

### 32. PROMOTIONAL PRIVILEGES

By virtue of the provisions of the Industrial Investment Promotion Act of B.E. 2520, the Company has been granted privileges by the Board of Investment relating to production of upstream, intermediate and downstream petrochemical, utilities and production support facilities, jetty for transportation and storage of liquid product and transportation by marine vessels, production of petroleum product, research and development of polymer products and chemical formula, lab testing services and refinery. The privileges granted include:

- (a) exemption from payment of import duty on machinery approved by the Board;
- (b) exemption from payment of income tax not over 100 percent of investment excluded land and working capital of certain operations for a period of 8 years from the date on which the income is first derived from such operations;
- (c) a 50% reduction in the normal income tax rate on the net profit derived from certain operations for a period of five years, commencing from the expiry date in (b) above.

As promoted companies, the Company must comply with certain terms and conditions prescribed in the promotional certificates.

Summary of revenues from promoted and non-promoted businesses in separate financial statement for the years ended December 31, 2020 and 2019 were as follows:

Unit : Million Baht						
<u>Separate financial statements</u>						
2020			2019			
Promoted businesses	Non- promoted businesses	Total	Promoted businesses	Non- promoted businesses	Total	
Export sales	20,443	5,331	25,774	2,027	28,176	30,203
Domestic sales	117,619	126,178	243,797	22,397	298,356	320,753
Services income	-	662	662	-	591	591
<b>Total revenues</b>	<b>138,062</b>	<b>132,171</b>	<b>270,233</b>	<b>24,424</b>	<b>327,123</b>	<b>351,547</b>

Certain subsidiaries in the Group have been granted promotional privileges as same as the Company.

### 33. BASIC EARNINGS (LOSS) PER SHARE

The calculation of basic earnings (loss) per share for the years ended December 31, 2020 and 2019 were based on the profit (loss) for the years attributable to ordinary shareholders of the parent company and the weighted average number of ordinary shares outstanding during the years as follows:

Unit : Million Baht / Million shares				
	<u>Consolidated</u>		<u>Separate</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
Profit (Loss) attributable to ordinary shareholders of the parent company (basic)	199.61	11,682.08	(3,379.55)	9,153.08
Number of ordinary shares as at January 1,	4,508.85	4,508.85	4,508.85	4,508.85
Effect of treasury stock	(22.30)	(2.59)	(22.30)	(2.59)
Weighted average number of ordinary shares (basic)	4,486.55	4,506.26	4,486.55	4,506.26
<b>Earnings (loss) per share (basic) (in Baht)</b>	<b>0.04</b>	<b>2.59</b>	<b>(0.75)</b>	<b>2.03</b>

### 34. DIVIDENDS PAID

At the Annual General Meeting of the shareholders of the Company held on June 2, 2020, the shareholders acknowledged the appropriation of annual dividend from 2019 performance at Baht 2.00 per share, amounting to Baht 8,995 million. The Company had paid interim dividend of the first half year of 2019 at Baht 1.00 per share, amounting to Baht 4,508 million on September 13, 2019 and the payment of an interim dividend at Baht 1.00 per share, amounting to Baht 4,487 million by the Board of Directors at the Extraordinary Meeting No. 2/2020, held on April 1, 2020. Such dividend was paid to the shareholders on April 28, 2020.

At the Annual General Meeting of the shareholders of the Company held on April 5, 2019, the shareholders approved the appropriation of annual dividend from 2018 performance at Baht 4.25 per share, amounting to Baht 19,163 million. The Company had paid interim dividend of the first half year of 2018 at Baht 1.75 per share, amounting to Baht 7,890 million on September 18, 2018. The remaining dividend was paid for the second half year of 2018 at Baht 2.50 per share, amounting to Baht 11,272 million. Such dividend was paid to the shareholders in April 2019.

At the Board of Directors' Meeting of the Company held on August 19, 2019, the Board approved the appropriation of interim dividends from the earnings from January 1, 2019 to June 30, 2019 at Baht 1.00 per share. The dividend amounting to Baht 4,508 million was paid to the rightful shareholders in September 2019.

### 35. FINANCIAL INSTRUMENTS

#### *Financial risk management policies*

The Group is exposed to normal business risks from changes in market interest rates, currency exchange rates and commodity prices and from non-performance of contractual obligations by counterparties. The Group does not hold or issue derivative financial instruments for speculative or trading purposes.

Risk management is integral to the whole business of the Group. The management continually monitors the Group's risk management process to ensure that an appropriate balance between risk and control is achieved.

#### *Capital management*

The Company's Board of Directors' policy is to maintain a strong capital base so as to maintain investor, creditor, partners and other stakeholders. In addition, the Board monitors the return on capital and the level of dividends to ensure business sustainability.

#### *Interest rate risk*

Interest rate risk is the risk that future movements in market interest rates will affect the results of the Group's operations and its cash flows because the Group's finances loans which have both floating and fixed interest rates for their operations. The Group has managed this risk to ensure the appropriateness to the business operation.

The effective interest rates of interest-bearing liabilities as at December 31, 2020 and 2019 and the periods in which those liabilities mature or re-price were disclosed in note 20 to the financial statement.

**Interest rate sensitivity analysis**

The sensitivity analyses below have been determined based on the exposure to interest rates for financial liabilities at the reporting date. For floating rate liabilities, the analysis is prepared assuming the amount of liability outstanding at the reporting date was outstanding for the whole year and using an increase or decrease rate by considering the reasonably possible change in interest rates.

	Unit : Million Baht			
	<u>Consolidated</u> <u>financial statements</u>		<u>Separate</u> <u>financial statements</u>	
	Increase	Decrease	Increase	Decrease
<b>As at December 31, 2020</b>				
<b>Interest rates change by 1%</b>				
Finance costs	625	(237)	330	(162)

**Foreign currency risk**

The Group is exposed to foreign currency risk. Therefore, the Group primarily utilises forward exchange contracts to hedge such financial assets and liabilities denominated in foreign currencies.

As at December 31, 2020 and 2019, the Group was exposed to foreign currency risk in respect of financial assets and liabilities denominated in the following currencies:

	Unit : Million Baht			
	<u>Consolidated</u> <u>financial statements</u>		<u>Separate</u> <u>financial statements</u>	
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b>USD</b>				
Financial assets	23,242	16,536	18,769	12,680
Financial liabilities	(19,846)	(21,295)	(33,503)	(34,681)
<b>Gross statement of financial position exposure</b>	<b>3,396</b>	<b>(4,759)</b>	<b>(14,734)</b>	<b>(22,001)</b>
<b>Net foreign currency exchange contracts</b>	<b>148</b>	<b>4,199</b>	<b>(634)</b>	<b>3,122</b>

**Foreign currency sensitivity analysis**

The following table details the Group's sensitivity to an increase and decrease in THB currency against USD currency. The sensitivity analysis includes only outstanding foreign currency denominated monetary items and foreign exchange forward contracts applied cash flow hedges accounting for USD currency at the reporting date and using an increase or decrease rate by considering the reasonably possible change in foreign exchange rates.

	Unit : Million Baht			
	<u>Consolidated</u> <u>financial statements</u>		<u>Separate</u> <u>financial statements</u>	
	Strengthens	Weakens	Strengthens	Weakens
<b>As at December 31, 2020</b>				
<b>Exchange rate change by 10%</b>				
Net gain (loss) on foreign exchange rate	(237)	228	1,619	(1,619)
Other equity - gain (loss) on cash flow hedges	(117)	117	(83)	83

The Group performs foreign currency risk management on assets and liabilities held in USD. The Group has net assets and liabilities under USD currency. The Group manages net USD assets and liabilities by naturally hedged USD portion of net profit to minimise the impact from fluctuations in foreign currency to the Group's performance.

In addition to forward exchange contracts, the Group uses derivatives financial instruments, principally interest rate swap, to manage exposure to fluctuations in interest rates. As at December 31, 2020, the Group has no interest rate swap contract. (2019: Baht 0.48 million) to repay certain interest bearing liabilities in foreign currencies.

The following tables detail the foreign currency forward contracts outstanding at the reporting date for their hedged items related to forecasted purchases. Foreign currency forward contract assets and liabilities are presented in the line "Derivatives" (either as asset or as liabilities) within the statement of financial position.

<u>Hedging instruments</u> - Outstanding contracts	<u>Consolidated financial statements</u>			Carrying amount of the hedging instruments assets (liabilities) Million Baht
	Average exchange rate  [rate]	Notional value: Foreign currency  Million [FC]	Notional value: Local currency  Million Baht	
<b>As at December 31, 2020</b>				
<b>Cash flow hedges</b>				
<i>Buy [USD]</i>	30.45	39	1,187	(16)
<i>Buy [EUR]</i>	35.54	13	472	19
<i>Buy [SEK]</i>	3.46	72	249	15

<u>Hedging instruments</u> - Outstanding contracts	<u>Separate financial statements</u>			Carrying amount of the hedging instruments assets (liabilities) Million Baht
	Average exchange rate  [rate]	Notional value: Foreign currency  Million [FC]	Notional value: Local currency  Million Baht	
<b>As at December 31, 2020</b>				
<b>Cash flow hedges</b>				
<i>Buy [USD]</i>	30.65	27	843	(17)
<i>Buy [SEK]</i>	3.46	72	249	15

The Group assesses effectiveness by comparing the nominal amount of the net assets designated in the hedge relationship with the nominal amount of the hedging instruments. This is a simplified approach because the currency of the exposure and hedging instruments perfectly match and the company identified that there was no change in fair value for hedge ineffectiveness recognized in the income statement.

#### ***Commodity price risk***

The Group is exposed to commodity price risk relating to purchases and sales. The Group mitigates risk by closely monitoring market situation, feedstock, and product prices to adjust sales and production plans for our value chain facing rapidly changing situations. Moreover, the Group primarily utilises derivatives and forward to hedge the commodity price and spread fluctuations.

**Commodity price sensitivity analysis**

The following table details the Group's sensitivity to an increase and decrease in commodity price. The sensitivity analysis includes only outstanding commodity derivative contracts at the reporting date and using an increase or decrease rate by considering the reasonably possible change in commodity price.

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>		<u>financial statements</u>	
	Increase	Decrease	Increase	Decrease
<b>As at December 31, 2020</b>				
<b>Net derivatives gain (loss)</b>				
Petroleum Crack Spread				
hedging +/- 1 USD per BBL	(96)	96	(96)	96
Petrochemical Spread hedging				
+/- 1 USD per Ton	(0.4)	0.4	(0.4)	0.4

**Credit risk**

Credit risk is risk of failure from a customer or a counterparty to settle its obligations to the Group as and when they fall due.

Management has a policy in place and the exposure to credit risk is monitored on an ongoing basis. Credit evaluations are performed on all customers requiring credit over a certain amount. At the reporting date, there were no significant credit risk and the concentration of credit risk. The maximum exposure to credit risk is represented by the carrying amount of each financial asset in the statement of financial position. However, the majority of the customers are on the long-term contracted commitment and parts of them are the Company's shareholders which the company has consistently collected from them. For the customers who do not have the long-term contracted commitments, the Group monitors the risk on an ongoing basis and would do the business only with the credible customers by limiting the credit lines and requesting the guarantee on some cases. For the export, the credit of counterparty will be considered. The Group will demand a payment on a case to case basis and also has commercial credit insurance. Management anticipates no material losses from its debt collection.

- For trade receivables, the Group apply simplified approach in accordance with TFRS 9 to measure lifetime expected credit loss. The Group consider expected credit loss by using trade receivables provision table which estimate historical credit loss. The overdue circumstance adjusted to reflect current situation of receivables and the future economic conditions were taken into account. Therefore, credit risk of these financial assets is presented by consideration of overdue status in provision by aging table set out in note 6.
- The Company has loans to related parties. In assessing credit risk, the Company considers that there is high probability that payments will be made under the agreements. However, the Company continually monitors the possibility of payments from counterparties.
- The Group has deposits and investments in financial assets with financial institutions and companies which are rated at investment grade. The Group constantly assesses the financial status and stability of those financial institutions and companies to manage risks from deposit and investing.



**Liquidity risk**

The Group monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Group's operations and to mitigate the effects of fluctuations in cash flows.

The following tables detail the Group's remaining contractual maturity for its non-derivative financial liabilities with agreed repayment periods. The tables have been drawn up based on the undiscounted cash flows of financial liabilities based on the earliest date on which the Group can be required to pay.

	<b>Unit : Million Baht</b>				
	<b>Consolidated financial statements</b>				
	<b>Less than 1 year</b>	<b>1 - 2 years</b>	<b>2 - 5 years</b>	<b>Over 5 years</b>	<b>Total</b>
<b>As at December 31, 2020</b>					
Short-term borrowings from financial institutions	19	-	-	-	19
Trade payables	20,114	-	-	-	20,114
Other payables	7,806	-	-	-	7,806
Payables to contractors	2,956	-	-	-	2,956
Lease liabilities	1,278	823	1,426	5,311	8,838
Long-term borrowings from financial institutions	2,008	4,853	38,206	18,232	63,299
Long-term borrowings from other parties	45	45	120	85	295
Debentures	20,000	30,534	11,500	23,500	85,534
Other non-current liabilities	-	126	196	23	345

	<b>Unit : Million Baht</b>				
	<b>Separate financial statements</b>				
	<b>Less than 1 year</b>	<b>1 - 2 years</b>	<b>2 - 5 years</b>	<b>Over 5 years</b>	<b>Total</b>
<b>As at December 31, 2020</b>					
Trade payables	14,813	-	-	-	14,813
Other payables	5,593	-	-	-	5,593
Payables to contractors	2,020	-	-	-	2,020
Lease liabilities	1,305	829	1,088	4,635	7,857
Short-term borrowings from related parties	5,608	-	-	-	5,608
Long-term borrowings from financial institutions	-	1,025	27,175	4,800	33,000
Long-term borrowings from a related party	-	16,473	-	-	16,473
Debentures	20,000	15,638	11,500	23,500	70,638
Other non-current liabilities	-	124	196	23	343

The following table details the Group's liquidity analysis for its derivative financial instruments based on contractual maturities. The table has been drawn up based on the undiscounted net cash inflows and outflows on derivative instruments.

	<b>Unit : Million Baht</b>				
	<b><u>Consolidated financial statements</u></b>				
	<b>Less than 1 year</b>	<b>1 - 2 years</b>	<b>2 - 5 years</b>	<b>Over 5 years</b>	<b>Total</b>
<b>As at December 31, 2020</b>					
<b>Cash inflows from</b>					
Foreign exchange forward contracts	8,357	-	-	-	8,357
Commodity forward contracts	57	-	-	-	57
<b>Cash outflows from</b>					
Foreign exchange forward contracts	(8,351)	-	-	-	(8,351)
Commodity forward contracts	(40)	-	-	-	(40)

	<b>Unit : Million Baht</b>				
	<b><u>Separate financial statements</u></b>				
	<b>Less than 1 year</b>	<b>1 - 2 years</b>	<b>2 - 5 years</b>	<b>Over 5 years</b>	<b>Total</b>
<b>As at December 31, 2020</b>					
<b>Cash inflows from</b>					
Foreign exchange forward contracts	6,639	-	-	-	6,639
Commodity forward contracts	57	-	-	-	57
<b>Cash outflows from</b>					
Foreign exchange forward contracts	(6,649)	-	-	-	(6,649)
Commodity forward contracts	(40)	-	-	-	(40)

***Levels and categories of financial instruments and their fair values***

The following table details information as at December 31, 2020 of:

- classes of financial instruments based on their nature and characteristics;
- the carrying amounts of financial instruments;
- fair values of financial instruments (except fair values of financial instruments when carrying amount approximates their fair value); and
- fair value hierarchy levels of financial assets and financial liabilities for which fair value was disclosed.

The carrying values of cash and cash equivalents, current investments in financial assets, trade receivables, other receivables, short-term loans to related parties, short-term borrowings from financial institutions, trade payables, other payables, payables to contractors and short-term borrowings from related parties that measured at amortised cost approximate their fair values due to the short maturity period.

The carrying values of long-term loans to related parties, other non-current assets, long-term borrowings from financial institutions with floating interest rate, long-term borrowings from other party, lease liabilities and other non-current liability that measured at amortised cost approximate their fair values.

Unit : Million Baht

	<u>Consolidated financial statements</u>									<u>Fair value</u>				
	<u>Carrying value</u>					<u>Financial liabilities</u>			<u>Non-financial assets and non-financial liabilities</u>	<u>Total</u>	<u>Level</u>			<u>Total</u>
	<u>Financial assets</u>					<u>FVTPL - mandatorily measured</u>	<u>Amortised cost</u>				<u>1</u>	<u>2</u>	<u>3</u>	
<u>FVTOCI - Derivatives designated in cash flow hedge relationships</u>	<u>FVTPL - mandatorily measured</u>	<u>FVTOCI - mandatorily measured</u>	<u>FVTOCI - designated</u>	<u>Amortised cost</u>	<u>FVTOCI - Derivatives designated in cash flow hedge relationships</u>	<u>FVTPL - mandatorily measured</u>	<u>Amortised cost</u>							
<b>As at December 31, 2020</b>														
Cash and cash equivalents	-	-	1	-	44,312	-	-	-	-	44,313	-	1	-	1
Current investments in financial assets	-	-	70	-	16,275	-	-	-	-	16,345	-	70	-	70
Trade receivables	-	-	-	-	29,277	-	-	-	-	29,277	-	-	-	-
Other receivables	-	-	-	-	1,744	-	-	-	1,982	3,726	-	-	-	-
Current derivatives assets	37	89	-	-	-	-	-	-	-	126	-	126	-	126
Non-current investments in financial assets	-	382	36	670	-	-	-	-	-	1,088	352	36	700	1,088
Long-term loans to related parties	-	-	-	-	714	-	-	-	-	714	-	-	-	-
Other non-current assets	-	-	-	-	247	-	-	-	558	805	-	-	-	-
Short-term borrowings from financial institutions	-	-	-	-	-	-	19	-	-	19	-	-	-	-
Trade payables	-	-	-	-	-	-	20,114	-	-	20,114	-	-	-	-
Other payables	-	-	-	-	-	-	7,806	4,699	-	12,505	-	-	-	-
Payables to contractors	-	-	-	-	-	-	2,956	-	-	2,956	-	-	-	-
Current derivatives liabilities	-	-	-	-	-	20	81	-	-	101	-	101	-	101
Long-term borrowings from financial institutions	-	-	-	-	-	-	62,951	-	-	62,951	-	818 *	-	818
Long-term borrowings from other parties	-	-	-	-	-	-	294	-	-	294	-	-	-	-
Debentures	-	-	-	-	-	-	85,032	-	-	85,032	-	87,942	-	87,942
Lease liabilities	-	-	-	-	-	-	6,787	-	-	6,787	-	-	-	-
Non-current derivatives liabilities	-	-	-	-	-	-	95	-	-	95	-	-	95	95
Other non-current liabilities	-	-	-	-	-	-	345	138	-	483	-	-	-	-

\* Fair value of long-term borrowings from financial institutions with fixed interest rate only.

Unit : Million Baht

	<u>Separated financial statements</u>													
	Carrying value									Fair value				
	Financial assets					Financial liabilities			Non-	Total	Level			Total
FVTOCI - Derivatives designated in cash flow hedge relationships	FVTPL - mandatorily measured	FVTOCI - mandatorily measured	FVTOCI - designated	Amortised cost	FVTOCI - Derivatives designated in cash flow hedge relationships	FVTPL - mandatorily measured	Amortised cost	financial assets and non- financial liabilities	1		2	3		
<b>As at December 31, 2020</b>														
Cash and cash equivalents	-	-	1	-	31,534	-	-	-	-	31,535	-	1	-	1
Current investments in financial assets	-	-	70	-	15,875	-	-	-	-	15,945	-	70	-	70
Trade receivables	-	-	-	-	22,592	-	-	-	-	22,592	-	-	-	-
Other receivables	-	-	-	-	1,004	-	-	-	1,009	2,013	-	-	-	-
Short-term loans to related parties	-	-	-	-	2,401	-	-	-	-	2,401	-	-	-	-
Current derivatives assets	15	88	-	-	-	-	-	-	-	103	-	103	-	103
Non-current investments in financial assets	-	352	36	4	-	-	-	-	-	392	352	36	4	392
Long-term loans to related parties	-	-	-	-	714	-	-	-	-	714	-	-	-	-
Other non-current assets	-	-	-	-	218	-	-	-	19	237	-	-	-	-
Trade payables	-	-	-	-	-	-	-	14,813	-	14,813	-	-	-	-
Other payables	-	-	-	-	-	-	-	5,593	644	6,237	-	-	-	-
Payables to contractors	-	-	-	-	-	-	-	2,020	-	2,020	-	-	-	-
Short-term borrowings from related parties	-	-	-	-	-	-	-	5,608	-	5,608	-	-	-	-
Current derivatives liabilities	-	-	-	-	-	18	81	-	-	99	-	99	-	99
Long-term borrowings from financial institutions	-	-	-	-	-	-	-	32,831	-	32,831	-	-	-	-
Long-term borrowings from a related party	-	-	-	-	-	-	-	14,948	-	14,948	-	15,808	-	15,808
Debentures	-	-	-	-	-	-	-	70,164	-	70,164	-	72,329	-	72,329
Lease liabilities	-	-	-	-	-	-	-	6,064	-	6,064	-	-	-	-
Other non-current liabilities	-	-	-	-	-	-	-	344	53	397	-	-	-	-

The following table details information as at December 31, 2019 of:

- the carrying amounts of financial instruments;
- fair values of financial instruments (except fair values of financial instruments when carrying amount approximates their fair value); and
- fair value hierarchy levels of financial assets and financial liabilities for which fair value was disclosed.

**Unit : Million Baht**

	<b>Consolidated financial statements</b>						
	<b>Carrying value</b>			<b>Fair value</b>			
	<b>Current</b>	<b>Non-current</b>	<b>Total</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Total</b>
<b>As at December 31, 2019</b>							
<b>Financial assets</b>							
Debt securities							
available-for-sale	545	1,503	2,048	-	2,048	-	2,048
Equity securities							
available-for-sale	-	384	384	384	-	-	384
Financial derivatives	28	-	28	-	28	-	28
Commodity derivatives	194	-	194	-	194	-	194
<b>Financial liabilities</b>							
Debentures	-	70,131	70,131	-	72,477	-	72,477
Financial derivatives	320	12	332	-	332	-	332
Commodity derivatives	466	-	466	-	466	-	466

**Unit : Million Baht**

	<b>Separate financial statements</b>						
	<b>Carrying value</b>			<b>Fair value</b>			
	<b>Current</b>	<b>Non-current</b>	<b>Total</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Total</b>
<b>As at December 31, 2019</b>							
<b>Financial assets</b>							
Debt securities							
available-for-sale	545	1,503	2,048	-	2,048	-	2,048
Equity securities							
available-for-sale	-	384	384	384	-	-	384
Financial derivatives	14	-	14	-	14	-	14
Commodity derivatives	194	-	194	-	194	-	194
<b>Financial liabilities</b>							
Long-term borrowing from a related party	-	14,991	14,991	-	15,808	-	15,808
Debentures	-	55,221	55,221	-	56,761	-	56,761
Financial derivatives	69	12	81	-	81	-	81
Commodity derivatives	466	-	466	-	466	-	466

**Measurement of fair values**

Level 1 of fair values for debt instruments measured at fair value through profit or loss and equity securities available-for-sale investments are based on quoted bid price as at the end of reporting period by references from the Stock Exchange of Thailand.

Level 2 of fair values for debt instruments measured at fair value through other comprehensive income and debt securities available-for-sale investments are based on the yield rate quoted by the Thai Bond Market Association or other markets and for simple over-the-counter financial derivative and commodity derivative instruments are based on broker quotes. Those quotes are tested for reasonableness by discounting expected future cash flows using market interest rate for a similar instrument at the measurement date. Fair values reflect the credit risk of the instrument and include adjustments to take account of the credit risk of the Group and counterparty when appropriate. For fixed-rate long-term borrowings are based on discounted future cash flows for the remaining periods using market interest rate for a similar instrument at the measurement date. For debentures are based on the last bid price on the Thai Bond Market Association at the measurement date.

Level 3 of fair value for debt instrument measured at fair value through profit or loss, which is an investment in a startup company, is based on valuation of the latest fundraising round.

Fair values for equity instruments measured at fair value through other comprehensive income are as follows;

- For investments in startup companies, the fair values are based on valuation of the latest fundraising round.
- For investments in non-marketable securities, the fair values are based on cost which considered as estimated fair values, except there are significant changes in their operations.
- For investments in funds, the fair values are referred to the net asset value of the funds.

Fair values for derivative liability, which is the put option over non-controlling interest, is based on present value of expected payments which is determined by considering the forecast earnings before financial costs, income taxes, depreciation and amortisation and discounted using discount rate.

**Reconciliation of Level 3 fair value measurements of financial instruments**

The following table includes the financial assets and the financial liability that are measured subsequently at fair value on Level 3.

	<u>Consolidated</u> <u>financial statements</u>	<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>
<b>Investments in financial assets in equity instruments</b>		
<b>Balance as at January 1, 2020</b>	574	4
Effect from first-time adoption of new accounting policy	(4)	-
Total gains or (losses):		
in profit or loss	-	-
in other comprehensive income	(10)	-
Purchases/ issues	123	-
Disposals/ settlements	-	-
Effect of change in foreign exchange rates	17	-
<b>Balance as at December 31, 2020</b>	<b>700</b>	<b>4</b>
<b>Derivative liability in put option over non-controlling interest</b>		
<b>Balance as at January 1, 2020</b>	-	-
Effect from first-time adoption of new accounting policy	573	-
Total (gains) or losses:		
in profit or loss	(514)	-
in other comprehensive income	-	-
Purchases/ issues	-	-
Disposals/ settlements	-	-
Effect of change in foreign exchange rates	36	-
<b>Balance as at December 31, 2020</b>	<b>95</b>	<b>-</b>

**36. COMMITMENTS WITH NON-RELATED PARTIES**

As at December 31, 2020 and 2019, the Company and its subsidiaries had commitments with non-related parties as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>	<u>financial statements</u>	<u>Separate</u>	<u>financial statements</u>
	<u>2020</u>	<u>2019</u>	<u>2020</u>	<u>2019</u>
<b><i>Capital commitments</i></b>				
<b><i>contracted but not provided for</i></b>				
Land	-	5	-	2
Plant, machinery and equipment	6,387	13,475	3,624	9,084
Buildings and furniture, fixtures and equipment	116	107	111	98
Others	141	627	136	228
<b>Total</b>	<b><u>6,644</u></b>	<b><u>14,214</u></b>	<b><u>3,871</u></b>	<b><u>9,412</u></b>
<b><i>Non-cancellable operating lease commitments</i></b>				
Within one year	40	602	35	286
After one year but within five years	56	1,467	52	795
After five years	-	2,459	-	1,957
<b>Total</b>	<b><u>96</u></b>	<b><u>4,528</u></b>	<b><u>87</u></b>	<b><u>3,038</u></b>
<b><i>Other commitments</i></b>				
Letters of credits	327	333	100	-
Bank guarantees	3,609	3,336	1,944	1,467
Guarantees to subsidiaries and joint ventures for credit facilities, debentures and bank guarantees	631	754	21,284	20,802
Other agreements	10,094	8,699	7,805	7,214
<b>Total</b>	<b><u>14,661</u></b>	<b><u>13,122</u></b>	<b><u>31,133</u></b>	<b><u>29,483</u></b>

Under the Equity Contribution and Shareholders Support Agreement between the Company, two subsidiaries and lenders, the Company will provide financial support in case of occurrence of cost overrun during the construction period to both subsidiaries according to their shareholding interests not exceeding Baht 1,448.77 million. In addition, the Company will provide financial support in case of occurrence of cash deficiency to a subsidiary according to its shareholding interest not exceeding Baht 410.50 million during the commercial operation period.

**Utilities and Other Services Agreements with minimum purchase quantity**

The Group has 19 utilities and other services agreements which have minimum purchase quantity with other parties. These agreements are for the periods from 4 years to 30 years, commencing from the date as specified in each agreement and expiring in March 2022 to September 2035. The minimum purchase quantity, the selling price of products and the renewal of the contract will be subject as specified in the agreements.

## 37. LITIGATIONS

### a) Purchase and sales of raw materials agreement legal case

On December 3, 2009, a company filed for arbitration against PTT Plc. (“PTT”) and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 13,805 million. On March 8, 2010, the dispute was struck out of the case-list by the arbitration ruling that the Company was not a party to the contract.

On August 27, 2010, the said company filed a civil suit to the Civil Court against PTT and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 9,380 million. In this regards, the Company filed an objection against the indictment with the Civil Court on the basis that the Company was not a party to the contract.

On May 21, 2013, the Civil Court considered that the arbitration process between such company and PTT has not yet been finalised; therefore, the Court has temporarily struck the case out of the case-list until the final decision has been reached under arbitration process. Then, both parties or either party can resubmit the case to the Civil Court for the further trial.

Subsequently, on March 25, 2016, the arbitration has reached a conclusion for PTT to compensate the damages in some amount. On June 30, 2016, PTT submitted a motion for setting aside the arbitral award to the Civil Court. Thereafter, on September 19, 2019, the Civil Court rendered the judgement for enforcement of the arbitral award. PTT has appealed against the Civil Court’s judgement to the Supreme Court and the case is currently under the consideration of the Supreme Court. The Company believes that the outcome of the consideration will not result in any liability to the Company, because the arbitral award and the judgement shall not be enforced on the Company due to the fact that the Company was not the party in the case. Therefore, the Company has not recorded any provisions against any losses that may result from this matter in the financial statements.

### b) Oil spill incident legal case

During the third quarter of 2014, the number of people in Rayong filed several lawsuits with the Civil Court and the Rayong Provincial Court against the Company to claim the extra compensation from oil spill incident and to perform the rehabilitation of the sea and natural environmental recovery. Some cases have been dismissed and some cases have been passed a judgement on August 25, 2016 by the Civil Court to compensate the Company to compensate for damages including interest and rehabilitation of approximately Baht 11.26 million. The Company has appealed on February 17, 2017. Subsequently, on May 11, 2018, the Company made compromise agreements with majority plaintiffs at the Civil Court. On December 20, 2018, the Court of Appeal has passed the judgement according to the compromise agreements which the Company has already paid compensation in full amount. For the remaining plaintiffs, the Court of Appeal ordered the Company to pay compensation with its interest according to the judgement of the Court of First Instance and reduced the amount of interest. The Company has paid the compensation to all plaintiffs completely and no petition is submitted to Supreme Court by any plaintiffs. This case has become final.

For the case at Rayong Provincial Court, on September 28, 2018, the Court has made the judgement ordering the Company to pay damage cost with its interest of approximately Bath 38 million by deducting the remedy payment paid to the plaintiffs of Baht 24 million. The Company deposited the remaining damage cost with its interest to the Rayong Provincial Court on February 25, 2019. Some plaintiffs filed an appeal with the Rayong Provincial Court and the Company has filed an answer to the appeal with the Rayong Provincial Court on October 2, 2019. Subsequently, on January 22, 2020, the Rayong Provincial Court sent an appointment to hear the judgment of the Court of Appeal Region 2 on March 19, 2020 and the Court of Appeal Region 2 has postponed the date of hearing the judgment. On September 1, 2020, the Court of Appeal Region 2 has made the judgement ordering the Company to pay damage cost with its interest to the plaintiffs. The Company deposited the amount of Baht 25 million to the Rayong Provincial Court on September 30, 2020. Afterwards, on October 14, 2020, the Rayong Provincial Court sent an appointment to hear the judgement or the order of the Court of Appeal Region 2 on November 26, 2020. However, the plaintiffs have applied a motion to extend the Dika appeal period to March 1, 2021.



**c) Transfer of right for the payment of raw materials legal case of the subsidiary**

- c.1) The subsidiary was informed by a company who received the transfer of claim from the supplier of the subsidiary for the payment of raw materials, which the supplier of the subsidiary borrowed from a company to purchase raw materials to sell to the subsidiary and the subsidiary had to pay for the raw materials to that company under the transfer of right for the payment of raw materials. After reviewing the provided documents, the subsidiary informed to a company that these documents were not in the system, nor there was no evidence regarding the delivery of raw materials as prescribed in the documents. Subsequently, on August 20, 2018, a company filed a civil lawsuit against the supplier of the subsidiary and the subsidiary as joint defendants for violation of loan agreement and transfer of claim, with damage claimed amounting to Baht 308.75 million with interest rate at 15% per annum amounting to Baht 15.90 million, totalling Baht 324.65 million. The subsidiary's legal advisor considered the fact and the relevant evidences and provided opinion that the subsidiary is not liable for allegation. Therefore, the subsidiary appointed the lawyer and filed a statement of defense.

Subsequently on June 10, 2020, the First Instance issued its judgement and stipulated that the subsidiary shall pay damages of approximately Baht 289.56 million, including interest at the rate of 15% per annum from the default date to that company, and that the subsidiary and the supplier of the subsidiary shall jointly pay court fees by assigning a lawyer fee of Baht 1 million. However, the case is not yet settled, and the subsidiary and its legal advisor have considered the relevant facts and evidences and still confident on the subsidiary's ground of defenses for this case. The subsidiary filed an appeal on November 25, 2020. Currently, it is in the process of court proceedings, therefore the subsidiary has not recorded any provision against any losses from such case.

- c.2) On February 27, 2019, a financial institution filed a civil lawsuit against the supplier of the subsidiary, director of supplier of the subsidiary and the subsidiary as joint defendants for violation of credit limit agreement, sale of promissory notes, transfer of money, guarantee and forced mortgage, with damage claimed amounting to Baht 55.95 million and interest amounting to Baht 3.49 million, totaling Baht 59.44 million. Therefore, the subsidiary filed a statement of defense. On October 28, 2019, the plaintiff submitted the motion for permission to withdraw the plicant against the subsidiary and the Court granted such permission and struck the case out of the case-list of the Court.
- c.3) On September 8, 2020, the subsidiary received a summons and a copy of a Civil Court plaint from a company, a former supplier of the subsidiary, to filed a civil lawsuit against the subsidiary regarding the breach of an agreement concerning the reclaiming of purchase price on raw materials and claiming damages on the principal of Baht 470.03 million with interest at the rate of 7.5% per annum, amounting to Baht 595.10 million, starting from the date of the lawsuit until the date of completion of payment.

On November 8, 2020, the subsidiary received a summons and a copy of a Civil Court plaint from the aforementioned company to filed a civil lawsuit against the subsidiary as the first defendant and two other companies as joint defendants regarding the breach of principal-agent agreements and claiming damages on the principal of Baht 92.29 million with interest at the rate of 7.5% per annum, amounting to Baht 109.42 million, starting from the date of the lawsuit until the date of completion of payment.

On December 25, 2020, the subsidiary received a summons and a copy of a Civil Court plaint from the aforementioned company to filed a civil lawsuit against a supplier and the subsidiary as second defendants regarding the breach of agreements concerning the reclaiming of purchase price on raw materials and claiming damages on the principal of Baht 305.26 million with interest at the rate of 7.5% per annum, amounting to Baht 364.71 million, starting from the date of the lawsuit until the date of completion of payment.

The subsidiary and legal advisor of the subsidiary have considered relevant facts and evidences in all three cases and provided the opinion that the subsidiary has not breached the agreement and has no obligation to pay as claimed. Therefore, the subsidiary has appointed a lawyer and will file testimony with its defense in accordance with the applicable law. Therefore, the subsidiary has not recorded any provision against any losses from such case.

**38. EVENT AFTER THE REPORTING PERIOD**

At the Board of Directors' Meeting of the Company held on February 15, 2021, the Board approved to submit for approval by the Annual General Meeting of the shareholders for the annual dividend payment from 2020 performance at Baht 1.00 per share to the shareholders entitled to receive the dividend, amounting to Baht 4,487 million. Such dividend is subjected to the approval of the shareholders at the Annual General Meeting to be held on April 5, 2021.

**39. APPROVAL OF THE FINANCIAL STATEMENTS**

These financial statements have been approved for issue by the Board of Directors on February 15, 2021.

## REPORT OF THE INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

TO THE SHAREHOLDERS AND BOARD OF DIRECTORS  
PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED

### Opinion

We have audited the consolidated financial statements of PTT Global Chemical Public Company Limited and its subsidiaries (the “Group”) and the separate financial statements of PTT Global Chemical Public Company Limited (the “Company”) which comprise the consolidated and separate statements of financial position as at December 31, 2019, and the related consolidated and separate statements of profit or loss, comprehensive income, changes in shareholders’ equity and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated and separate financial statements present fairly, in all material respects, the financial position of PTT Global Chemical Public Company Limited and its subsidiaries and of PTT Global Chemical Public Company Limited as at December 31, 2019, and financial performance and cash flows for the year then ended in accordance with Thai Financial Reporting Standards (“TFRSs”).

### Basis for Opinion

We conducted our audit in accordance with Thai Standards on Auditing (“TSAs”). Our responsibilities under those standards are further described in the Auditor’s Responsibilities for the Audit of the Consolidated and Separate Financial Statements section of our report. We are independent of the Group in accordance with the Federation of Accounting Professions’ Code of Ethics for Professional Accountants together with the ethical requirements that are relevant to the audit of the consolidated and separate financial statements, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

### Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated and separate financial statements of the current period. These matters were addressed in the context of our audit of the consolidated and separate financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Key Audit Matter	Audit Responses
<p><b>The measurement of inventories valuation</b></p> <p>Inventories of the Group are significant balance to the consolidated and separate financial statements. The raw material and finished goods are commodities that contain intense price volatility. This volatility may lead to valuation of inventories at the end of reporting period as inventories are measured at the lower of cost or net realizable value.</p> <p>The accounting policy of inventories valuation of the Group and the detail of inventories are disclosed in notes to the financial statements no. 3.7 and 9, respectively.</p>	<p>Key audit procedures included:</p> <ul style="list-style-type: none"><li>• Gaining understanding and performing test of design and implementation as well as operating effectiveness of the relevant controls over inventories valuation measurement process.</li><li>• Assessing the appropriateness of the methodology used to calculate the net realizable value of inventories at the reporting period, considering the reasonableness of the market price used by reference to commodity prices, and testing the accuracy of the calculation.</li><li>• If the net realizable value is lower than the cost, considering to propose the adjustment of allowance for diminution in value of inventories in the consolidated and separate financial statements.</li><li>• Assessing the adequate disclosure in relation to the estimation of allowance for diminution in value of inventories in notes to the financial statements.</li></ul>

<b>Key Audit Matter</b>	<b>Audit Responses</b>
<p><b>The existence of raw materials</b></p> <p>During the second quarter of 2018, a subsidiary found the quantity of raw materials recorded in the system higher than the actual quantity stored at the suppliers' facilities. In consequence, the Group recognized expenses from raw materials derogation amounting to Baht 2,004 million for the year ended December 31, 2018 (owners of the parent net of tax amounting to Baht 1,261 million). The existence of raw materials is considered to be a key audit matter as such raw materials are stored at the suppliers' facilities where the place are outside of the subsidiary's location.</p> <p>The details are disclosed in note to the financial statements no. 4.</p>	<p>Key audit procedures included:</p> <ul style="list-style-type: none"> <li>• Gaining understanding and performing test of design and implementation of the relevant controls over raw material management process.</li> <li>• Enquiring with management on procurement of raw materials, issuing and storage of raw materials process.</li> <li>• Reading the factual investigation report regarding the procurement and distribution process of raw materials, the fraud investigation report, the internal control report for the process on procurement of raw materials and the related minutes of meeting of the board of directors.</li> <li>• Attending the physical raw material count observation, sending the raw material confirmation letter for raw materials at the storage facilities of the suppliers and reconciling confirmations with the accounting records.</li> </ul>

#### **Other Matter**

The consolidated financial statements of PTT Global Chemical Public Company Limited and its subsidiaries and the separate financial statements of PTT Global Chemical Public Company Limited for the year ended December 31, 2018 (before the reclassifications), presented herein as comparative information, were audited by another auditor, whose report thereon dated February 18, 2019 expressed an unmodified opinion on those statements.

#### **Other Information**

Management is responsible for the other information. The other information comprises the information included in the annual report, but does not include the consolidated and separate financial statements and our auditor's report thereon.

Our opinion on the consolidated and separate financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the consolidated and separate financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

#### **Responsibilities of Management and Those Charged with Governance for the Consolidated and Separate Financial Statements**

Management is responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRSs, and for such internal control as management determines is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated and separate financial statements, management is responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

### **Auditor's Responsibilities for the Audit of the Consolidated and Separate Financial Statements**

Our objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated and separate financial statements.

As part of an audit in accordance with TSAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's and the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated and separate financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

**BANGKOK**  
February 17, 2020

Mongkol Somphol  
Certified Public Accountant (Thailand)  
Registration No. 8444  
**DELOITTE TOUCHE TOHMATSU JAIYOS AUDIT CO., LTD.**

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF FINANCIAL POSITION**  
**AS AT DECEMBER 31, 2019**

Unit : Baht

	Notes	Consolidated		Separate	
		financial statements		financial statements	
		2019	2018	2019	2018
<b>ASSETS</b>					
<b>CURRENT ASSETS</b>					
Cash and cash equivalents	6	18,840,303,824	36,744,040,127	12,397,417,335	27,141,980,258
Temporary investments	13	6,719,876,693	16,817,920,867	4,045,408,193	10,011,153,767
Trade receivables	7	34,156,903,430	41,990,677,039	28,118,814,466	34,832,891,357
Other receivables	8	3,149,134,830	3,624,987,347	2,314,454,135	2,776,875,934
Short-term loans to related parties	27	1,122,984,334	242,136,000	1,552,287,222	848,799,510
Current portion of long-term loans to related parties	27	1,558,404,698	-	1,558,404,698	-
Current portion of long-term loans to other parties		-	665,367,833	-	-
Inventories	9	36,252,319,422	39,365,633,468	26,380,866,034	29,105,102,076
Receivable from oil fuel fund		151,284,595	819,672,983	151,284,595	819,672,983
Value-added tax receivable		1,719,267,430	2,193,555,033	492,422,615	627,187,239
Derivatives	38	27,747,308	340,523,311	13,789,747	339,827,672
Other current assets		796,042,409	1,505,500,947	526,201,836	1,204,055,609
<b>Total Current Assets</b>		<b>104,494,268,973</b>	<b>144,310,014,955</b>	<b>77,551,350,876</b>	<b>107,707,546,405</b>
<b>NON-CURRENT ASSETS</b>					
Investments in subsidiaries	10	-	-	72,551,269,640	67,782,813,121
Investments in joint ventures	11	32,444,000,414	30,757,746,490	15,372,927,810	15,372,927,810
Investments in associates	12	29,829,463,974	15,450,398,109	26,812,494,981	9,792,804,660
Other long-term investments	13	2,910,779,525	7,146,165,871	2,340,894,476	6,806,191,293
Long-term loans to related parties	27	716,754,888	3,551,328,000	716,754,888	3,551,328,000
Investment properties	14	6,497,895,823	6,499,955,407	1,740,783,392	1,740,783,392
Property, plant and equipment	15	264,563,608,523	250,330,366,033	181,731,952,350	174,490,838,137
Land leasehold rights	16	190,505,835	234,181,354	184,162,171	234,181,354
Goodwill	17	931,328,672	931,328,672	-	-
Intangible assets	18	8,220,730,578	8,055,084,199	5,809,170,180	5,603,820,101
Deferred tax assets	19	1,073,520,214	1,171,330,392	-	-
Derivatives	38	-	122,469,564	-	122,469,564
Other non-current assets		641,532,387	694,978,299	278,035,974	408,721,068
<b>Total Non-current Assets</b>		<b>348,020,120,833</b>	<b>324,945,332,390</b>	<b>307,538,445,862</b>	<b>285,906,878,500</b>
<b>TOTAL ASSETS</b>		<b>452,514,389,806</b>	<b>469,255,347,345</b>	<b>385,089,796,738</b>	<b>393,614,424,905</b>

Notes to the financial statements form an integral part of these statements

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES

STATEMENTS OF FINANCIAL POSITION (CONTINUED)

AS AT DECEMBER 31, 2019

Unit : Baht

	Notes	Consolidated		Separate	
		financial statements		financial statements	
		2019	2018	2019	2018
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>					
<b>CURRENT LIABILITIES</b>					
Short-term borrowings from					
financial institutions	20	2,020,952,712	3,343,116,790	-	-
Trade payables	21	25,479,128,189	34,515,941,639	19,920,282,931	27,459,926,202
Other payables	22	14,092,519,798	15,867,926,247	8,443,466,497	11,712,990,634
Payables to contractors		2,717,169,778	9,127,020,070	2,778,691,141	5,191,027,808
Current portion of long-term borrowings					
from financial institutions	20	8,108,139,389	7,046,779,688	7,077,794,084	4,305,696,000
Current portion of long-term borrowings					
from other parties	20	40,599,692	927,744,204	-	-
Current portion of debentures	20	-	1,942,000,000	-	1,942,000,000
Short-term borrowings from related parties	20, 27	-	-	3,040,910,019	1,930,884,839
Income tax payable		125,041,110	665,994,033	-	473,886,450
Current provisions		97,106,390	65,762,666	-	-
Derivatives	38	319,631,248	310,771,095	68,847,127	2,871,113
Other current liabilities		32,849,201	45,197,792	-	-
Total Current Liabilities		53,033,137,507	73,858,254,224	41,329,991,799	53,019,283,046
<b>NON-CURRENT LIABILITIES</b>					
Long-term borrowings from					
financial institutions	20	26,517,395,423	30,915,455,205	2,995,267,683	10,113,474,702
Long-term borrowing from a related party	20, 27	-	-	14,991,042,331	16,105,004,749
Long-term borrowings from other parties	20	268,922,401	323,961,074	-	-
Debentures	20	70,131,423,772	52,408,085,202	55,221,250,537	36,379,430,264
Deferred tax liabilities	19	2,465,252,662	2,746,711,153	1,591,933,250	1,788,503,320
Provisions for employee benefits	23	5,558,472,038	4,283,089,819	4,014,311,572	3,015,279,364
Other non-current provisions		420,019,035	494,903,862	-	-
Derivatives	38	12,423,815	146,534,450	12,423,815	20,581,971
Other non-current liabilities		511,994,977	596,144,422	359,936,366	336,086,298
Total Non-current Liabilities		105,885,904,123	91,914,885,187	79,186,165,554	67,758,360,668
<b>TOTAL LIABILITIES</b>		158,919,041,630	165,773,139,411	120,516,157,353	120,777,643,714



PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES  
STATEMENTS OF FINANCIAL POSITION (CONTINUED)  
AS AT DECEMBER 31, 2019

Unit : Baht

	Notes	Consolidated financial statements		Separate financial statements	
		2019	2018	2019	2018
<b>LIABILITIES AND SHAREHOLDERS' EQUITY</b>					
(CONTINUED)					
SHAREHOLDERS' EQUITY					
Share capital	24				
Authorized share capital					
4,508,849,117 ordinary shares of					
Baht 10 each		45,088,491,170	45,088,491,170	45,088,491,170	45,088,491,170
Issued and paid-up share capital					
4,508,849,117 ordinary shares of					
Baht 10 each		45,088,491,170	45,088,491,170	45,088,491,170	45,088,491,170
Treasury stock	26	(1,187,603,325)	-	(1,187,603,325)	-
Premium on ordinary shares	25	36,936,829,684	36,936,829,684	36,936,829,684	36,936,829,684
Premium on treasury stock	25	1,386,740,109	1,386,740,109	1,386,740,109	1,386,740,109
Difference arising from business combination under common control	25	1,690,706,891	1,690,706,891	77,453,518	77,453,518
Difference arising from the change in the ownership interest in an investment	12	(3,407,679,334)	-	-	-
Retained earnings					
Appropriated					
Legal reserve	25	4,512,930,269	4,512,930,269	4,512,930,269	4,512,930,269
Loan repayment reserve		807,802,564	807,802,564	807,802,564	807,802,564
Projects expansion reserve		12,446,994,126	12,446,994,126	12,446,994,126	12,446,994,126
Treasury stock reserve	25, 26	1,187,603,325	-	1,187,603,325	-
Unappropriated		187,854,749,537	192,959,190,549	163,299,727,947	171,114,157,807
Other components of shareholder's equity		(1,487,395,383)	216,077,207	16,669,998	465,381,944
Total attributions to owners of the parent		285,830,169,633	296,045,762,569	264,573,639,385	272,836,781,191
Non-controlling interests		7,765,178,543	7,436,445,365	-	-
<b>TOTAL SHAREHOLDERS' EQUITY</b>		<b>293,595,348,176</b>	<b>303,482,207,934</b>	<b>264,573,639,385</b>	<b>272,836,781,191</b>
<b>TOTAL LIABILITIES AND</b>					
<b>SHAREHOLDERS' EQUITY</b>		<b>452,514,389,806</b>	<b>469,255,347,345</b>	<b>385,089,796,738</b>	<b>393,614,424,905</b>

Notes to the financial statements form an integral part of these statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF PROFIT OR LOSS**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**

		Unit : Baht			
		Consolidated		Separate	
		financial statements		financial statements	
Notes		2019	2018	2019	2018
Revenues from sale of goods and rendering of services		412,810,235,767	518,654,742,421	351,547,082,842	456,714,288,455
Cost of sale of goods and rendering of services		(390,619,277,638)	(466,025,790,273)	(339,068,290,381)	(418,114,455,761)
Gross profit		22,190,958,129	52,628,952,148	12,478,792,461	38,599,832,694
Investment income		1,000,821,422	1,577,303,108	5,195,501,283	6,284,765,652
Other income		1,317,855,026	1,117,147,616	1,916,888,618	2,049,607,521
Gain on bargain purchases	5	31,482,857	1,354,901,971	-	-
Selling and distribution expenses	29	(3,931,395,732)	(3,405,829,379)	(1,962,918,351)	(1,957,010,454)
Administrative expenses	30	(12,537,256,860)	(11,448,544,361)	(8,741,700,962)	(8,235,597,296)
Reversal of (expenses from) raw materials derogation	4	232,483,965	(2,003,572,583)	-	-
Loss on impairment of assets		-	-	(63,052,760)	(729,567,425)
Net derivative gain		1,498,820,135	122,019,087	1,499,404,054	65,021,626
Net gain (loss) on foreign exchange rate		1,755,535,325	13,073,207	1,523,281,288	(200,854,878)
Finance costs	33	(3,119,419,221)	(3,593,353,668)	(2,618,771,176)	(2,927,274,215)
Share of profit of investments in joint ventures	11	2,625,714,096	5,208,691,184	-	-
Share of profit of investments in associates	12	1,933,059,453	1,686,140,092	-	-
Profit before income tax expense		12,998,658,595	43,256,928,422	9,227,424,455	32,948,923,225
Income tax expense	34	(649,361,925)	(2,985,954,248)	(74,349,225)	(3,228,105,397)
<b>PROFIT FOR THE YEAR</b>		<u>12,349,296,670</u>	<u>40,270,974,174</u>	<u>9,153,075,230</u>	<u>29,720,817,828</u>
<b>PROFIT ATTRIBUTABLE TO</b>					
Owners of the parent		11,682,079,566	40,069,490,129	9,153,075,230	29,720,817,828
Non-controlling interests		667,217,104	201,484,045	-	-
		<u>12,349,296,670</u>	<u>40,270,974,174</u>	<u>9,153,075,230</u>	<u>29,720,817,828</u>
<b>BASIC EARNINGS PER SHARE</b>	36	2.59	8.89	2.03	6.59

Notes to the financial statements form an integral part of these statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF COMPREHENSIVE INCOME**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**

Unit : Baht

	Notes	Consolidated financial statements		Separate financial statements	
		2019	2018	2019	2018
<b>PROFIT FOR THE YEAR</b>		12,349,296,670	40,270,974,174	9,153,075,230	29,720,817,828
<b>OTHER COMPREHENSIVE INCOME (LOSS)</b>					
Items that will be reclassified subsequently to profit or loss					
Exchange differences on translating financial statements		(675,835,696)	(138,916,708)	-	-
Gain (loss) on remeasurement investments held as available-for-sale		33,877,577	(90,402,521)	33,877,577	(90,402,521)
Gain (loss) on cash flow hedges		(262,701,249)	807,423,355	(482,589,523)	658,371,137
Share of other comprehensive loss of joint ventures	11	(446,306,794)	(399,462,671)	-	-
Share of other comprehensive income (loss) of associates	12	(383,170,024)	13,701,315	-	-
Items that will not be reclassified subsequently to profit or loss					
Gain (loss) on remeasurements of defined benefit plans		(54,831,636)	20,353,699	-	-
Share of other comprehensive income (loss) of joint ventures	11	(85,407,851)	25,893,879	-	-
Share of other comprehensive loss of associates	12	(1,911,962)	(8,585,329)	-	-
<b>OTHER COMPREHENSIVE INCOME (LOSS)</b>					
<b>FOR THE YEAR, NET OF TAX</b>		(1,876,287,635)	230,005,019	(448,711,946)	567,968,616
<b>TOTAL COMPREHENSIVE INCOME</b>					
<b>FOR THE YEAR, NET OF TAX</b>		10,473,009,035	40,500,979,193	8,704,363,284	30,288,786,444
<b>TOTAL COMPREHENSIVE INCOME</b>					
<b>ATTRIBUTABLE TO</b>					
Owners of the parent		9,840,397,339	40,337,826,087	8,704,363,284	30,288,786,444
Non-controlling interests		632,611,696	163,153,106	-	-
		10,473,009,035	40,500,979,193	8,704,363,284	30,288,786,444

Notes to the financial statements form an integral part of these statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**

Unit : Baht

		Retained earnings										Other components of shareholders' equity									
Notes	Issued and paid-up share capital	Treasury stock	Premium on ordinary shares	Premium on treasury stock	Difference arising from business combination under common control	Difference arising from the change in the ownership interest in an investment	Legal reserve	Loans repayment reserve	Projects expansion reserve	Treasury stock reserve	Unappropriated	Exchange differences on translating financial statements	Gain (loss) on remeasurement investments held as available-for-sale	Gain (loss) on cash flow hedges	Share of other comprehensive income (loss) of joint ventures	Share of other comprehensive income (loss) of associates	Total other components of shareholders' equity	Total attributions to the parent owners of	Non-controlling interests	Total shareholders' equity	
	<b>BALANCE AS AT JANUARY 1, 2018</b>	45,088,491,170	-	36,936,829,684	1,386,740,109	1,690,706,891	-	4,512,930,269	807,802,564	12,446,994,126	-	172,015,687,267	(383,885,257)	142,086,228	(789,930,586)	1,007,174,278	8,090,365	(16,464,972)	274,869,717,108	5,394,380,348	280,264,097,456
37	Dividends paid	-	-	-	-	-	-	-	-	-	(19,161,780,626)	-	-	-	-	-	-	-	(19,161,780,626)	(577,303,184)	(19,739,083,810)
	Acquisition of businesses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,363,403,595	2,363,403,595
	Increase investment in a subsidiary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92,811,500	92,811,500
	Profit for the year	-	-	-	-	-	-	-	-	-	40,069,490,129	-	-	-	-	-	-	-	40,069,490,129	201,484,045	40,270,974,174
	Other comprehensive income (loss)	-	-	-	-	-	-	-	-	35,793,779	(96,351,209)	(90,402,521)	805,057,265	(399,462,671)	13,701,315	232,542,179	268,335,958	(38,330,939)	230,005,019		
	<b>BALANCE AS AT DECEMBER 31, 2018</b>	45,088,491,170	-	36,936,829,684	1,386,740,109	1,690,706,891	-	4,512,930,269	807,802,564	12,446,994,126	-	192,959,190,549	(480,236,466)	51,683,707	15,126,679	607,711,607	21,791,680	216,077,207	296,045,762,569	7,436,445,365	303,482,207,934
	<b>BALANCE AS AT JANUARY 1, 2019</b>	45,088,491,170	-	36,936,829,684	1,386,740,109	1,690,706,891	-	4,512,930,269	807,802,564	12,446,994,126	-	192,959,190,549	(480,236,466)	51,683,707	15,126,679	607,711,607	21,791,680	216,077,207	296,045,762,569	7,436,445,365	303,482,207,934
26	Treasury stock	-	(1,187,603,325)	-	-	-	-	-	-	1,187,603,325	(1,187,603,325)	-	-	-	-	-	-	-	(1,187,603,325)	-	(1,187,603,325)
37	Dividends paid	-	-	-	-	-	-	-	-	-	(15,779,901,765)	-	-	-	-	-	-	-	(15,779,901,765)	(556,380,393)	(16,336,282,158)
	Increase investment in a subsidiary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	252,501,875	252,501,875
12	Difference arising from the change in the ownership interest in an investment	-	-	-	-	(3,407,679,334)	-	-	-	-	-	-	-	-	-	-	-	-	(3,407,679,334)	-	(3,407,679,334)
	Interests in equity of associate	-	-	-	-	-	-	-	-	-	319,194,149	-	-	-	-	-	-	-	319,194,149	-	319,194,149
	Profit for the year	-	-	-	-	-	-	-	-	-	11,682,079,566	-	-	-	-	-	-	-	11,682,079,566	667,217,104	12,349,296,670
	Other comprehensive income (loss)	-	-	-	-	-	-	-	-	(138,209,637)	(644,186,753)	33,877,577	(263,686,596)	(446,306,794)	(383,170,024)	(1,703,472,590)	(1,841,682,227)	(34,605,408)	(1,876,287,635)		
	<b>BALANCE AS AT DECEMBER 31, 2019</b>	45,088,491,170	(1,187,603,325)	36,936,829,684	1,386,740,109	1,690,706,891	(3,407,679,334)	4,512,930,269	807,802,564	12,446,994,126	1,187,603,325	187,854,749,537	(1,124,423,219)	85,561,284	(248,559,917)	161,404,813	(561,378,344)	(1,487,395,383)	285,830,169,633	7,765,178,543	293,595,348,176

Notes to the financial statements form an integral part of these statements

PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES  
STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY  
FOR THE YEAR ENDED DECEMBER 31, 2019

Unit : Baht

Separate financial statements

Notes	Retained earnings										Other components of shareholders' equity			
	Issued and paid-up share capital	Treasury stock	Premium on ordinary shares	Premium on treasury stock	Difference arising from business combination under common control	Legal reserve	Loans repayment reserve	Projects expansion reserve	Treasury stock reserve	Unappropriated	Gain (loss) on remeasurement investments held as available-for-sale	Gain (loss) on cash flow hedges	Total other components of shareholders' equity	Total shareholders' equity
<b>BALANCE AS AT JANUARY 1, 2018</b>	45,088,491,170	-	36,936,829,684	1,386,740,109	77,453,518	4,512,930,269	807,802,564	12,446,994,126	-	160,555,120,605	142,086,228	(244,672,900)	(102,586,672)	261,709,775,373
Dividends paid	37	-	-	-	-	-	-	-	-	(19,161,780,626)	-	-	-	(19,161,780,626)
Profit for the year	-	-	-	-	-	-	-	-	-	29,720,817,828	-	-	-	29,720,817,828
Other comprehensive income (loss)	-	-	-	-	-	-	-	-	-	-	(90,402,521)	658,371,137	567,968,616	567,968,616
<b>BALANCE AS AT DECEMBER 31, 2018</b>	<b>45,088,491,170</b>	<b>-</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>77,453,518</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>-</b>	<b>171,114,157,807</b>	<b>51,683,707</b>	<b>413,698,237</b>	<b>465,381,944</b>	<b>272,836,781,191</b>
<b>BALANCE AS AT JANUARY 1, 2019</b>	45,088,491,170	-	36,936,829,684	1,386,740,109	77,453,518	4,512,930,269	807,802,564	12,446,994,126	-	171,114,157,807	51,683,707	413,698,237	465,381,944	272,836,781,191
Treasury stock	26	(1,187,603,325)	-	-	-	-	-	-	1,187,603,325	(1,187,603,325)	-	-	-	(1,187,603,325)
Dividends paid	37	-	-	-	-	-	-	-	-	(15,779,901,765)	-	-	-	(15,779,901,765)
Profit for the year	-	-	-	-	-	-	-	-	-	9,153,075,230	-	-	-	9,153,075,230
Other comprehensive income (loss)	-	-	-	-	-	-	-	-	-	-	33,877,577	(482,589,523)	(448,711,946)	(448,711,946)
<b>BALANCE AS AT DECEMBER 31, 2019</b>	<b>45,088,491,170</b>	<b>(1,187,603,325)</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>77,453,518</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>1,187,603,325</b>	<b>163,299,727,947</b>	<b>85,561,284</b>	<b>(68,891,286)</b>	<b>16,669,998</b>	<b>264,573,639,385</b>

Notes to the financial statements form an integral part of these statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF CASH FLOWS**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**

	Unit : Baht			
	Consolidated		Separate	
	financial statements		financial statements	
	2019	2018	2019	2018
<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>				
Profit for the year	12,349,296,670	40,270,974,174	9,153,075,230	29,720,817,828
Adjustments for:				
Income tax expense	649,361,925	2,985,954,248	74,349,225	3,228,105,397
Depreciation and amortization	19,197,797,105	19,054,766,596	13,366,391,225	13,926,079,334
Investment income	(1,000,821,422)	(1,577,303,108)	(5,195,501,283)	(6,284,765,652)
Gain on settlement of borrowings	(211,556,237)	-	-	-
Loss from capital distribution of subsidiaries	-	-	69,799	-
Loss from sale of investment in an associate	13,115,757	-	-	-
Finance costs	3,119,419,221	3,593,353,668	2,618,771,176	2,927,274,215
Unrealised (gain) loss on derivatives	(54,827,103)	136,879,945	(19,990,128)	118,341,564
Gain on foreign exchange rates	(2,518,930,371)	(334,981,690)	(2,279,982,317)	(281,407,352)
Bad debt and doubtful debt expenses	172,882,726	11,218,974	159,994,458	-
(Reversal of) loss on obsolete inventories	(83,122,717)	34,558,967	(50,921,726)	5,046,175
Loss from written-off of assets	52,766,502	5,813,992	69,384,731	8,018,850
(Reversal of) loss on inventories devaluation	(1,060,886,068)	1,346,625,546	(1,089,977,606)	1,330,081,525
(Reversal of) expenses from raw materials derogation	(232,483,965)	2,003,572,583	-	-
Loss on impairment of assets	-	-	63,052,760	729,567,425
(Gain) loss on disposal of property, plant and equipment	40,554,053	22,408,748	(7,941,860)	3,553,332
Provision for employee benefits	1,501,638,645	383,910,976	1,156,107,086	272,715,440
Realised deferred pipeline and equipment income	(8,369,972)	(6,559,468)	(9,792,233)	(7,862,360)
Gain on bargain purchases	(31,482,857)	(1,354,901,971)	-	-
Share of profit of investments in joint ventures	(2,625,714,096)	(5,208,691,184)	-	-
Share of profit of investments in associates	(1,933,059,453)	(1,686,140,092)	-	-
Profit from operations before changes in operating assets and liabilities	27,335,578,343	59,681,460,904	18,007,088,537	45,695,565,721
Operating assets (increase) decrease				
Trade receivables	7,688,772,097	1,972,547,646	6,769,976,249	50,941,794
Other receivables	655,357,356	(2,194,830,878)	504,402,338	286,080,901
Inventories	4,206,895,474	(917,999,476)	3,795,750,644	(1,376,326,558)
Value-added tax receivable	456,218,332	(955,024,742)	134,764,625	(820,811,688)
Other current assets	1,216,416,609	(550,809,553)	1,346,221,634	(297,467,041)
Other non-current assets	(121,134,464)	55,416,788	(24,216,553)	(109,972,896)
Operating liabilities increase (decrease)				
Trade payables	(8,962,108,450)	1,860,866,374	(7,540,342,464)	1,011,331,784
Other payables	(405,767,945)	193,161,182	(2,731,219,413)	(108,196,027)
Current provisions	38,484,724	(29,593,048)	-	-
Other current liabilities	(10,756,357)	11,177,391	-	-
Cash paid for provisions for employee benefits	(233,434,021)	(150,305,564)	(157,074,878)	(89,105,922)
Other non-current provisions	(30,534,035)	54,072,970	-	-
Other non-current liabilities	(105,677,642)	(121,866,769)	(122,090,260)	2,226,848
Cash received from operations	31,728,310,021	58,908,273,225	19,983,260,459	44,244,266,916
Cash paid for income tax	(1,553,273,997)	(5,279,263,371)	(959,971,523)	(4,743,628,244)
Net cash flows provided by operating activities	30,175,036,024	53,629,009,854	19,023,288,936	39,500,638,672

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**STATEMENTS OF CASH FLOWS (CONTINUED)**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**

	Unit : Baht			
	Consolidated		Separate	
	financial statements		financial statements	
	2019	2018	2019	2018
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>				
Interest received	970,074,693	922,850,661	796,872,684	786,413,438
Dividends received	2,247,743,282	2,399,301,624	4,372,126,568	4,893,350,060
Acquisition of investment properties	-	(5,523,531,948)	-	-
Acquisition of property, plant and equipment	(39,827,749,088)	(27,760,616,724)	(22,275,592,652)	(15,731,041,673)
Proceeds from sale of property, plant and equipment	129,650,962	94,672,013	118,513,574	93,880,905
Acquisition of intangible assets	(989,177,952)	(1,016,175,888)	(720,528,657)	(777,243,580)
Acquisition of other non-current assets	(6,981,143)	-	-	-
(Increase) decrease of held-to-maturities debt securities	4,245,796,605	(2,288,774,783)	240,351,300	1,830,441,452
Decrease of available-for-sale securities	10,368,985,604	187,747,103	10,368,985,604	187,747,103
Acquisition of investments in subsidiaries, joint ventures and associates	(19,061,859,511)	(3,023,883,732)	(22,562,924,510)	(11,454,800,880)
Cash inflow from sale of investment in an associate	212,663,057	-	-	-
Cash inflow from capital distribution of subsidiaries	-	-	1,927,949	40,770,000
Cash paid for other non-marketable equity securities	(259,855,403)	(57,098,062)	(1,125,000)	-
Cash inflow from sales of other non-marketable equity securities	28,289,253	246,395,861	28,289,253	246,395,861
Proceeds from short-term loans to related parties	7,101,928,666	-	7,279,289,288	120,023,452
Increase in short-term loans to related parties	(8,000,000,000)	(234,817,500)	(8,000,000,000)	(485,469,576)
Proceeds from long-term loans to related parties	1,827,494,000	3,212,377,500	1,827,494,000	3,212,377,500
Increase in long-term loans to related parties	(766,981,093)	-	(766,981,093)	-
Net cash flows used in investing activities	(41,779,978,068)	(32,841,553,875)	(29,293,301,692)	(17,037,155,938)
<b>CASH FLOWS FROM FINANCING ACTIVITIES</b>				
Finance costs paid	(2,917,779,970)	(3,403,044,412)	(2,449,463,098)	(2,887,032,853)
Dividends paid	(16,336,282,158)	(19,739,083,810)	(15,779,901,765)	(19,161,780,626)
Repayment of finance lease liabilities	(175,771,913)	(152,762,836)	(121,544,992)	(122,484,066)
Proceeds from short-term borrowings from financial institutions	144,468,261	18,524,232,681	-	16,452,870,311
Proceeds from short-term borrowings from related parties	-	-	1,579,522,387	105,299,204
Proceeds from long-term borrowings from financial institutions	13,237,281,710	14,438,870,000	-	-
Proceeds from long-term borrowing from a related party	-	-	-	16,472,854,839
Proceeds from long-term borrowings from other parties	15,637,595	127,959,729	-	-
Repayment of short-term borrowings from financial institutions	(1,425,000,000)	(18,388,851,664)	-	(16,452,870,311)
Repayment of short-term borrowings from related parties	-	-	(469,497,207)	(732,420,891)
Repayment of long-term borrowings from financial institutions	(16,083,908,280)	(18,069,061,020)	(4,280,202,000)	(6,793,400,000)
Repayment of long-term borrowings from other parties	(42,186,998)	(746,806,619)	-	-
Proceeds from increase in investment in a subsidiary				
from non-controlling interests	252,501,875	92,811,500	-	-
Proceeds from debentures	20,000,000,000	16,371,246,158	20,000,000,000	-
Repayment of debentures	(1,942,000,000)	(16,452,870,311)	(1,942,000,000)	(16,452,870,311)
Cash paid for treasury stock	(1,187,603,325)	-	(1,187,603,325)	-
Net cash flows used in financing activities	(6,460,643,203)	(27,397,360,604)	(4,650,690,000)	(29,571,834,704)
Net decrease in cash and cash equivalents, before effect from foreign exchange rate	(18,065,585,247)	(6,609,904,625)	(14,920,702,756)	(7,108,351,970)
Effect from foreign exchange rate in cash and cash equivalents and effect from translation differences on financial statements	161,848,944	(75,447,225)	176,139,833	(185,189,619)
Net decrease in cash and cash equivalents	(17,903,736,303)	(6,685,351,850)	(14,744,562,923)	(7,293,541,589)
Cash and cash equivalents as at January 1,	36,744,040,127	43,429,391,977	27,141,980,258	34,435,521,847
<b>Cash and cash equivalents as at December 31,</b>	<b>18,840,303,824</b>	<b>36,744,040,127</b>	<b>12,397,417,335</b>	<b>27,141,980,258</b>

Notes to the financial statements form an integral part of these statements

**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**NOTES TO THE FINANCIAL STATEMENTS**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**

<b>Notes</b>	<b>Contents</b>
1.	The Company's operations and general information
2.	Basis for preparation and presentation of the financial statements
3.	Significant accounting policies
4.	Expenses from raw materials derogation
5.	Acquisition of businesses
6.	Cash and cash equivalents
7.	Trade receivables
8.	Other receivables
9.	Inventories
10.	Investments in subsidiaries
11.	Investments in joint ventures
12.	Investments in associates
13.	Other investments
14.	Investment properties
15.	Property, plant and equipment
16.	Land leasehold right
17.	Goodwill
18.	Intangible assets
19.	Deferred tax
20.	Interest-bearing liabilities
21.	Trade payables
22.	Other payables
23.	Provisions for employee benefits
24.	Share capital
25.	Additional paid-in capital and reserves
26.	Treasury stock
27.	Transactions with related parties
28.	Financial information by segment
29.	Selling and distribution expenses
30.	Administrative expenses
31.	Employee benefits expenses
32.	Expenses by nature
33.	Finance costs
34.	Income tax expense
35.	Promotional privileges
36.	Basic earnings per share
37.	Dividends paid
38.	Financial instruments
39.	Commitments with non-related parties
40.	Litigations
41.	Reclassifications
42.	Events after the reporting period
43.	Approval of the financial statements



**PTT GLOBAL CHEMICAL PUBLIC COMPANY LIMITED AND SUBSIDIARIES**  
**NOTES TO THE FINANCIAL STATEMENTS**  
**FOR THE YEAR ENDED DECEMBER 31, 2019**

**1. THE COMPANY'S OPERATIONS AND GENERAL INFORMATION**

PTT Global Chemical Public Company Limited (the "Company") was registered on October 19, 2011 in accordance with the Public Company Limited Act, B.E. 2535. The Board of Governors of the SET approved the listing of the Company on the day that the Registrar accepted the registration on October 19, 2011.

The Company is a company in the PTT Public Company Limited ("PTT") group of companies. PTT is incorporated in Thailand and is the major shareholder of the Company, holding 47.92% of the Company's issued and paid-up share capital.

The Company is incorporated in Thailand and has its registered offices as follows:

Head Office	: 555/1, Energy Complex, Building A, 14th - 18th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand
Branch 1 (Rayong office Branch)	: 59, Radniyom Road, Tambon Noenphra, Amphoe Mueang Rayong, Rayong, Thailand
Branch 2 (Olefin 1 Branch)	: 14, I-1 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 3 (Olefin 2 Branch)	: 9, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 4 (Aromatics 1 Branch)	: 4, I-2 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 5 (Aromatics 2 Branch)	: 98/9, Rayong 3191 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 6 (Refining Branch)	: 8, I-8 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 7 (Jetty and Buffer Tank Farm Branch)	: 19, Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 8 (Aromatics reserve Branch)	: 11, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 9 (Lab Service Center Branch)	: 24/9, Pakorn Songkrao-Rat Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 10 (PTTGC 10 Branch)	: 555/1, Energy Complex, Building A, 1st , 3rd and 10th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand
Branch 11 (Olefin 3 Branch)	: 8, Phadang Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 12 (Polyethylene Branch)	: 8, Map Ta Phut Industrial Estate, I-10 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 13 (Innoplus Solution Center Branch)	: 83/9-10, Moo 5, Tambon Tabma, Amphoe Mueang Rayong, Rayong, Thailand
Branch 14 (Maintenance office)	: 32, Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand

The principal businesses of the Company are refining and provision of integrated petroleum products, production and distribution of aromatics products including aromatic derivatives and production and distribution of ethylene, propylene, polyethylene plastic pellets and biochemical products. By-products are mixed C4, cracker bottom and tail gas. Minor activities are production and distribution of electricity, water, steam and other utilities. In addition, the Company also operates production support facilities such as jetty and buffer tank farm services for liquid chemical, oil and gas.

## 2. BASIS FOR PREPARATION AND PRESENTATION OF THE FINANCIAL STATEMENTS

- 2.1 The Company and subsidiaries (The “Group”) maintains its accounting records in Thai Baht and prepares its statutory financial statements in the Thai language in conformity with Thai Financial Reporting Standards (TFRS) and accounting practices generally accepted in Thailand.
- 2.2 The Group’s financial statements have been prepared in accordance with the Thai Accounting Standard (TAS) No. 1 (Revised 2018) “Presentation of Financial Statements”, which was effective for financial periods beginning on or after January 1, 2019 onward, and the Regulation of The Stock Exchange of Thailand (SET) dated October 2, 2017, regarding the preparation and submission of financial statements and reports for the financial position and results of operations of the listed companies B.E. 2560 and the Notification of the Department of Business Development regarding “The Brief Particulars in the Financial Statements (No.2) B.E. 2559” dated October 11, 2016.
- 2.3 The financial statements have been prepared under the historical cost convention except as disclosed in the significant accounting policies.
- 2.4 An English version of the financial statements have been prepared from the financial statements that is in the Thai language under law. In the event of a conflict or a difference in interpretation between the two languages, the Thai language financial information shall prevail.
- 2.5 The consolidated financial statements included the accounts of the Company and its subsidiaries, after elimination of intercompany transactions, of which the percentage of shareholding as at December 31, 2019 and 2018, are as follows:

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2019</u>	<u>2018</u>
<i>Direct subsidiaries</i>				
Global Green Chemicals Plc.	Manufacturing and distributing biochemical products	Thailand	72.29	72.29
GC Glycol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Polyols Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	82.10	82.10
GC Marketing Solutions Co., Ltd.	Development, marketing and distributing polymers products, by-products and other polymers-related products	Thailand	100	100

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2019</u>	<u>2018</u>
GC Maintenance and Engineering Co., Ltd.	Factory maintenance and engineering services	Thailand	100	100
GC Logistics Solutions Co., Ltd.	Transportation, warehouse and bagging packing management of polyethylene plastic pellets	Thailand	100	100
GC Ventures Co., Ltd.	Invest in form of Corporate Venture Capital (CVC)	Thailand	100	100
GC Treasury Center Co., Ltd.	Financial service management for the group	Thailand	100	100
GC Styrenics Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Oxirane Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC-M PTA Co., Ltd. (49% Direct interest and 25% Indirect interest) (Formerly Siam Mitsui PTA Co., Ltd.)	Manufacturing and distributing petrochemical products	Thailand	74	74
GC Estate Co., Ltd.	Real estate development for rent and to invest in petrochemical and related industries	Thailand	100	100
Solution Creation Co., Ltd.	Manufacturing and distributing petrochemical products and health and nutrition products	Thailand	100	100
Thai Tank Terminal Limited	Service for the storage and handling of liquid chemicals, oil and gas	Thailand	51	51
Bio Spectrum Co., Ltd. (Liquidation process finalized in January 2019)	Manufacturing and distributing biochemical products	Thailand	-	100
PTT Phenol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
Auria BioChemicals Co., Ltd. (54% Direct interest and 46% Indirect interest) (Liquidation process finalized in April 2019)	Research and development of bio-based chemicals	Thailand	-	100

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2019</u>	<u>2018</u>
NPC Safety and Environmental Service Co., Ltd.	Safety and environmental services	Thailand	100	100
PTTGC America Corporation	Holding and operating international business	United States of America	100	100
PTTGC International Private Limited	Holding and operating international business	Singapore	100	100
<b><i>Indirect subsidiaries</i></b>				
GGC Biochemicals Co., Ltd.	Holding and operating in Thailand	Thailand	100	100
Thai Fatty Alcohols Co., Ltd.	Manufacturing and distributing biochemical products	Thailand	72.29	72.29
Thai Pet Resin Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	74	74
PL Global Transport Co., Ltd.	Transportation of polyethylene plastic pellets	Thailand	100	100
NPC S&E Security Guard Co., Ltd.	Safety services	Thailand	100	100
GC Logistics Solutions (Vietnam) Co., Ltd.	Transportation, warehouse and bagging packing management of polyethylene plastic pellets	Vietnam	100	-
GC Ventures America Corporation	Invest in form of Corporate Venture Capital (CVC) outside Thailand	United States of America	100	100
GCM Polymer Trading DMCC (Formerly Polymer Marketing DMCC)	Distributing polymer products and other polymers-related products	United Arab Emirates	100	100
GC Marketing Solutions Myanmar Co., Ltd. (Formerly Polymer Marketing Myanmar Co., Ltd.)	Distributing polymer products and other polymers-related products	Myanmar	100	100
GC Marketing Solutions Vietnam Co., Ltd. (Formerly Polymer Marketing Vietnam Co., Ltd.)	Distributing polymer products and other polymers-related products	Vietnam	100	100
PT GCM Marketing Solutions Indonesia	Distributing polymer products and other polymers-related products	Indonesia	67	-
PTTGC America LLC	Operating petrochemical business	United States of America	100	100

<u>Name of the entity</u>	<u>Type of business</u>	<u>Country of incorporation</u>	<u>Ownership interest (%)</u>	
			<u>2019</u>	<u>2018</u>
PTTGC Innovation America Corporation	Research and development of bio-based chemicals	United States of America	100	100
PTTGC International (Netherlands) B.V.	Holding and operating international business	Netherlands	100	100
PTTGC International (USA) Inc.	Holding and operating international business	United States of America	100	100
Vencorex Holding	Manufacturing and distributing chemical specialties	France	90.82	90.82

2.6 Thai Financial Reporting Standards affecting the presentation and disclosure in the current period financial statements

During the year, the Group has adopted the revised and new financial reporting standards and guidelines on accounting issued by the Federation of Accounting Professions which become effective for fiscal years beginning on or after January 1, 2019. These financial reporting standards were aimed at alignment with the corresponding International Financial Reporting Standards, with most of the changes directed towards revision of wording and terminology, and provision of interpretations and accounting guidance to users of standards. The adoption of these financial reporting standards does not have any significant impact on the Group's financial statements.

2.7 Thai Financial Reporting Standards announced in the Royal Gazette but not yet effective

The Federation of Accounting Professions has issued the Notification regarding the new and revised Thai Financial Reporting Standards that will be effective for the financial statements for the periods beginning on or after January 1, 2020 onwards. These financial reporting standards were aimed at alignment with the corresponding International Financial Reporting Standards, with most of the changes directed towards revision of wording and terminology, and provision of interpretations and accounting guidance to users of standards without material change in key concept except for the Thai Accounting Standards (TAS), Thai Financial Reporting Standards (TFRS) and Thai Financial Reporting Standard Interpretations (TFRIC):

The following TASs and TFRSs have revision or additional paragraph and accounting guidance:

**Thai Accounting Standards ("TAS")**

TAS 12	Income Taxes
TAS 19	Employee Benefits
TAS 23	Borrowing Costs
TAS 28	Investments in Associates and Joint Ventures

**Thai Financial Reporting Standards ("TFRS")**

TFRS 3	Business Combinations
TFRS 11	Joint Arrangements

The Group's management will adopt the relevant TFRS in the preparation of Group's financial statements when they become effective. The Group's management has assessed the impact of the TFRS and considered that the adoption of the TFRS does not have any significant impact on the financial statements of the Group in the period of initial application.

The following new TFRSs have material change in key concept:

Group of Financial Instruments Standards

**Thai Accounting Standards (“TAS”)**

TAS 32 Financial Instruments: Presentation

**Thai Financial Reporting Standards (“TFRS”)**

TFRS 7 Financial Instruments: Disclosures

TFRS 9 Financial Instruments

**Thai Financial Reporting Standard Interpretations (“TFRIC”)**

TFRIC 16 Hedges of a Net Investment in a Foreign Operation

TFRIC 19 Extinguishing Financial Liabilities with Equity Instruments

These group of Standards make stipulations relating to the classification of financial instruments and their measurement at fair value or amortised cost; taking into account the type of instrument, the characteristics of the contractual cash flows and the Company’s business model, the calculation of impairment using the expected credit loss method, and the concept of hedge accounting. These include stipulations regarding the presentation and disclosure of financial instruments. These Standards will supersede the Standards and Interpretations relating to the financial instruments upon their effective date.

The Group’s management will adopt such TFRS in the preparation of the Group’s financial statements when they become effective. The Group’s management is in the process to assess the impact of the TFRS on the financial statements of the Group in the period of initial application. The Group’s management expected to apply the TFRS as an adjustment to the opening balance of retained earnings or other equity component as at January 1, 2020.

Thai Financial Reporting Standards No. 16 “Leases” (“TFRS 16”)

This TFRS provides a comprehensive model for the identification of lease arrangements and their treatment in the financial statements of both lessees and lessors.

This TFRS will supersede the following lease Standards and Interpretations upon its effective date, which are Thai Accounting Standard No. 17 “Leases” (“TAS 17”), Thai Accounting Standard Interpretation No. 15 “Operating Lease - Incentives”, Thai Accounting Standard Interpretation No. 27 “Evaluating the Substance of Transactions involving the Legal Form of a Lease” and Thai Financial Reporting Standard Interpretation No. 4 “Determining whether an Arrangement contains a Lease”.

For lessee accounting, there are significant changes to lease accounting in this TFRS by removing the distinction between operating and finance leases under TAS 17 and requiring a lessee to recognise a right-of-use asset and a lease liability at commencement for all leases, except for short-term leases and leases of low value assets. However, the lessor accounting treatment continues to require a lessor to classify a lease either as an operating lease or a finance lease, using the same concept as TAS 17.

The Group’s management will adopt such TFRS in the preparation of the Group’s financial statements when it becomes effective. The Group’s management is in the process to assess the impact of the TFRS on the financial statements of the Group in the period of initial application. The Group’s management expected to apply the TFRS using the cumulative effect recognised at the date of initial application as at January 1, 2020.

### 3. SIGNIFICANT ACCOUNTING POLICIES

The accounting policies set out below have been applied consistently to all periods presented in these financial statements.

#### 3.1 Basis of consolidation

The consolidated financial statements relate to the Company and its subsidiaries and the Group's interests in joint ventures and associates.

##### *Business combinations*

The Group applies the acquisition method for all business combinations when control is transferred to the Group, as describe in subsidiaries section, other than those with entities under common control.

The Group recognises goodwill at the acquisition date measured as the excess of (1) over (2) as:

- (1) The aggregate of:
  - the fair value of the consideration transferred;
  - the recognised amount of any non-controlling interests in the acquiree; and
  - if the business combination is achieved in stages, the fair value of the existing equity interest in the acquiree.
- (2) The net fair value of the identifiable assets acquired and liabilities assumed.

If value of (1) is less than (2), difference is contributed to gain on bargain purchase and recognised immediately in profit or loss.

The consideration transferred is recognised at fair value at the acquisition date.

Transaction costs that the Group incurs in connection with a business combination, such as legal fees, and other professional and consulting fees are expensed as incurred.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period, or additional assets or liabilities are recognised, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognised at that date.

##### *Acquisitions from entities under common control*

Business combinations under common control are accounted for using a method similar to the pooling of interest method. Under that method the acquirer recognises assets and liabilities of the acquired businesses at their carrying amounts in the consolidated financial statements of the ultimate parent company at the moment of the transaction. The difference between the carrying amounts of the acquired net assets and the consideration transferred is recognised as surplus or discount from business combinations under common control in shareholder's equity. The surplus or discount will be transferred to retained earnings upon divestment of the businesses acquired.

The results from operations of the acquired businesses will be included in the consolidated financial statements of the acquirer from the beginning of the comparative period or the moment the businesses came under common control, whichever date is later, until control ceases.

##### *Subsidiaries*

Subsidiaries are entities controlled by the Group. The Group controls an entity when it has rights to variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

##### *Non-controlling interests*

At the acquisition date, the Group measures any non-controlling interest at its proportionate interest in the identifiable net assets of the acquiree.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

#### *Loss of control*

When the Group loses control over a subsidiary, it derecognises the assets and liabilities of the subsidiary, and any related non-controlling interests and other components of equity. Any resulting gain or loss is recognised in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

#### *Interests in equity-accounted investees*

The Group's interests in equity-accounted investees comprise interests in joint ventures and associates.

A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than the rights to its assets and obligations for its liabilities. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies.

Interests in joint ventures and associates are accounted for using the equity method. They are recognised initially at cost. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and other comprehensive income of equity-accounted investees, until the date on which joint control or significant influence ceases.

#### *Transactions eliminated on consolidation*

Intra-group balances and transactions and any unrealised income or expenses arising from intra-group transactions are eliminated in the preparing of the consolidated financial statements. Unrealised gains and losses arising from transactions with joint ventures and associates are eliminated against the investment to the extent of the Group's interest in the investee.

### 3.2 Foreign currencies

#### *Foreign currency transactions*

Transactions in foreign currencies are translated to the respective functional currency of Group entities at exchange rate at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate at the reporting date.

Non-monetary assets and liabilities measured at cost in foreign currencies are translated to the functional currency at the exchange rate at the dates of the transactions.

Foreign currency differences arising on retranslation are generally recognised in profit or loss. However, foreign currency differences arising from the translation of qualifying cash flow hedges to the extent that the hedges are effective are recognised in other comprehensive income.

#### *Foreign operations*

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition of foreign operations, are translated to Thai Baht at the exchange rates at the reporting date.

The revenues and expenses of foreign operations are translated to Thai Baht at the average rates during the year.

Foreign exchange differences are recognised in other comprehensive income and presented in the foreign currency translation reserve in equity until disposal of the investment, except to extent that the translation difference is allocated to non-controlling interest.

### 3.3 Derivatives

Derivatives are used to manage exposure to foreign exchange, interest rate arising from operating, financing and investing activities. Derivatives are not used for trading purposes. However, derivatives that do not qualify for hedging instruments are accounted for as trading instruments.

Derivatives are recognised initially at fair value; attributable transaction costs are recognised in profit or loss when incurred. Subsequent to initial recognition, they are remeasured at fair value. The gain or loss on remeasurement is recognised immediately in profit or loss.



The fair value of interest rate swaps is based on broker quotes at the reporting date. Those quotes are tested for reasonableness by discounting estimated future cash flows based on the terms and maturity of each contract and using market interest rates for a similar instrument at the reporting date.

The fair value of forward exchange contracts is based on their listed market price as the reporting date, if available. If the listed market price is not available, then fair value is estimated by forward contract with the same nature and maturity date at the reporting date.

### 3.4 Hedge accounting

#### *Cash flow hedges accounting of the non-financial assets or non-financial liabilities*

When a derivative is designated as the hedging instrument in a hedge of the variability in cash flows of a non-financial asset or non-financial liability, the effective portion of gain or loss from subsequent measurement of fair value of the derivative is recognised in other comprehensive income and presented in the hedging reserve in equity. Any ineffective portion is recognised immediately in profit or loss.

When a hedge of a non-financial asset or non-financial liability occurs, the gain or loss recognised in other comprehensive income is included in the cost of the non-financial asset or non-financial liability.

#### *Discontinuing hedge accounting*

When the hedging instrument expires or is sold, terminated, or no longer qualifies for hedge accounting, the hedge accounting is discontinued prospectively. Any cumulative gain or loss on the hedging instrument existing in equity is retained in equity. When the hedge of the non-financial assets or non-financial liabilities item ultimately occurs, the gain or loss is adjusted according to cash flow hedges accounting.

When the non-financial assets or non-financial liabilities item is no longer expected to occur, the cumulative gain or loss that was reported in equity is recognised in profit or loss immediately.

### 3.5 Cash and cash equivalents

Cash and cash equivalents comprise cash balances, deposits and highly liquid current investments.

### 3.6 Trade and other receivables

Trade and other receivables are stated at their invoice value less allowance for doubtful accounts.

The allowance for doubtful accounts is assessed primarily on analysis of overdue aging and future expectations of customer payments. Bad debts are written off when incurred.

### 3.7 Inventories

Inventories are stated at the lower of cost or net realisable value.

Cost is calculated using the weighted average cost principle, and comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. In the case of manufactured inventories and work-in-progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.

Provision is made for obsolete and slow-moving of finished goods, factory supplies and spare parts based on the items that are obsoleted and expected to be unsalable.

### 3.8 Investments

#### *Investments in subsidiaries, joint ventures and associates*

Investments in subsidiaries, joint ventures and associates in the separate financial statements of the Company are accounted for using the cost method. Investments in joint ventures and associates in the consolidated financial statements are accounted for using the equity method.

*Investments in other debt securities and equity securities*

Debt securities that the Group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are stated at amortised cost, less any impairment losses. The difference between the acquisition cost and redemption value of such debt securities is amortised using the effective interest rate method over the period to maturity.

Debt securities and marketable equity securities, other than those securities held for trading or intended to be held to maturity, are classified as available-for-sale investments. Available-for-sale investments are, subsequent to initial recognition, stated at fair value, and changes therein, other than impairment losses and foreign currency differences on available-for-sale monetary items, are recognised directly in equity. Impairment losses and foreign exchange differences are recognised in profit or loss. When these investments are derecognised, the cumulative gain or loss previously recognised directly in equity is recognised in profit or loss. Where these investments are interest-bearing, interest calculated using the effective interest method is recognised in profit or loss.

Equity securities which are not marketable are stated at cost less any impairment losses.

The fair value of financial instruments classified as available-for-sale is determined as the quoted bid price at the reporting date.

*Disposal of investments*

On disposal of an investment, the difference between net disposal proceeds and the carrying amount together with the associated cumulative gain or loss that was reported in equity is recognised in profit or loss.

If the Group disposes of part of its holding of a particular investment, the deemed cost of the part sold is determined using the weighted average method applied to the carrying value of the total holding of the investment.

### 3.9 Investment properties

Property that is held for long-term rental yields or for capital appreciation or both, and that is not occupied by the companies in the consolidated Group, is classified as investment properties.

Investment properties of the Group are land and buildings held for long-term rental yields or for capital appreciation.

Investment properties are measured initially at its cost, including related transaction costs and borrowing costs. Borrowing costs incurred for the purpose of acquiring, constructing or producing a qualifying investment properties are capitalised as part of its cost.

After initial recognition, investment properties are carried at cost less accumulated depreciation and accumulated impairment losses.

Land is not depreciated. Depreciation on other investment properties which are buildings is calculated using the straight line method to allocate their cost to their residual values over their estimated useful live for 20 years.

Subsequent expenditure is capitalised to the asset's carrying amount only when it is probable that future economic benefits associated with the expenditure will flow to the Group and the cost of the item can be measured reliably. All other repairs and maintenance costs is expensed when incurred. When part of an investment property is replaced, the carrying amount of the replaced part is derecognised.

### 3.10 Property, plant and equipment

*Recognition and measurement*

*Owned assets*

Land are stated at cost less allowance for impairment.

Plant and equipment are measured at cost less accumulated depreciation and accumulated impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the assets to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located, and capitalised borrowing costs. Cost also may include transfers from other comprehensive income of any gain or loss on qualifying cash flow hedges of foreign currency purchases of property, plant and equipment. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Any gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and are recognised in profit or loss.

#### *Leased assets*

Leases in terms of which the Group substantially assumes all the risk and rewards of ownership are classified as finance leases. Property, plant and equipment acquired by way of finance leases are capitalised at the lower of their fair value and the present value of the minimum lease payments at the inception of the lease, less accumulated depreciation and impairment losses. Lease payments are apportioned between the finance charges and reduction of the lease liability so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are charged directly to the profit or loss.

#### *Subsequent costs*

The cost of replacing a part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group, and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

#### *Depreciation*

Depreciation on other assets is calculated based on the depreciable amount, which is the cost of an asset, or other amount substituted for cost, less its residual value.

Depreciation is charged to profit or loss on a straight-line basis over the estimated useful lives of each component of an item of assets. The estimated useful lives are as follows:

Land improvement	5-30 years
Plant, machinery, equipment and factory tools	5-40 years
Buildings and buildings improvement	5-30 years
Furniture, fixtures and office equipment	3-10 years
Vehicles	5-25 years

No depreciation is provided on assets under construction.

Depreciation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

### 3.11 Intangible assets

#### *Goodwill*

Goodwill that arises upon the acquisition of businesses is included in intangible assets. Subsequent to initial recognition, goodwill is measured at cost less accumulated impairment losses.

Goodwill in investment in joint ventures and associates is included in the carrying amount of the investment in joint ventures and associates, impairment loss on such an investment is deducted directly in investment in joint ventures and associates.

*Other intangible assets*

Other intangible assets that are acquired by the Group and have finite useful lives are measured at cost less accumulated amortisation and accumulated impairment losses.

*Subsequent expenditure*

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, are recognised in profit or loss as incurred.

*Amortisation*

Amortisation is based on the cost of the asset less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets, other than goodwill and trademark, from the date that they are available for use, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. The estimated useful lives are as follows:

Production licence fees	10-30	years
Computer software	3-10	years
Customer contracts and the related customer relationships	5	years
Right to use - pipe rack	6-15	years
Right to use - others	3-16	years

Amortisation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

### 3.12 Impairment

The carrying amounts of the Group's assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, the assets' recoverable amounts are estimated. For goodwill and intangible assets that have indefinite useful lives or are not yet available for use, the recoverable amount is estimated each year at the same time.

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. The impairment loss is recognised in profit or loss.

When a decline in the fair value of an available-for-sale financial asset has been recognised directly in equity and there is objective evidence that the value of the asset is impaired, the cumulative loss that had been recognised directly in equity is recognised in profit or loss even though the financial asset has not been derecognised. The amount of the cumulative loss that is recognised in profit or loss is the difference between the acquisition cost and current fair value, less any impairment loss on that financial asset previously recognised in profit or loss.

*Calculation of recoverable amount*

The recoverable amount of held-to-maturity securities carried at amortised cost is calculated as the present value of the estimated future cash flows discounted at the original effective interest rate.

The recoverable amount of available-for-sale financial assets is calculated by reference to the fair value.

The recoverable amount of a non-financial asset is the greater of the asset's value in use and fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For an asset that does not generate cash inflows largely independent of those from other assets, the recoverable amount is determined for the cash-generating unit to which the asset belongs.

*Reversals of impairment*

An impairment loss in respect of a financial asset is reversed if the subsequent increase in recoverable amount can be related objectively to an event occurring after the impairment loss was recognised in profit or loss.

An impairment loss in respect of goodwill is not reversed.

Impairment losses recognised in prior periods in respect of other non-financial assets are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

3.13 Interest-bearing liabilities

Interest-bearing liabilities are recognised initially at fair value less attributable transaction charges. Subsequent to initial recognition, interest-bearing liabilities are stated at amortised cost with any difference between cost and redemption value being recognised in profit or loss over the period of the borrowings on an effective interest basis.

3.14 Trade and other payables

Trade and other payables are stated at cost.

3.15 Employee benefits

*Defined contribution plans*

Obligations for contributions to defined contribution plans are expensed as the related service is provided.

*Defined benefit plans*

The Group's net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods, discounting that amount.

The calculation of defined benefit obligations is performed every 3 years by a qualified actuary using the projected unit credit method.

Remeasurements of the defined benefit liability, actuarial gain or loss are recognised immediately in Other comprehensive income. The Group determines the interest expense on the defined benefit liability for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period. Interest expense and other expenses related to defined benefit plans are recognised in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognised immediately in profit or loss. The Group recognises gains and losses on the settlement of a defined benefit plan when the settlement occurs.

*Other long-term employee benefits*

The Group's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognised in profit or loss in the period in which they arise.

*Termination benefits*

Termination benefits are expensed at the earlier of when the Group can no longer withdraw the offer of those benefits and when the Group recognises costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.

#### *Short-term employee benefits*

Short-term employee benefits are expensed as the related service is provided. A liability is recognised for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

#### 3.16 Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount on provisions is recognised as finance cost.

#### 3.17 Repurchase of share capital (treasury stock)

When share capital recognised as equity is repurchased, the amount of consideration paid, including directly attributable costs, is classified as treasury stock and recognised as a deduction from equity. An equal amount is appropriated from retained earnings and taken to a reserve for treasury stock within equity. When treasury stock are sold, the amount received is recognised as an increase in equity by crediting the cost of the treasury stock sold, calculated using the weighted average method, to the treasury stock account and transferring the equivalent amount back from treasury stock reserve to retained earnings. Surpluses on the sale of treasury stock are taken directly to a separate category within equity, 'Premium on treasury stock'. Net deficits on sale or cancellation of treasury stock are debited to retained earnings after setting off against any remaining balance of premium on treasury stock.

#### 3.18 Revenue

Revenue excludes value added taxes and is arrived at after deduction of trade discounts.

##### *Revenues from sale of goods and rendering of services*

Revenues from sale of goods is recognised when control of the goods has transferred to the customer, being at the point the goods are delivered to the customer. Revenues from rendering of services is recognised as a performance obligation satisfied at a point in time when services underlying the particular performance obligation is transferred to the customer or is recognised over time based on the stage of completion of the contract.

##### *Investment income*

Investment income consists of dividend income and interest income from investments and bank deposits. Dividend income is recognised in profit or loss on the date the Group's right to receive payments is established. Interest income is recognised on a time basis, based on the principle outstanding and the applicable interest rate.

##### *Other income*

Other income is recognised on an accrual basis.

#### 3.19 Finance costs

Finance costs is recognised using the effective interest method and comprise interest expense on borrowings, unwinding of the discount on provisions and contingent consideration.

Borrowing costs that are not directly attributable to the acquisition, construction or production of a qualifying asset are recognised in profit or loss using the effective interest method.

#### 3.20 Operating leases

Payments made under operating leases are recognised in profit or loss on a straight line basis over the term of the lease.

Contingent lease payments which the lease adjustment is confirmed are accounted for by revising the minimum lease payments over the remaining term of the lease.

### 3.21 Income tax

Income tax expense for the year comprises current and deferred tax. Current and deferred tax are recognised in profit or loss except to the extent that they relate to the items recognised in equity or are recognised in other comprehensive income.

Current tax is the expected tax payable or receivable on the taxable income for the year, using tax rates enacted at the end of the reporting period, and any adjustment to tax payable or receivable in respect of previous years.

Deferred tax is recognised in respect of temporary differences between the carrying amounts and taxable value of assets and liabilities, using tax rates enacted or substantively enacted to the temporary differences when they reverse.

Deferred tax is not recognised for the following temporary differences:

- the initial recognition of goodwill and related transactions
- the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss
- differences relating to investments in subsidiaries to the extent that it is probable that they will not reverse in the foreseeable future.

The measurement of deferred tax reflects the tax consequences that would follow the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

In determining the amount of current and deferred tax, the Group takes into account the impact of uncertain tax positions and whether additional taxes and interest may be due. The Group believes that its accruals for tax liabilities are adequate for all open tax years based on its assessment of many factors, including interpretations of tax law and prior experience. This assessment relies on estimates and assumptions and may involve a series of judgements about future events. New information may become available that causes the Group to change its judgement regarding the adequacy of existing tax liabilities; such changes to tax liabilities will impact tax expense in the period that such a determination is made.

Deferred tax assets and liabilities on different tax entities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority.

A deferred tax asset is recognised to the extent that it is probable that deferred tax assets can be utilised as future tax benefit. Deferred tax assets are reviewed at each reporting date and reduced to the extent that it is no longer probable that the related tax benefit will be realised.

### 3.22 Basic earnings (loss) per share

Basic earnings (loss) per share ("EPS") is calculated by dividing net profit (loss) for the year attributable to owners of the parent by the weighted average number of ordinary shares outstanding during the year, adjusted for treasury shares.

### 3.23 Financial information by segment

Segment results that are reported to the Group's Management Committee (the chief operating decision maker) include items directly attributable to a segment as well as those that can be allocated on a reasonable basis.

### 3.24 Measurement of fair values

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial assets and liabilities.

When measuring the fair value of an asset or a liability, the Group uses observable market data as far as possible. Fair values are categorised into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or liability might be categorised in different levels of the fair value hierarchy, then the fair value measurement is categorised in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

Further information about the assumptions made in measuring fair values is included in note 14: Investment properties and note 38: Financial instruments.

### 3.25 Use of management's judgments

The preparation of financial statements in conformity with TFRS requires the Company's management to exercise judgments in order to determine the accounting policies, estimates and various assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Although these estimates are based on management's reasonable consideration of current events, actual results may differ from these estimates.

## 4. EXPENSES FROM RAW MATERIALS DEROGATION

As the raw materials used in the production process are the volatile commodity materials, Global Green Chemical Public Company Limited which is a subsidiary of the Group, has policy to manage inventory to be at an appropriate level in order to mitigate the impacts from raw material price volatility. During second quarter of 2018, the subsidiary found that the quantity of raw materials recorded in the system was higher than actual quantity stored at the suppliers' facilities. In addition, this also includes the case that the subsidiary delivered the raw materials to the supplier for refining, however, the supplier neither returned back the refining products according to the contract nor the raw materials to the subsidiary.

The subsidiary conducted an in-depth investigation and found the misconduct among certain suppliers and some employees in the relevant functions of the subsidiary, in which certain suppliers are related. The subsidiary had already taken legal actions against involved parties (both external and internal) as well as the disciplinary actions against every involved employees.

In consequence, the Group recognised expenses from raw materials derogation in the consolidated statements of income for the year ended December 31, 2018 amounting to Baht 2,004 million (owners of the parent net of tax amounting to Baht 1,261 million). However, the subsidiary is legally entitled to claim from those involved.

The subsidiary was informed by the third party who received the transfer of claim from the supplier of the subsidiary for the payment of raw materials, which the supplier of the subsidiary borrowed from the third party to purchase raw materials to sell to the subsidiary and the subsidiary had to pay for the raw materials to that third party under the transfer of right for the payment of raw materials. After reviewing the provided documents, the subsidiary informed to the third party that these documents were not in the system, nor there was no evidence regarding the delivery of raw materials as prescribed in the documents. Subsequently, on August 20, 2018, the third party filed a civil lawsuit against the supplier of the subsidiary and the subsidiary as joint defendants for violation of loan agreement and transfer of claim, with damage claimed amounting to Baht 308.75 million with interest rate at 15% per annum amounting to Baht 15.90 million, totalling Baht 324.65 million. The subsidiary appointed a lawyer and filed a statement of defense. Currently, this case is in the process of the plaintiffs and defendants witness hearing. However, the legal advisor of the subsidiary provided an opinion that the subsidiary is not liable for any damages as per the plaint as there was no evidence regarding the delivering of raw materials to the subsidiary. As a result, there is no obligation.



On January 31, 2019, the subsidiary has entered into the settlement agreements with some suppliers in order to get compensate from those suppliers for the raw materials derogation which requires suppliers to deliver the pending quantity of raw materials under the period specified in the agreements. Consequently, the suppliers gradually delivered the pending raw materials to the subsidiary during the year 2019 amounting to Baht 16 million. In addition, such suppliers registered a mortgage on land to the subsidiary with fair value of Baht 217 million. Consequently, the subsidiary reviewed the provision for expenses from raw materials derogation and reversed such provision amounting to Baht 233 million in the consolidated and separate statements of profit or loss for the year ended December 31, 2019.

Besides, on February 27, 2019, a financial institution filed a civil lawsuit against the supplier of the subsidiary, director of supplier of the subsidiary and the subsidiary as joint defendants for violation of credit limit agreement, sale of promissory notes, transfer of money, guarantee and forced mortgage, with damage claimed amounting to Baht 55.95 million and interest amounting to Baht 3.49 million, totalling Baht 59.44 million. Therefore, the subsidiary filed a statement of defense. On October 28, 2019, the plaintiff submitted the motion for permission to withdraw the pliant against the subsidiary and the Court granted such permission and struck the case out of the case-list of the Court.

## **5. ACQUISITION OF BUSINESSES**

On August 8, 2018, the Group entered into the Shares Purchase Agreement to acquire 74% share of Siam Mitsui PTA Company Limited, Purified Terephthalic Acid producer, and 74% share of Thai PET Resin Company Limited, Polyethylene Terephthalate resin producer, directly and indirectly, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. Subsequently on December 27, 2018, the Group completed the share acquisition of subsidiaries for a preliminary cash consideration of approximately Baht 4,123 million. The final purchase price was settled with the seller for an additional payment of approximately Baht 1,249 million, which already paid in March 2019.

Management believes that the acquisition is harmonised with the business strategy of the Company that intends to expand the downstream investment and increase market potential in polymer business to satisfy customer's need.

The purchase under this condition is in accordance with TFRS 3 Business Combinations, requires the recognition of assets, liabilities and contingent liabilities acquired at the acquisition date at fair value. The Group is in process of hiring an independent appraiser to determine the fair value of assets and liabilities acquired during the measurement period, which must not exceed one year from the acquisition date to reflect new information obtained about facts and circumstances that existed as of the acquisition date. Accordingly, the fair value of assets acquired and liabilities assumed have been provisionally determined at the acquisition date (the value of property, plant and equipment determined by independent assets appraiser).

However, the fair value of assets acquired and liabilities have been already completed. Therefore, the fair value of assets acquired and liabilities have been adjusted and a gain on bargain purchase of Baht 31 million has been recognised in the consolidated income statement for the year ended December 31, 2019.

The following summarises the major classes of consideration transferred, and the recognised amounts of assets acquired and liabilities assumed at the acquisition date:

Identifiable assets acquired and liabilities assumed as at December 31, 2018:

	<i>Notes</i>	<b>Fair values (in million Baht)</b>
Cash and cash equivalents		1,589
Trade receivables		2,481
Inventories		2,201
Property, plant and equipment	15	9,549
Intangible assets	18	8
Trade payables		(2,777)
Other payables		(183)
Long-term borrowings from financial institutions		(750)
Deferred tax	19	(584)
Other assets/(liabilities), net		(2,444)
<b>Net identifiable assets acquired and liabilities assumed</b>		<b>9,090</b>
Non-controlling interest acquired		(2,363)
<b>Net assets acquired and liabilities assumed</b>		<b>6,727</b>
Gain on bargain purchase		(1,355)
<b>Total consideration</b>		<b>5,372</b>
Cash acquired		(1,589)
<b>Net consideration</b>		<b>3,783</b>

*Acquisition-related costs*

The Group incurred acquisition-related costs of Baht 110 million related to external legal fees and due diligence costs. The legal fees and due diligence costs have been included in administrative expenses in the Group's consolidated statement of income in the period which transaction occurred.

**6. CASH AND CASH EQUIVALENTS**

6.1 Cash and cash equivalents as at December 31, 2019 and 2018 consist of:

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>	<u>financial statements</u>	<u>financial statements</u>	<u>financial statements</u>
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Cash on hand	2	76	2	2
Cash and highly liquid current investments (Private funds)	62	533	62	533
Cash at banks - current accounts	822	1,679	5	4
Cash at banks - savings accounts	13,091	16,037	9,283	10,978
Cash at banks - foreign accounts	2,321	1,624	1,546	322
Highly liquid current investments	2,542	16,795	1,499	15,303
<b>Total</b>	<b>18,840</b>	<b>36,744</b>	<b>12,397</b>	<b>27,142</b>

As at December 31, 2019 and 2018, bank accounts of two subsidiaries totalling Baht 60 million and Baht 192 million, respectively, are pledged as collateral to secure credit facilities obtained from financial institutions. However, the pledged bank accounts can be withdrawn in accordance with the objective and conditions stipulated in the loan agreements for use as working capital required in the normal course of business (see Note 20).

6.2 Non-cash transactions:

Reconciliation of liabilities arising from financing activities

The table below details changes in the liabilities arising from financing activities, including both cash and non-cash changes.

As at December 31, 2019

Unit : Million Baht

	Consolidated financial statements									
	Balance as at January 1, 2019	Net financing cash flows	Non-cash changes						Others	Balance as at December 31, 2019
Interest expense			Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in finance lease liabilities	Amortisation of deferred interest from finance lease	Gain on exchange rate			
Accrued interest expense	706	(2,918)	3,637	(658)	93	-	-	(14)	-	846
Finance lease liabilities	320	(176)	-	-	-	250	7	-	-	401
Short-term borrowings from financial institutions	3,343	(1,281)	-	-	-	-	-	(41)	-	2,021
Long-term borrowings from financial institutions	37,962	(2,847)	-	-	39	-	-	(552)	24	34,626
Long-term borrowings from other parties	1,252	(27)	-	-	3	-	-	(71)	(847)	310
Debentures	54,350	18,058	-	-	47	-	-	(2,324)	-	70,131
<b>Total</b>	<b>97,933</b>	<b>10,809</b>	<b>3,637</b>	<b>(658)</b>	<b>182</b>	<b>250</b>	<b>7</b>	<b>(3,002)</b>	<b>(823)</b>	<b>108,335</b>

As at December 31, 2018

Unit : Million Baht

	Consolidated financial statements									
	Balance as at January 1, 2018	Net financing cash flows	Non-cash changes						Gain on exchange rate	Balance as at December 31, 2018
Interest expense			Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in finance lease liabilities	Amortisation of deferred interest from finance lease	Effect from acquisition of subsidiaries			
Accrued interest expense	726	(3,403)	3,582	(295)	97	-	-	2	(3)	706
Finance lease liabilities	313	(153)	-	-	-	153	7	-	-	320
Short-term borrowings from financial institutions	263	135	-	-	-	-	-	2,955	(10)	3,343
Long-term borrowings from financial institutions	41,113	(3,630)	-	-	67	-	-	750	(338)	37,962
Long-term borrowings from other parties	1,810	(619)	-	-	89	-	-	-	(28)	1,252
Debentures	54,645	(82)	-	-	(129)	-	-	-	(84)	54,350
<b>Total</b>	<b>98,870</b>	<b>(7,752)</b>	<b>3,582</b>	<b>(295)</b>	<b>124</b>	<b>153</b>	<b>7</b>	<b>3,707</b>	<b>(463)</b>	<b>97,933</b>

As at December 31, 2019

Unit : Million Baht

	Separate financial statements								Balance as at December 31, 2019
	Balance as at January 1, 2019	Net financing cash flows	Non-cash changes					Gain on exchange rate	
			Interest expense	Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in finance lease liabilities	Amortisation of deferred interest from finance lease		
Accrued interest expense	715	(2,449)	2,851	(280)	26	-	-	-	863
Finance lease liabilities	226	(122)	-	-	-	180	5	-	289
Short-term borrowings from related parties	1,931	1,110	-	-	-	-	-	-	3,041
Long-term borrowings from financial institutions	14,419	(4,280)	-	-	5	-	-	(71)	10,073
Long-term borrowing from a related party	16,105	-	-	-	18	-	-	(1,132)	14,991
Debentures	38,321	18,058	-	-	(7)	-	-	(1,151)	55,221
<b>Total</b>	<b>71,717</b>	<b>12,317</b>	<b>2,851</b>	<b>(280)</b>	<b>42</b>	<b>180</b>	<b>5</b>	<b>(2,354)</b>	<b>84,478</b>

As at December 31, 2018

Unit : Million Baht

	Separate financial statements								Balance as at December 31, 2018
	Balance as at January 1, 2018	Net financing cash flows	Non-cash changes					(Gain)/loss on exchange rate	
			Interest expense	Interest expense capitalised as part of fixed assets	Amortisation of deferred financing fees	Increase in finance lease liabilities	Amortisation of deferred interest from finance lease		
Accrued interest expense	698	(2,887)	3,018	(192)	78	-	-	-	715
Finance lease liabilities	221	(122)	-	-	-	123	4	-	226
Short-term borrowings from related parties	2,558	(627)	-	-	-	-	-	-	1,931
Long-term borrowings from financial institutions	21,259	(6,793)	-	-	5	-	-	(52)	14,419
Long-term borrowing from a related party	-	16,473	-	-	(68)	-	-	(300)	16,105
Debentures	54,645	(16,453)	-	-	83	-	-	46	38,321
<b>Total</b>	<b>79,381</b>	<b>(10,409)</b>	<b>3,018</b>	<b>(192)</b>	<b>98</b>	<b>123</b>	<b>4</b>	<b>(306)</b>	<b>71,717</b>

7. TRADE RECEIVABLES

Trade receivables as at December 31, 2019 and 2018 consist of:

	<i>Note</i>	Unit : Million Baht			
		<u>Consolidated</u>		<u>Separate</u>	
		<u>financial statements</u>		<u>financial statements</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Related parties	27	16,721	17,601	22,433	25,708
Other parties		17,485	24,433	5,705	9,144
<b>Total</b>		<b>34,206</b>	<b>42,034</b>	<b>28,138</b>	<b>34,852</b>
<u>Less</u> Allowance for doubtful accounts		(49)	(43)	(19)	(19)
<b>Total trade receivables</b>		<b>34,157</b>	<b>41,991</b>	<b>28,119</b>	<b>34,833</b>

Trade receivables as at December 31, 2019 and 2018 are classified by aging as follows:

		Unit : Million Baht			
		<u>Consolidated</u>		<u>Separate</u>	
		<u>financial statements</u>		<u>financial statements</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Related parties</b>					
Within credit terms		16,705	17,579	22,428	25,271
Overdue					
- less than 3 months		16	21	5	437
- over 3 months but less than 6 months		-	1	-	-
- over 6 months but less than 12 months		-	-	-	-
- over than 12 months		-	-	-	-
<b>Total trade receivables, related parties</b>		<b>16,721</b>	<b>17,601</b>	<b>22,433</b>	<b>25,708</b>
<b>Other parties</b>					
Within credit terms		16,980	23,798	5,684	9,125
Overdue					
- less than 3 months		453	589	2	-
- over 3 months but less than 6 months		8	2	-	-
- over 6 months but less than 12 months		6	7	-	-
- over than 12 months		38	37	19	19
		17,485	24,433	5,705	9,144
<u>Less</u> Allowance for doubtful accounts		(49)	(43)	(19)	(19)
<b>Total trade receivables, other parties</b>		<b>17,436</b>	<b>24,390</b>	<b>5,686</b>	<b>9,125</b>
<b>Total trade receivables</b>		<b>34,157</b>	<b>41,991</b>	<b>28,119</b>	<b>34,833</b>

The normal credit term granted by the Group ranges from 14 days to 90 days.

**8. OTHER RECEIVABLES**

Other receivables as at December 31, 2019 and 2018 consist of:

	<b>Consolidated</b>		<b>Unit : Million Baht</b>	
	<b>financial statements</b>		<b>Separate</b>	
	<b>2019</b>	<b>2018</b>	<b>2019</b>	<b>2018</b>
Prepaid expenses	1,358	1,503	747	947
Receivable from oil hedging contracts	417	436	417	436
Accrued income	216	488	305	560
Other receivables	579	693	578	697
Receivable from The Revenue Department	367	117	222	-
Others	212	388	46	137
<b>Total</b>	<b>3,149</b>	<b>3,625</b>	<b>2,315</b>	<b>2,777</b>

**9. INVENTORIES**

Inventories as at December 31, 2019 and 2018 consist of:

	<b>Consolidated</b>		<b>Unit : Million Baht</b>	
	<b>financial statements</b>		<b>Separate</b>	
	<b>2019</b>	<b>2018</b>	<b>2019</b>	<b>2018</b>
Finished goods	14,078	15,551	9,405	10,574
Work in progress	1,618	1,823	992	1,266
Raw materials	9,387	8,870	8,095	7,147
Factory supplies and spare parts	10,406	9,992	8,113	7,834
Goods in transit	1,221	4,750	49	3,701
<b>Total</b>	<b>36,710</b>	<b>40,986</b>	<b>26,654</b>	<b>30,522</b>
<u>Less</u> Allowance for decline in value	(303)	(1,366)	(240)	(1,330)
Allowance for obsolescence	(155)	(254)	(33)	(87)
<b>Net</b>	<b>36,252</b>	<b>39,366</b>	<b>26,381</b>	<b>29,105</b>
Inventories recognised as an expense in 'cost of sales of goods':				
- Cost	389,752	462,756	339,857	416,495
- (Reversal of) write-down to net realisable value	(1,061)	1,347	(1,090)	1,330
<b>Net</b>	<b>388,691</b>	<b>464,103</b>	<b>338,767</b>	<b>417,825</b>

As at December 31, 2019 and 2018, the Company's inventories included petroleum legal reserve of 302 million liters with approximated value of Baht 4,072 million and 341 million liters with approximated value of Baht 4,752 million, respectively.

**10. INVESTMENTS IN SUBSIDIARIES**

Movements of investments in subsidiaries for the years ended December 31, were as follows:

	<b>Unit : Million Baht</b>	
	<b>Separate</b>	
	<b>2019</b>	<b>2018</b>
<i>Subsidiaries</i>		
As at January 1,	67,783	56,859
Acquisition	4,833	11,694
Capital distribution	(2)	(41)
Allowance for impairment	(63)	(729)
<b>As at December 31,</b>	<b>72,551</b>	<b>67,783</b>

Investments in subsidiaries as at December 31, 2019 and 2018, and dividend income for the years ended December 31, 2019 and 2018 were as follows:

Subsidiaries	Separate financial statements												Unit : Million Baht	
	Ownership		Paid-up capital		Cost		Impairment		At cost-net		Fair value of listed securities		Dividend income	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Global Green Chemicals Plc.	72	72	10,237	10,237	7,400	7,400	-	-	7,400	7,400	9,324	7,289	111	148
GC Glycol Co., Ltd.	100	100	5,395	5,395	5,395	5,395	-	-	5,395	5,395	-	-	432	1,079
GC Polyols Co., Ltd.	82	82	2,692	1,281	2,210	1,052	-	-	2,210	1,052	-	-	-	-
GC Marketing Solutions Co., Ltd.	99	99	40	40	451	451	-	-	451	451	-	-	40	21
GC Maintenance and Engineering Co., Ltd.	100	100	137	137	155	155	-	-	155	155	-	-	128	-
GC Logistics Solutions Co., Ltd.	99	99	1,200	1,200	1,607	1,607	-	-	1,607	1,607	-	-	30	-
GC Ventures Co., Ltd.	100	100	465	144	465	144	-	-	465	144	-	-	-	-
GC Treasury Center Co., Ltd.	100	100	10	10	10	10	-	-	10	10	-	-	-	-
GC Styrenics Co., Ltd.	100	100	190	190	190	190	-	-	190	190	-	-	-	-
GC Oxirane Co., Ltd.	100	100	5,267	2,392	5,267	2,392	-	-	5,267	2,392	-	-	-	-
GC-M PTA Company Limited (Formerly Siam Mitsui PTA Co., Ltd.)	49	49	4,800	4,800	2,903	2,903	-	-	2,903	2,903	-	-	-	-
GC Estate Co., Ltd.	100	100	7,200	7,200	7,200	7,200	-	-	7,200	7,200	-	-	-	-
Solution Creation Co., Ltd.	100	100	524	183	524	183	-	-	524	183	-	-	-	-
Thai Tank Terminal Limited	51	51	900	900	459	459	-	-	459	459	-	-	535	542
Bio Spectrum Co., Ltd. (Liquidation process finalized in January 2019)	-	100	-	146	-	96	-	(95)	-	1	-	-	-	-
PTT Phenol Co., Ltd.	100	100	11,851	11,851	13,155	13,155	-	-	13,155	13,155	-	-	1,390	1,122
Auria Bio Chemicals Co., Ltd. (Liquidation process finalized in April 2019)	-	54	-	90	-	8	-	(7)	-	1	-	-	-	-
NPC Safety and Environmental Service Co., Ltd.	100	100	165	165	165	165	-	-	165	165	-	-	-	-
PTTGC America Corporation	100	100	-	-	4,407	4,361	-	-	4,407	4,361	-	-	-	-
PTTGC International Private Limited	100	100	30,877	30,785	30,877	30,785	(10,289)	(10,226)	20,588	20,559	-	-	-	-
<b>Total investments in subsidiaries</b>					<b>82,840</b>	<b>78,111</b>	<b>(10,289)</b>	<b>(10,328)</b>	<b>72,551</b>	<b>67,783</b>	<b>9,324</b>	<b>7,289</b>	<b>2,666</b>	<b>2,192</b>

*Change in investments in subsidiaries*

On March 14, 2019, Solution Creation Co., Ltd. has called for paid-up capital from the capital increase from the Company following the Extraordinary General Meeting of shareholders of the subsidiary held on January 11, 2019 to invest in Revolve Group Limited at Baht 340.90 million, of which received in March 2019.

On May 8, 2019, PTTGC International Private Limited has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on April 29, 2019 for the purpose of corporate and its subsidiary operation at SGD 3.92 million or equivalent to Baht 91.89 million, of which fully received in May 2019.

On August 28, 2019, PTTGC America Corporation has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on July 15, 2016 for the purpose of US Petrochemical Complex Project investment at USD 1.50 million or equivalent to Baht 46.24 million, of which fully received in September 2019.

During the year ended December 31, 2019, GC Ventures Co., Ltd. has called for paid-up capital from the capital increase by the Annual General Meeting of shareholders of the subsidiary held on March 25, 2019, for investment in Corporate Venture Capital (CVC) at Baht 320.76 million, of which fully received during the year ended December 31, 2019.

During the year ended December 31, 2019, GC Polyols Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on November 14, 2018 for conducting a Polyols & PU System Project at Baht 1,158.12 million, of which fully received during the year ended December 31, 2019.

During the year ended December 31, 2019, GC Oxirane Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on October 5, 2017 for conducting a Propylene Oxide Project at Baht 2,875.60 million, of which fully received during the year ended December 31, 2019.

On January 7, 2019, Bio Spectrum Co., Ltd. distributed capital to the Company amounting to Baht 1.40 million. On March 31, 2016, such subsidiary registered the dissolution with Department of Business Development, Ministry of Commerce and finalized the liquidation process on January 18, 2019.

On March 26, 2019, Auria BioChemicals Co., Ltd. distributed capital to the Company amounting to Baht 0.52 million. On April 25, 2018, such subsidiary registered the dissolution with Department of Business Development, Ministry of Commerce and finalized the liquidation process on April 4, 2019.

On January 11, 2018, Solution Creation Co., Ltd. has called for paid capital from the capital increase by the Extraordinary General Meeting of shareholders of the subsidiary held on September 4, 2017 to invest in TPBI & Myanmar Star Co., Ltd. at Baht 16.75 million, of which fully received in January 2018.

At the Board of Directors' Meeting of the Company held on December 18, 2017, the Board approved to establish GC Estate Co., Ltd. which is 100% shareholding by the Company, for developing estate for rent to invest in petrochemical and related industries. Subsequently on January 23, 2018, GC Estate Co., Ltd. registered the initial authorised share capital of Baht 1.01 million and called for paid-up capital of 10,100 shares at Baht 100 per share, totalling Baht 1.01 million, of which fully received in January 2018. Subsequently, at the Annual General Meeting of shareholders of the subsidiary held on March 21, 2018, the shareholders approved to increase the registered capital to Baht 1,300 million and called for paid-up capital of 12.99 million shares at Baht 100 per share, totalling Baht 1,298.99 million, of which fully received in March 2018. Subsequently, at the Extraordinary General Meeting of shareholders of the subsidiary held on June 20, 2018, the shareholders approved to increase the registered capital to Baht 7,200 million and called for paid-up capital of 59 million shares at Baht 100 per share, totalling Baht 5,900 million, of which fully received in June 2018.

On March 22, 2018, GC Treasury Center Co., Ltd. has called for paid capital from the capital increase by the Annual General Meeting of shareholders of the subsidiary held on March 21, 2018 at 75,000 shares, Baht 100 per share, totalling Baht 7.50 million, of which fully received in January 2018.



At the Board of Directors' Meeting of the Company held on May 21, 2018, the Board approved to establish GC Ventures Co., Ltd. ("GCV") for investment in Corporate Venture Capital (CVC) which is 100% owned by the Company. On May 22, 2018, GCV registered the initial authorised share capital of Baht 5 million and called for paid-up capital of 0.05 million shares at Baht 100 per share, totalling Baht 5 million, of which fully received in May 2018. Subsequently, at the Annual General Meeting of shareholders of the subsidiary held on June 8, 2018, the shareholders approved to increase the registered capital to Baht 144 million and called for paid-up capital of 1.39 million shares at Baht 100 per share, totalling Baht 139 million, of which fully received in June 2018.

On August 31, 2018, PTTGC International Private Limited has called for paid capital from the capital increase by the Board of Directors' Meeting held on November 20, 2009 for the purpose of corporate and its subsidiary operation at SGD 1.12 million or equivalent to Baht 27.15 million, of which fully received in August 2018.

On November 8, 2018, GC Oxirane Co., Ltd. has called for paid capital from the capital increase by the Board of Directors' Meeting held on May 22, 2017 for conducting a Propylene Oxide Project at Baht 179.73 million, of which fully received in December 2018.

On August 8, 2018, the Company and a subsidiary entered into the Shares Purchase Agreement to acquire 74% share (49% direct interest and 25% indirect interest) of Siam Mitsui PTA Company Limited, Purified Terephthalic Acid producer, and 74% share (74% indirect interest) of Thai PET Resin Company Limited, Polyethylene Terephthalate resin producer, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. Subsequently on December 27, 2018, the Group completed the share acquisition of subsidiaries for a preliminary cash consideration of approximately Baht 4,123 million. The final purchase price was settled with the seller for an additional payment of approximately Baht 1,249 million, which was paid in March 2019.

During the year ended December 31, 2018, PTTGC International Private Limited has called for paid-up capital from the capital increase by the Board of Directors' Meeting held on December 18, 2017 to invest in PTTGC Innovation America Corp. at USD 25 million or equivalent to Baht 790.71 million, to finance the loan prepayment in order to reduce the Group's finance cost and for subsidiary operation, of which fully received during the year ended December 31, 2018.

During the year ended December 31, 2018, GC Polyols Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on May 22, 2017 for conducting a Polyols & PU System Project at Baht 425.69 million, of which fully received during the year ended December 31, 2018.

On April 25, 2018, Auria BioChemicals Co., Ltd. which is a subsidiary of the Company registered the dissolution with Department of Business Development, Ministry of Commerce. Subsequently on December 19, 2018, Auria BioChemicals Co., Ltd. distributed capital to the Company amounting to Baht 40.77 million. As at December 31, 2018, the aforementioned subsidiary is in the liquidation process.

#### *Impairment loss on investment in a subsidiary*

During the year ended December 31, 2019, the Company recognised impairment loss on the investment in PTTGC International Private Limited totalling Baht 63.05 million in the separate financial statements as the recoverable amount of investment in PTTGC Innovation America Corp. was less than its carrying amount.

During the year ended December 31, 2018, the Company recognised impairment loss on the investment in PTTGC International Private Limited totalling Baht 729.56 million in the separate financial statements. Impairment loss Baht 727.65 million as the recoverable amount of investment in PTTGC Innovation America Corp. was less than its carrying amount. Impairment loss on investment resulted from the capital increase to finance the loan prepayment in order to reduce the Group's finance cost and impairment loss Baht 1.91 million as the recoverable amount of investment in PTT Chemical International (Asia Pacific ROH) Limited ("AP ROH") was less than its carrying amount due to the dissolution of AP ROH. On November 30, 2016, AP ROH registered the dissolution with Department of Business Development, Ministry of Commerce. AP ROH has finalized the liquidation process on November 30, 2018.

**11. INVESTMENTS IN JOINT VENTURES**

Movements of investments in joint ventures for the years ended December 31, were as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Joint ventures</b>				
As at January 1,	30,758	27,577	15,373	15,373
Acquisitions	794	-	-	-
Share of profit of investments in joint ventures	2,626	5,209	-	-
Share of other comprehensive loss of joint ventures	(532)	(374)	-	-
Effect from translation differences on foreign investment	165	-	-	-
Dividend income	(1,367)	(1,654)	-	-
<b>As at December 31,</b>	<b><u>32,444</u></b>	<b><u>30,758</u></b>	<b><u>15,373</u></b>	<b><u>15,373</u></b>

Investments in joint ventures as at December 31, 2019 and 2018, and dividend income for the years ended December 31, 2019 and 2018 were as follows:

Unit : Million Baht

<u>Consolidated financial statements</u>														
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Equity method</u>		<u>Impairment</u>		<u>Equity method - net</u>		<u>Dividend income</u>	
	<u>Interest (%)</u>		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
	<u>2019</u>	<u>2018</u>												
<i>Direct joint ventures</i>														
PTT Asahi Chemical Co., Ltd.	50	50	13,819	13,819	996	996	10,878	9,569	-	-	10,878	9,569	-	-
PTT MCC Biochem Co., Ltd.	50	50	1,860	1,860	160	160	168	206	-	-	168	206	-	-
HMC Polymers Co., Ltd.	41	41	3,790	3,790	14,217	14,217	12,337	12,885	-	-	12,337	12,885	828	1,242
					<u>15,373</u>	<u>15,373</u>	<u>23,383</u>	<u>22,660</u>	<u>-</u>	<u>-</u>	<u>23,383</u>	<u>22,660</u>	<u>828</u>	<u>1,242</u>
<i>Indirect joint ventures</i>														
Thai Ethoxylate Co., Ltd.	50	50	420	420	210	210	585	736	-	-	585	736	223	91
Emery Oleochemicals (M) Sdn. Bhd.	50	50	4,530	4,530	4,966	4,966	4,495	4,519	-	-	4,495	4,519	-	-
Emery Specialty Chemicals Sdn. Bhd.	50	50	818	818	407	407	-	-	-	-	-	-	-	-
Nature Works LLC	50	50	43,167	43,167	4,793	4,793	3,274	2,843	-	-	3,274	2,843	316	321
GGC KTIS Bioindustrial Company Limited	50	-	1,048	-	524	-	512	-	-	-	-	-	-	-
Revolve Group Limited	49	-	3	-	270	-	195	-	-	-	-	-	-	-
					<u>11,170</u>	<u>10,376</u>	<u>9,061</u>	<u>8,098</u>	<u>-</u>	<u>-</u>	<u>9,061</u>	<u>8,098</u>	<u>539</u>	<u>412</u>
<b>Total investments in joint ventures</b>					<u>26,543</u>	<u>25,749</u>	<u>32,444</u>	<u>30,758</u>	<u>-</u>	<u>-</u>	<u>32,444</u>	<u>30,758</u>	<u>1,367</u>	<u>1,654</u>

Unit : Million Baht

<u>Separate financial statements</u>												
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Impairment</u>		<u>At cost - net</u>		<u>Dividend income</u>	
	<u>Interest (%)</u>											
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Joint ventures</i>												
PTT Asahi Chemical Co., Ltd.	50	50	13,819	13,819	996	996	-	-	996	996	-	-
PTT MCC Biochem Co., Ltd.	50	50	1,860	1,860	160	160	-	-	160	160	-	-
HMC Polymers Co., Ltd.	41	41	3,790	3,790	14,217	14,217	-	-	14,217	14,217	828	1,242
<b>Total investments in joint ventures</b>					<b>15,373</b>	<b>15,373</b>	<b>-</b>	<b>-</b>	<b>15,373</b>	<b>15,373</b>	<b>828</b>	<b>1,242</b>

*Joint ventures*

The following table summarises the financial information of the joint ventures as included in their own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarised financial information to the carrying amount of the Group's interest in these companies.

	<b><u>PTT Asahi</u></b> <b><u>Chemical Co., Ltd.</u></b>	<b>Unit : Million Baht</b> <b><u>HMC Polymers</u></b> <b><u>Co., Ltd.</u></b>
<b>For the year ended December 31, 2019</b>		
<b>Statement of profit or loss</b>		
Revenue	13,141	27,033
Depreciation and amortisation	(866)	(1,579)
Loss for the year	2,617	1,627
Other comprehensive loss	-	(951)
<b>Total comprehensive income for the year</b>	<b><u>2,617</u></b>	<b><u>676</u></b>
<b>As at December 31, 2019</b>		
<b>Statement of financial position</b>		
Current assets	5,158	7,510
Non-current assets	21,186	25,481
Current liabilities	(1,428)	(5,365)
Non-current liabilities	(3,160)	(5,186)
<b>Net assets</b>	<b><u>21,756</u></b>	<b><u>22,440</u></b>
Proportion of the Group's ownership interest in joint ventures (%)	<u>50.00</u>	<u>41.44</u>
	10,878	9,299
Investment amount over net asset at acquisition date	-	3,038
<b>Carrying amount of interest in investee</b>	<b><u>10,878</u></b>	<b><u>12,337</u></b>
<i>Remark:</i>		
Cash and cash equivalents	854	1,344

The reconciliation of the summarised financial information to the carrying amount of the Group's interest in these companies.

	<b><u>PTT Asahi</u></b> <b><u>Chemical Co., Ltd.</u></b>	<b>Unit : Million Baht</b> <b><u>HMC Polymers</u></b> <b><u>Co., Ltd.</u></b>
Group's interest in net assets of investee as at January 1, 2019	9,569	12,885
Total comprehensive income attributable to the Group	1,309	280
Dividends received during the year	-	(828)
<b>Carrying amount of interest in investee as at December 31, 2019</b>	<b><u>10,878</u></b>	<b><u>12,337</u></b>

*Immaterial joint ventures*

The summarised financial information for the Group's interest in immaterial joint ventures based on the amounts reported in the Group's consolidated financial statements:

	<b>Unit : Million Baht</b>
	<b><u>Immaterial</u></b>
	<b><u>joint ventures</u></b>
<b>For the year ended December 31, 2019</b>	
Carrying amount of interests in immaterial joint ventures	9,229
Group's share of:	
- Profit for the year	643
- Other comprehensive income	28
- Total comprehensive income for the year	671

*Change in investments in joint ventures*

On March 26, 2019, Solution Creation Co., Ltd., a subsidiary, acquired 49% of shares of Revolve Group Limited ("RGL") from previous shareholder and by subscription of newly issued shares of RGL. The subsidiary paid for the share purchase totalling pound sterling 6.4 million or equivalent to Baht 269.54 million according to Share Sale and Subscription Agreement. The investment is harmonised with the Company's business strategy that intends to expand the investment toward downstream and enhance the value chain of performance chemicals products.

On December 19, 2018, the Board of Directors' Meeting of the GGC Biochemicals Co., Ltd. ("GGC Bio"), an indirect subsidiary, approved to establish GGC KTIS Bioindustrial Company Limited ("GKBI") as a joint venture company in which share capital were held by GGC Bio as 50% and KTIS Bioethanol Company Limited as 50%. The purpose of the joint venture company is to invest in Nakhonsawan Biocomplex Project ("NBC"). On January 11, 2019, GKBI registered the establishment with registered capital of 10,000 shares at Baht 100 per share amounting to Baht 1 million and called for paid-up capital of 5,000 shares at Baht 100 per share, totalling Baht 0.50 million from GGC Bio. During the year ended December 31, 2019, GKBI registered for capital increase totalling 25,990,000 shares at Baht 100 per share amounting to Baht 2,599 million and called for paid-up capital of 2,645,000 shares at Baht 100 per share amounting to Baht 264.50 million with 10,350,000 shares at Baht 25 per share amounting to Baht 258.75 million from GGC Bio. GKBI had fully received such share subscription.

**12. INVESTMENTS IN ASSOCIATES**

Movements of investments in associates for the years ended December 31, were as follows:

	<b>Unit : Million Baht</b>			
	<b><u>Consolidated</u></b>		<b><u>Separate</u></b>	
	<b><u>financial statements</u></b>		<b><u>financial statements</u></b>	
	<b><u>2019</u></b>	<b><u>2018</u></b>	<b><u>2019</u></b>	<b><u>2018</u></b>
<b>Associates</b>				
As at January 1,	15,450	14,002	9,793	9,323
Acquisition	17,020	489	17,020	470
Disposal	(212)	-	-	-
Share of profit of investments in associates	1,933	1,686	-	-
Share of other comprehensive income (loss) of investments in associates	(385)	5	-	-
Effect from translation differences on foreign investment	(13)	-	-	-
Dividend income	(875)	(732)	-	-
Difference arising from the change in the ownership interest in an investment <sup>(1)</sup>	(3,408)	-	-	-
Interests in equity of associate	319	-	-	-
<b>As at December 31,</b>	<b><u>29,829</u></b>	<b><u>15,450</u></b>	<b><u>26,813</u></b>	<b><u>9,793</u></b>

Investments in associates as at December 31, 2019 and 2018, and dividend income for the years ended December 31, 2019 and 2018 were as follows:

Unit : Million Baht

	<u>Consolidated financial statements</u>													
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Equity method</u>		<u>Impairment</u>		<u>Equity method - net</u>		<u>Dividend income</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Direct associates</i>														
Global Power Synergy Plc.	23	23	28,197	14,983	22,753	5,934	22,599	8,756	-	-	22,599	8,756	443	426
Kuraray GC Advanced Materials Co., Ltd.	33	33	2,008	1,408	671	470	629	470	-	-	629	470	-	-
PTT Energy Solutions Co., Ltd.	20	20	150	150	30	30	42	48	-	-	42	48	-	-
PTT Digital Solutions Co., Ltd.	40	40	150	150	60	60	824	703	-	-	824	703	35	33
Vinythai Plc.	25	25	7,111	7,111	3,297	3,297	5,642	5,130	-	-	5,642	5,130	385	266
Eastern Fluid Transport Co., Ltd.	23	23	10	10	2	2	16	20	-	-	16	20	12	7
					<u>26,813</u>	<u>9,793</u>	<u>29,752</u>	<u>15,127</u>	<u>-</u>	<u>-</u>	<u>29,752</u>	<u>15,127</u>	<u>875</u>	<u>732</u>
<i>Indirect associates</i>														
PT. Indo Thai Trading	-	49	-	255	-	124	-	220	-	-	-	220	-	-
Thai Eastern Top Seeds Oil Co., Ltd.	30	30	222	222	67	67	28	57	-	-	28	57	-	-
S.P. Petpack Inter Group Co., Ltd.	25	25	200	200	50	50	49	46	-	-	49	46	-	-
					<u>117</u>	<u>241</u>	<u>77</u>	<u>323</u>	<u>-</u>	<u>-</u>	<u>77</u>	<u>323</u>	<u>-</u>	<u>-</u>
<b>Total investments in associates</b>					<u>26,930</u>	<u>10,034</u>	<u>29,829</u>	<u>15,450</u>	<u>-</u>	<u>-</u>	<u>29,829</u>	<u>15,450</u>	<u>875</u>	<u>732</u>

Unit : Million Baht

	<u>Separate financial statements</u>													
	<u>Ownership</u>		<u>Paid-up capital</u>		<u>Cost</u>		<u>Impairment</u>		<u>At cost - net</u>		<u>Fair value of listed securities</u>		<u>Dividend income</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Associates</i>														
Global Power Synergy Plc.	23	23	28,197	14,983	22,753	5,934	-	-	22,753	5,934	54,959	19,923	443	426
Kuraray GC Advanced Materials Co., Ltd.	33	33	2,008	1,408	671	470	-	-	671	470	-	-	-	-
PTT Energy Solutions Co., Ltd.	20	20	150	150	30	30	-	-	30	30	-	-	-	-
PTT Digital Solutions Co., Ltd.	40	40	150	150	60	60	-	-	60	60	-	-	35	33
Vinythai Plc.	25	25	7,111	7,111	3,297	3,297	-	-	3,297	3,297	7,475	5,921	385	266
Eastern Fluid Transport Co., Ltd.	15	15	10	10	2	2	-	-	2	2	-	-	8	5
<b>Total investments in associates</b>					<b>26,813</b>	<b>9,793</b>	<b>-</b>	<b>-</b>	<b>26,813</b>	<b>9,793</b>	<b>62,434</b>	<b>25,844</b>	<b>871</b>	<b>730</b>



*Associates*

The following table summarises the financial information of the associate as included in its own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarised financial information to the carrying amount of the Group's interest in the associate.

	<b>Unit : Million Baht</b> <b><u>Global Power</u></b> <b><u>Synergy Plc.</u></b>
<b>For the year ended December 31, 2019</b>	
<b>Statement of income</b>	
Revenue	65,789
Profit for the year	3,893
Other comprehensive loss	(1,452)
<b>Total comprehensive income for the year</b>	<b><u>2,411</u></b>
<b>As at December 31, 2019</b>	
<b>Statement of financial position</b>	
Current assets	38,760
Non-current assets	212,952
Current liabilities	(39,055)
Non-current liabilities	(103,949)
<b>Net assets</b>	<b><u>108,708</u></b>
Non-controlling interests	(9,283)
<b>Total attributions to owners of the parent</b>	<b><u>99,425</u></b>
Proportion of the Group's ownership interest in associate (%)	22.73
<b>Carrying amount of interest in investee</b>	<b><u>22,599</u></b>
<i>Remark:</i>	
Cash and cash equivalents	18,839

The reconciliation of the summarised financial information to the carrying amount of the Group's interest in this associate.

	<b>Unit : Million Baht</b> <b><u>Global Power</u></b> <b><u>Synergy Plc.</u></b>
Group's interest in net assets of investee as at January 1, 2019	8,756
Total comprehensive income attributable to the Group	556
Dividends received during the year	(443)
Acquisition	16,819
Difference arising from the change in the ownership interest in an investment <sup>(1)</sup>	(3,408)
Invests in equity of associate	319
<b>Carrying amount of interest in investee as at December 31, 2019</b>	<b><u>22,599</u></b>

*Immaterial associates*

The summarised financial information for the Group's interest in immaterial associates based on the amounts reported in the Group's consolidated financial statements:

	<b>Unit : Million Baht</b>
	<b><u>Immaterial</u></b>
	<b><u>associates</u></b>
<b>For the year ended December 31, 2019</b>	
Carrying amount of interests in immaterial associates	7,230
Group's share of:	
- Profit for the year	1,049
- Other comprehensive loss	(69)
- Total comprehensive income for the year	980

*Change in investment in associates*

On August 28, 2019, the Extraordinary General Meeting No.1/2019 of Global Power Synergy Plc. ("GPSC") passed a resolution approving the registered capital increase of GPSC by issuing 1,321,428,571 ordinary shares, with a par value of Baht 10 per share amounting to Baht 13,214,285,710. From the original registered capital amounting to Baht 14,983,008,000 to a new registered capital amounting to Baht 28,197,293,710, and GPSC had received such share subscription amounting to Baht 13,214,285,670. On October 9, 2019, GPSC has already registered the change of registered capital and, on September 26, 2019, GPSC called for paid-up capital from the capital increase in the number proportionate to its shareholding GPSC of 300,344,470 shares at Baht 56 per share, totalling Baht 16,819.29 million, of which fully received in October 2019.

On November 18, 2019, Kuraray GC Advanced Materials Co., Ltd. ("KGC"), a direct associate of the Group, has called for paid-up capital from the capital increase of 2,004,000 shares at Baht 100 per share, totalling Baht 200.40 million, of which fully received in December 2019.

On August 14, 2018, Thai Eastern Top Seeds Oil Co., Ltd, an indirect associate of the Group, called for paid-up capital from the capital increase of 665,999 shares at Baht 29.89 per share, totalling Baht 19.91 million, of which fully received in September 2018.

At the Board of Directors' Meeting of the Company held on June 18, 2018, the Board approved to establish KGC as a joint venture company. The purpose of the joint venture company is planned to invest in production of specialty chemicals. The Company will hold 33.4% share while Kuraray Co., Ltd (KRR) and Sumitomo Corporation (SC) will hold indirect share via KRR and SC Affiliate Company by 53.3% and 13.3%, respectively. Subsequently on June 19, 2018, KGC registered the initial authorised share capital of Baht 10 million and called for paid-up capital of 33,400 shares at Baht 100 per share, totalling Baht 3.34 million. Subsequently, on August 28, 2018, KGC had called for paid - up capital from the capital increase of 4,667,650 shares at Baht 100 per share, totalling Baht 466.77 million, of which fully received in December 2018.

According to the Board of Directors' Meeting of the Company held on March 19, 2018, the Board of Directors approved the PTTGC International Private Limited ("GC Inter") as a subsidiary to sell shares of PT Indo Thai Trading Ltd. ("ITT") holding 49% of ITT's shares. On June 26, 2019, GC Inter entered into the Sale and Purchase Agreement with a company to sell shares of ITT. Subsequently, on July 31, 2019, GC Inter transferred the shares amounting to USD 7.02 million or equivalent to Baht 215.56 million (using the average exchange rates as of the transaction date).

<sup>(1)</sup> *Difference arising from the change in the ownership interest in an investment*

GPSC had completed Tender Offer for shares of Glow Energy Public Company Limited (“GLOW”) on May 22, 2019 and December 2, 2019. In 2019, GPSC has made payment for shares to minority shareholders of totalling Baht 40,806.27 million. GPSC therefore directly and indirectly held 99.83%, increased from 69.11%, of the total authorised and paid-up shares. GPSC recognised the negative movement from change in ownership interest of Baht 14,991.99 million in its shareholders’ equity as at December 31, 2019. The Company therefore recognised this transaction as the difference arising from the change in the ownership interest in an investment, according to its shareholding interest in GPSC of 22.73%, amounting to Baht 3,407.68 million in shareholders’ equity.

### 13. OTHER INVESTMENTS

Other investments as at December 31, 2019 and 2018 consisted of:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Temporary investments</b>				
Held-to-maturities debt securities	6,175	10,503	3,500	3,696
Available-for-sale debt securities	-	1,108	-	1,108
Available-for-sale debt securities (Private funds)	545	5,207	545	5,207
<b>Total temporary investments</b>	<b>6,720</b>	<b>16,818</b>	<b>4,045</b>	<b>10,011</b>
<b>Other long-term investments</b>				
Held-to-maturities debt securities	480	484	450	484
Available-for-sale debt securities	-	1,369	-	1,369
Available-for-sale debt securities (Private funds)	1,503	4,588	1,503	4,588
Available-for-sale equity securities	384	362	384	362
Other non-marketable equity securities:				
- Exeltium SAS (4% shareholding by the Group)	238	283	-	-
- Others	306	60	4	3
<b>Total other long-term investments</b>	<b>2,911</b>	<b>7,146</b>	<b>2,341</b>	<b>6,806</b>

During the third quarter of 2016, the Company established private funds and engaged local independent assets management companies for the purpose of cash balance management of the Company. Those private funds have invested in deposits at bank and debt securities which had high liquidity and credit quality. As at December 31, 2019 and 2018, the value of private funds outstanding totalled Baht 2,127 million and Baht 10,388 million, respectively.

#### 14. INVESTMENT PROPERTIES

Investment properties as at December 31, 2019 and 2018 consisted of:

	<i>Note</i>	<u>Consolidated financial statements</u>			<u>Unit : Million Baht Separate financial statements</u>
		<u>Land</u>	<u>Buildings</u>	<u>Total</u>	<u>Land</u>
<i>Cost</i>					
As at January 1, 2018		5,482	41	5,523	-
Reclassification	41	977	-	977	1,741
<b>As at December 31, 2018 and January 1, 2019</b>		<b>6,459</b>	<b>41</b>	<b>6,500</b>	<b>1,741</b>
<b>As at December 31, 2019</b>		<b>6,459</b>	<b>41</b>	<b>6,500</b>	<b>1,741</b>
<i>Accumulated depreciation</i>					
As at January 1, 2018		-	-	-	-
Depreciation charge for the year		-	(1)	(1)	-
<b>As at December 31, 2018 and January 1, 2019</b>		<b>-</b>	<b>(1)</b>	<b>(1)</b>	<b>-</b>
Depreciation charge for the year		-	(1)	(1)	-
<b>As at December 31, 2019</b>		<b>-</b>	<b>(2)</b>	<b>(2)</b>	<b>-</b>
<i>Net book value</i>					
As at January 1, 2018		5,482	41	5,523	-
<b>As at December 31, 2018 and January 1, 2019</b>		<b>6,459</b>	<b>40</b>	<b>6,499</b>	<b>1,741</b>
<b>As at December 31, 2019</b>		<b>6,459</b>	<b>39</b>	<b>6,498</b>	<b>1,741</b>

The fair value of investment properties of the Group as at December 31, 2019 of Baht 8,435 million (2018: Baht 7,728 million) was determined at open market values on an existing use basis and income approach. The fair value measurement for investment properties has been categorised as Levels 2 and 3 fair value, respectively.

The fair value of investment properties of the Company as at December 31, 2019 of Baht 3,700 million (2018: Baht 3,700 million) was determined at open market values on an existing use basis. The fair value measurement for investment properties has been categorised as a Level 2 fair value.

#### Measurement of fair value

##### *Fair value hierarchy*

The fair value of investment properties was determined by independent external property valuers, having appropriate recognised professional qualifications and recent experience in the property being valued. The independent valuers provide the fair value of the Group's investment properties portfolio on an annual basis.

##### *Valuation technique and significant unobservable inputs*

The fair value of investment properties for land was determined by independent property valuers at open market values by scoring and weighted other different factors.

The fair value of investment properties for buildings was determined by the Group at income approach. The significant unobservable inputs comprise yield rate and finance costs.

Amounts recognised in the statements of profit or loss that are related to investment properties for the years ended December 31, are as follows:

	<u>Consolidated financial statements</u>		<u>Unit : Million Baht Separate financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Rental income	122	13	162	-

15. PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment as at December 31, 2019 and 2018 consist of:

Unit : Million Baht

<u>Consolidated financial statements</u>								
	<u>Notes</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<b>Cost</b>								
As at January 1, 2018		9,074	339,710	16,834	2,579	842	21,949	390,988
Additions		1,864	521	123	252	54	30,227	33,041
Acquired through business acquisitions	5	1,959	7,309	205	6	-	70	9,549
Transfers		358	10,468	518	140	-	(11,160)	324
Reclassifications	41	(977)	9,062	-	-	-	-	8,085
Disposals		-	(2,062)	(2)	(177)	(15)	(69)	(2,325)
Effect of change in foreign exchange rates		(15)	(481)	(64)	(2)	-	(51)	(613)
<b>As at December 31, 2018 and January 1, 2019</b>		<b>12,263</b>	<b>364,527</b>	<b>17,614</b>	<b>2,798</b>	<b>881</b>	<b>40,966</b>	<b>439,049</b>
Additions		76	2,073	37	300	251	30,837	33,574
Transfers		41	10,458	406	91	1	(11,057)	(60)
Disposals		-	(3,918)	(8)	(204)	(168)	(18)	(4,316)
Effect of change in exchange rates		(111)	(980)	(130)	(11)	-	(458)	(1,690)
<b>As at December 31, 2019</b>		<b>12,269</b>	<b>372,160</b>	<b>17,919</b>	<b>2,974</b>	<b>965</b>	<b>60,270</b>	<b>466,557</b>

Unit : Million Baht

<u>Consolidated financial statements</u>							
<i>Note</i>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<i>Accumulated depreciation and allowance for impairment</i>							
As at January 1, 2018	(1,288)	(158,903)	(7,070)	(1,882)	(592)	(1,564)	(171,299)
Depreciation charge for the year	(86)	(15,925)	(717)	(296)	(66)	-	(17,090)
Transfers	-	(7)	-	-	-	-	(7)
Reclassification	-	(2,776)	-	-	-	-	(2,776)
Disposals	-	1,287	(13)	171	13	-	1,458
Reversal of impairment losses	-	739	14	-	-	-	753
Effect of change in foreign exchange rates	4	206	22	1	-	9	242
<b>As at December 31, 2018 and January 1, 2019</b>	<b>(1,370)</b>	<b>(175,379)</b>	<b>(7,764)</b>	<b>(2,006)</b>	<b>(645)</b>	<b>(1,555)</b>	<b>(188,719)</b>
Depreciation charge for the year	(99)	(16,937)	(727)	(327)	(98)	-	(18,188)
Transfers	-	(25)	-	-	(2)	-	(27)
Disposals	-	3,875	4	191	168	-	4,238
Reversal of impairment losses	3	-	-	-	-	-	3
Effect of change in foreign exchange rates	38	508	53	9	-	91	699
<b>As at December 31, 2019</b>	<b>(1,428)</b>	<b>(187,958)</b>	<b>(8,434)</b>	<b>(2,133)</b>	<b>(577)</b>	<b>(1,464)</b>	<b>(201,994)</b>

Unit : Million Baht

**Consolidated financial statements**

	<b><u>Land and land improvement</u></b>	<b><u>Plant, machinery, equipment and factory tools</u></b>	<b><u>Buildings and buildings improvement</u></b>	<b><u>Furniture, fixtures and office equipment</u></b>	<b><u>Vehicles</u></b>	<b><u>Assets under construction</u></b>	<b><u>Total</u></b>
<b><i>Net book value</i></b>							
<b>As at January 1, 2018</b>							
Owned assets	7,786	180,807	9,764	539	110	20,385	219,391
Assets under finance leases	-	-	-	158	140	-	298
	<b>7,786</b>	<b>180,807</b>	<b>9,764</b>	<b>697</b>	<b>250</b>	<b>20,385</b>	<b>219,689</b>
<b>As at December 31, 2018 and January 1, 2019</b>							
Owned assets	10,893	189,148	9,850	618	109	39,411	250,029
Assets under finance leases	-	-	-	174	127	-	301
	<b>10,893</b>	<b>189,148</b>	<b>9,850</b>	<b>792</b>	<b>236</b>	<b>39,411</b>	<b>250,330</b>
<b>As at December 31, 2019</b>							
Owned assets	10,841	184,202	9,485	587	266	58,806	264,187
Assets under finance leases	-	-	-	254	122	-	376
	<b>10,841</b>	<b>184,202</b>	<b>9,485</b>	<b>841</b>	<b>388</b>	<b>58,806</b>	<b>264,563</b>

The gross amount of the Group's fully depreciated buildings and equipment that was still in use as at December 31, 2019 amounted to Baht 20,213 million (2018: Baht 17,947 million).

*Security*

As at December 31, 2019, the Group's assets with a net book value of Baht 15,837 million (2018: Baht 17,069 million) were registered to secure Bank loan (see note 20).

*Property, plant and equipment under construction*

As at December 31, 2019, capitalised borrowing costs relating to the acquisition of the land and the construction of the new factory amounted to Baht 735 million (2018: Baht 504 million), with a capitalisation rate of 3.59% to 5.00% (2018: 3.38% to 5.00%).

Unit : Million Baht

	<u>Separate financial statements</u>							
	<u>Note</u>	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<b>Cost</b>								
As at January 1, 2018		6,279	265,675	9,309	1,637	539	12,649	296,088
Additions		291	523	28	168	21	17,420	18,451
Transfers		69	8,947	370	106	-	(9,502)	(10)
Reclassifications	41	(1,741)	6,896	-	-	-	-	5,155
Disposals		-	(929)	(3)	(169)	(3)	(64)	(1,168)
<b>As at December 31, 2018 and January 1, 2019</b>		<b>4,898</b>	<b>281,112</b>	<b>9,704</b>	<b>1,742</b>	<b>557</b>	<b>20,503</b>	<b>318,516</b>
Additions		20	1,703	33	225	227	17,907	20,115
Transfers		34	6,481	64	50	-	(6,659)	(30)
Disposals		-	(2,696)	(3)	(124)	(146)	(15)	(2,984)
<b>As at December 31, 2019</b>		<b>4,952</b>	<b>286,600</b>	<b>9,798</b>	<b>1,893</b>	<b>638</b>	<b>31,736</b>	<b>335,617</b>
<b>Accumulated depreciation</b>								
As at January 1, 2018		(537)	(123,780)	(3,928)	(1,196)	(379)	(270)	(130,090)
Depreciation charge for the year		(59)	(12,002)	(398)	(199)	(38)	-	(12,696)
Reclassification	41	-	(2,316)	-	-	-	-	(2,316)
Disposals		-	907	3	163	3	-	1,076
<b>As at December 31, 2018 and January 1, 2019</b>		<b>(596)</b>	<b>(137,191)</b>	<b>(4,323)</b>	<b>(1,232)</b>	<b>(414)</b>	<b>(270)</b>	<b>(144,026)</b>
Depreciation charge for the year		(55)	(12,048)	(406)	(218)	(68)	-	(12,795)
Disposals		-	2,665	2	124	145	-	2,936
<b>As at December 31, 2019</b>		<b>(651)</b>	<b>(146,574)</b>	<b>(4,727)</b>	<b>(1,326)</b>	<b>(337)</b>	<b>(270)</b>	<b>(153,885)</b>



Unit : Million Baht

Separate financial statements

	<u>Land and land improvement</u>	<u>Plant, machinery, equipment and factory tools</u>	<u>Buildings and buildings improvement</u>	<u>Furniture, fixtures and office equipment</u>	<u>Vehicles</u>	<u>Assets under construction</u>	<u>Total</u>
<i>Net book value</i>							
<b>As at January 1, 2018</b>							
Owned assets	5,742	141,895	5,381	318	67	12,379	165,782
Assets under finance leases	-	-	-	123	93	-	216
	<b>5,742</b>	<b>141,895</b>	<b>5,381</b>	<b>441</b>	<b>160</b>	<b>12,379</b>	<b>165,998</b>
<b>As at December 31, 2018 and January 1, 2019</b>							
Owned assets	4,302	143,921	5,381	371	63	20,233	174,271
Assets under finance leases	-	-	-	139	80	-	219
	<b>4,302</b>	<b>143,921</b>	<b>5,381</b>	<b>510</b>	<b>143</b>	<b>20,233</b>	<b>174,490</b>
<b>As at December 31, 2019</b>							
Owned assets	4,301	140,026	5,071	368	225	31,466	181,457
Assets under finance leases	-	-	-	199	76	-	275
	<b>4,301</b>	<b>140,026</b>	<b>5,071</b>	<b>567</b>	<b>301</b>	<b>31,466</b>	<b>181,732</b>

The gross amount of the Company's fully depreciated buildings and equipment that was still in use as at December 31, 2019 amounted to Baht 12,612 million (2018: Baht 11,079 million).

*Property, plant and equipment under construction*

As at December 31, 2019, capitalised borrowing costs relating to the acquisition of the land and the construction of the new factory amounted to Baht 329 million (2018: Baht 192 million), with a capitalisation rate of 5.00% (2018: 5.00%).

16. LAND LEASEHOLD RIGHT

Land leasehold right as at December 31, 2019 and 2018 consist of:

	<u>Consolidated</u> <u>financial statements</u>	Unit : Million Baht <u>Separate</u> <u>financial statements</u>
<i>Cost</i>		
As at January 1, 2018	1,131	1,130
<b>As at December 31, 2018 and January 1, 2019</b>	<b>1,131</b>	<b>1,130</b>
Additions	7	-
<b>As at December 31, 2019</b>	<b>1,138</b>	<b>1,130</b>
<i>Accumulated amortisation</i>		
As at January 1, 2018	(807)	(806)
Amortisation charge for the year	(90)	(90)
<b>As at December 31, 2018 and January 1, 2019</b>	<b>(897)</b>	<b>(896)</b>
Amortisation charge for the year	(50)	(50)
<b>As at December 31, 2019</b>	<b>(947)</b>	<b>(946)</b>
<i>Net book value</i>		
As at January 1, 2018	324	324
As at December 31, 2018 and January 1, 2019	234	234
<b>As at December 31, 2019</b>	<b>191</b>	<b>184</b>

17. GOODWILL

Goodwill as at December 31, 2019 and 2018 consist of:

	Unit : Million Baht <u>Consolidated</u> <u>financial statements</u>
<i>Cost</i>	
As at January 1, 2018	1,648
<b>As at December 31, 2018 and January 1, 2019</b>	<b>1,648</b>
<b>As at December 31, 2019</b>	<b>1,648</b>
<i>Allowance for impairment</i>	
As at January 1, 2018	(717)
<b>As at December 31, 2018 and January 1, 2019</b>	<b>(717)</b>
<b>As at December 31, 2019</b>	<b>(717)</b>
<i>Net book value</i>	
As at January 1, 2018	931
<b>As at December 31, 2018 and January 1, 2019</b>	<b>931</b>
<b>As at December 31, 2019</b>	<b>931</b>

**18. INTANGIBLE ASSETS**

Intangible assets as at December 31, 2019 and 2018 consist of:

Unit : Million Baht

		<u>Consolidated financial statements</u>						
	<u>Note</u>	<u>Production licence fees</u>	<u>Computer software</u>	<u>Customer contracts and the related customer relationships</u>	<u>Right to use pipe rack</u>	<u>Right to use others</u>	<u>Intangible assets under development</u>	<u>Total</u>
<b>Cost</b>								
As at January 1, 2018		5,980	4,210	149	508	2,743	1,337	14,927
Additions		23	58	-	15	6	921	1,023
Acquired through business acquisitions	5	-	5	-	-	3	-	8
Transfers		1,162	348	-	7	5	(1,520)	2
Disposals		-	(7)	-	-	(191)	-	(198)
Effect of change in foreign exchange rates		-	(5)	(1)	-	(63)	(2)	(71)
<b>As at December 31, 2018 and January 1, 2019</b>		<b>7,165</b>	<b>4,609</b>	<b>148</b>	<b>530</b>	<b>2,503</b>	<b>736</b>	<b>15,691</b>
Additions		274	19	-	-	5	733	1,031
Transfers		268	389	-	17	41	(703)	12
Disposals		-	(7)	-	-	-	(86)	(93)
Effect of change in foreign exchange rates		-	(13)	(11)	-	(169)	(3)	(196)
<b>As at December 31, 2019</b>		<b>7,707</b>	<b>4,997</b>	<b>137</b>	<b>547</b>	<b>2,380</b>	<b>677</b>	<b>16,445</b>

Unit : Million Baht

	<u>Consolidated financial statements</u>						
	<u>Production licence fees</u>	<u>Computer Software</u>	<u>Customer contracts and the related customer relationships</u>	<u>Right to use pipe rack</u>	<u>Right to use others</u>	<u>Intangible assets under development</u>	<u>Total</u>
<i>Accumulated amortisation and allowance for impairment</i>							
As at January 1, 2018	(2,355)	(2,372)	(130)	(358)	(1,922)	(22)	(7,159)
Amortisation charge for the year	(243)	(308)	(12)	(29)	(127)	-	(719)
Disposals	-	7	-	-	105	-	112
Reversal of impairment losses	-	-	-	-	86	-	86
Effect of change in foreign exchange rates	-	5	2	-	37	-	44
<b>As at December 31, 2018 and January 1, 2019</b>	<b>(2,598)</b>	<b>(2,668)</b>	<b>(140)</b>	<b>(387)</b>	<b>(1,821)</b>	<b>(22)</b>	<b>(7,636)</b>
Amortisation charge for the year	(268)	(342)	(7)	(31)	(117)	-	(765)
Transfers	-	4	-	-	22	-	26
Disposal	-	5	-	-	-	-	5
Effect of change in foreign exchange rates	-	12	10	-	124	-	146
<b>As at December 31, 2019</b>	<b>(2,866)</b>	<b>(2,989)</b>	<b>(137)</b>	<b>(418)</b>	<b>(1,792)</b>	<b>(22)</b>	<b>(8,224)</b>
<i>Net book value</i>							
As at January 1, 2018	<u>3,625</u>	<u>1,838</u>	<u>19</u>	<u>150</u>	<u>821</u>	<u>1,315</u>	<u>7,768</u>
As at December 31, 2018 and January 1, 2019	<u>4,567</u>	<u>1,941</u>	<u>8</u>	<u>143</u>	<u>682</u>	<u>714</u>	<u>8,055</u>
As at December 31, 2019	<u>4,841</u>	<u>2,008</u>	<u>-</u>	<u>129</u>	<u>588</u>	<u>655</u>	<u>8,221</u>

Unit : Million Baht

	<u>Separate financial statements</u>				<u>Intangible assets under development</u>	<u>Total</u>
	<u>Production licence fees</u>	<u>Computer software</u>	<u>Right to use pipe rack</u>	<u>Right to use others</u>		
<i>Cost</i>						
As at January 1, 2018	4,120	3,288	415	-	1,146	8,969
Additions	10	22	15	-	730	777
Transfers	1,162	305	4	-	(1,471)	-
Disposals	-	(6)	-	-	-	(6)
<b>As at December 31, 2018 and January 1, 2019</b>	<b>5,292</b>	<b>3,609</b>	<b>434</b>	<b>-</b>	<b>405</b>	<b>9,740</b>
Additions	233	4	-	-	545	782
Transfers	267	219	20	-	(506)	-
Disposals	-	-	-	-	(62)	(62)
<b>As at December 31, 2019</b>	<b>5,792</b>	<b>3,832</b>	<b>454</b>	<b>-</b>	<b>382</b>	<b>10,460</b>
<i>Accumulated amortisation</i>						
As at January 1, 2018	(1,644)	(1,734)	(278)	-	(22)	(3,678)
Amortisation charge for the year	(189)	(248)	(27)	-	-	(464)
Disposals	-	6	-	-	-	6
<b>As at December 31, 2018 and January 1, 2019</b>	<b>(1,833)</b>	<b>(1,976)</b>	<b>(305)</b>	<b>-</b>	<b>(22)</b>	<b>(4,136)</b>
Amortisation charge for the year	(214)	(273)	(28)	-	-	(515)
Disposals	-	-	-	-	-	-
<b>As at December 31, 2019</b>	<b>(2,047)</b>	<b>(2,249)</b>	<b>(333)</b>	<b>-</b>	<b>(22)</b>	<b>(4,651)</b>
<i>Net book value</i>						
As at January 1, 2018	<u>2,476</u>	<u>1,554</u>	<u>137</u>	<u>-</u>	<u>1,124</u>	<u>5,291</u>
As at December 31, 2018 and January 1, 2019	<u>3,459</u>	<u>1,633</u>	<u>129</u>	<u>-</u>	<u>383</u>	<u>5,604</u>
As at December 31, 2019	<u>3,745</u>	<u>1,583</u>	<u>121</u>	<u>-</u>	<u>360</u>	<u>5,809</u>

19. DEFERRED TAX

Movements in total deferred tax assets and liabilities during the years were as follows:

Unit : Million Baht

	<u>Consolidated financial statements</u>					<u>As at</u> <u>December 31,</u> <u>2019</u>
	<u>(Charged) / credited to:</u>					
	<u>As at</u> <u>January 1,</u> <u>2019</u>	<u>Profit</u> <u>or loss</u>	<u>Other</u> <u>comprehensive</u> <u>income (loss)</u>	<u>Exchange</u> <u>differences</u>	<u>Acquisition</u> <u>of businesses</u>	
<i>Deferred tax assets</i>						
Inventories	12	(8)	-	-	-	4
Employee benefits expenses	725	262	3	-	-	990
Tax loss carry forward	848	(143)	-	-	(1)	704
Others	647	77	59	-	(3)	780
<b>Total</b>	<b>2,232</b>	<b>188</b>	<b>62</b>	<b>-</b>	<b>(4)</b>	<b>2,478</b>
<i>Deferred tax liabilities</i>						
Property, plant and equipment	(3,469)	(231)	-	(11)	15	(3,696)
Finance lease assets	(6)	-	-	-	-	(6)
Others	(333)	172	(8)	-	1	(168)
<b>Total</b>	<b>(3,808)</b>	<b>(59)</b>	<b>(8)</b>	<b>(11)</b>	<b>16</b>	<b>(3,870)</b>
<b>Net</b>	<b>(1,576)</b>	<b>129</b>	<b>54</b>	<b>(11)</b>	<b>12</b>	<b>(1,392)</b>

Unit : Million Baht

	<u>Consolidated financial statements</u>					<u>As at</u> <u>December 31,</u> <u>2018</u>
	<u>(Charged) / credited to:</u>					
	<u>As at</u> <u>January 1,</u> <u>2018</u>	<u>Profit</u> <u>or loss</u>	<u>Other</u> <u>comprehensive</u> <u>income (loss)</u>	<u>Exchange</u> <u>differences</u>	<u>Acquisition</u> <u>of businesses</u>	
<i>Deferred tax assets</i>						
Inventories	10	1	-	-	1	12
Employee benefits expenses	688	18	-	-	19	725
Capital distribution from subsidiaries	22	(22)	-	-	-	-
Loss carry forward	41	650	-	(1)	158	848
Others	610	18	-	-	19	647
<b>Total</b>	<b>1,371</b>	<b>665</b>	<b>-</b>	<b>(1)</b>	<b>197</b>	<b>2,232</b>
<i>Deferred tax liabilities</i>						
Property, plant and equipment	(2,847)	146	-	9	(777)	(3,469)
Finance lease assets	(7)	1	-	-	-	(6)
Others	(48)	(268)	(13)	-	(4)	(333)
<b>Total</b>	<b>(2,902)</b>	<b>(121)</b>	<b>(13)</b>	<b>9</b>	<b>(781)</b>	<b>(3,808)</b>
<b>Net</b>	<b>(1,531)</b>	<b>544</b>	<b>(13)</b>	<b>8</b>	<b>(584)</b>	<b>(1,576)</b>

Unit : Million Baht

	<u>Separate financial statements</u> (Charged) / credited to:			<u>As at</u> <u>December 31,</u> <u>2019</u>
	<u>As at</u> <u>January 1,</u> <u>2019</u>	<u>Profit</u> <u>or loss</u>	<u>Other</u> <u>comprehensive</u> <u>income (loss)</u>	
<b>Deferred tax assets</b>				
Inventories	11	(8)	-	3
Employee benefits expenses	584	207	-	791
Others	356	64	15	435
<b>Total</b>	<b>951</b>	<b>263</b>	<b>15</b>	<b>1,229</b>
<b>Deferred tax liabilities</b>				
Inventories	(244)	209	-	(35)
Property, plant and equipment	(2,432)	(287)	-	(2,719)
Finance lease assets	(5)	1	-	(4)
Others	(59)	4	(8)	(63)
<b>Total</b>	<b>(2,740)</b>	<b>(73)</b>	<b>(8)</b>	<b>(2,821)</b>
<b>Net</b>	<b>(1,789)</b>	<b>190</b>	<b>7</b>	<b>(1,592)</b>

Unit : Million Baht

	<u>Separate financial statements</u> (Charged) / credited to:			<u>As at</u> <u>December 31,</u> <u>2018</u>
	<u>As at</u> <u>January 1,</u> <u>2018</u>	<u>Profit</u> <u>or loss</u>	<u>Other</u> <u>comprehensive</u> <u>income (loss)</u>	
<b>Deferred tax assets</b>				
Inventories	10	1	-	11
Employee benefits expenses	573	11	-	584
Capital distribution from subsidiaries	22	(22)	-	-
Others	352	4	-	356
<b>Total</b>	<b>957</b>	<b>(6)</b>	<b>-</b>	<b>951</b>
<b>Deferred tax liabilities</b>				
Inventories	(1)	(243)	-	(244)
Property, plant and equipment	(2,530)	98	-	(2,432)
Finance lease assets	(5)	-	-	(5)
Others	(32)	(14)	(13)	(59)
<b>Total</b>	<b>(2,568)</b>	<b>(159)</b>	<b>(13)</b>	<b>(2,740)</b>
<b>Net</b>	<b>(1,611)</b>	<b>(165)</b>	<b>(13)</b>	<b>(1,789)</b>

In the fourth quarter of 2019 and 2018, the Group recognised deferred tax assets of previously unrecognised tax losses because management considered it probable that future taxable profits would be available against which such losses can be used.

## 20. INTEREST-BEARING LIABILITIES

Interest bearing liabilities are defined as borrowings, debentures and finance lease liabilities. The balances as at December 31, 2019 and 2018 were as follows:

Unit : Million Baht

	<i>Note</i>	<u>Consolidated</u> <u>financial statements</u>		<u>Separate</u> <u>financial statements</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Current</b>					
Short-term borrowings from financial institutions					
Secured		427	388	-	-
Unsecured		1,594	2,955	-	-
Short-term borrowings from related parties					
Unsecured	27	-	-	3,041	1,931
<b>Short-term borrowings</b>		<b>2,021</b>	<b>3,343</b>	<b>3,041</b>	<b>1,931</b>

	<i>Note</i>	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
		<u>financial statements</u>		<u>Separate</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Current (Continue)</b>					
Current portion of long-term borrowings from financial institutions					
Secured		265	883	-	-
Unsecured		7,843	6,164	7,078	4,306
Current portion of long-term borrowings from other parties					
Secured		-	894	-	-
Unsecured		41	34	-	-
Current portion of debentures					
Unsecured		-	1,942	-	1,942
<b>Current portion of long-term borrowings and debentures</b>		<b>8,149</b>	<b>9,917</b>	<b>7,078</b>	<b>6,248</b>
Current portion of finance lease liabilities	22	187	138	141	93
<b>Total current</b>		<b>10,357</b>	<b>13,398</b>	<b>10,260</b>	<b>8,272</b>
<b>Non-current</b>					
Long-term borrowings from financial institutions					
Secured		16,908	13,648	-	-
Unsecured		9,610	17,267	2,995	10,113
Long-term borrowing from a related party					
Unsecured	27	-	-	14,991	16,105
Long-term borrowings from other parties					
Secured		-	-	-	-
Unsecured		269	324	-	-
Debentures					
Unsecured		70,131	52,408	55,221	36,379
<b>Long-term borrowings and debentures</b>		<b>96,918</b>	<b>83,647</b>	<b>73,207</b>	<b>62,597</b>
Finance lease liabilities		215	181	148	133
<b>Total non-current</b>		<b>97,133</b>	<b>83,828</b>	<b>73,355</b>	<b>62,730</b>
<b>Total</b>		<b>107,490</b>	<b>97,226</b>	<b>83,615</b>	<b>71,002</b>

As at December 31, 2019, the Group had unutilised credit facilities totalling Baht 12,285 million (2018: Baht 19,072 million).

The periods to maturity of interest-bearing liabilities, excluding finance lease liabilities, as at December 31, 2019 and 2018 were as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Within one year	10,170	13,260	10,119	8,179
After one year but within five years	75,970	74,624	64,717	62,597
After five years	20,948	9,023	8,490	-
<b>Total</b>	<b>107,088</b>	<b>96,907</b>	<b>83,326</b>	<b>70,776</b>

Long-term borrowings as at December 31, 2019 and 2018 were secured on the following assets:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Cash and cash equivalents	60	192	-	-
Property, plant and equipment	15,837	17,962	-	-



Debentures and Borrowings from financial institutions of the Group were as follows:

*Debentures*

On August 22, 2019, the Company issued a 5-year tenor, name-registered, unsubordinated and unsecured debentures with debentureholders' representative. Debenture issuer has rights to redeem the debentures prior to maturity after one year of issuance. The debentures have an issued 10 million units and the issue price per unit is Baht 1,000, totalling Baht 10,000 million. The use of proceeds are for debt settlement and/or for business expansion and/or for working capital. The coupon rate is 2.90% per annum with interest payable on semi-annual basis and maturity in August 2024.

On September 5, 2019, the Company issued name-registered, unsubordinated and unsecured debentures without a debentureholders' representative for institutional investors. The debentures have an issued 10 million units and the issue price per unit is Baht 1,000, totalling Baht 10,000 million separate into 3 tranches, A 5-year tenor, Baht 1,500 million, carrying a 2.20% coupon rate per annum with interest payable on semi-annual basis and maturity in September 2024; A 7-year tenor, Baht 7,000 million, carrying a 2.43% coupon rate per annum with interest payable on semi-annual basis and maturity in September 2026; A 10-year tenor, Baht 1,500 million, carrying a 2.75% coupon rate per annum with interest payable on semi-annual basis and maturity in September 2029. The use of proceeds is for business expansion.

As at December 31, 2019, the Group had unsubordinated and unsecured debentures in US dollar and Thai Baht in the amount of Baht 70,131 million (2018: Baht 54,350 million). These debentures have maturity periods between 4 years to 10 years, bear different interest rates and repayment schedules as specified in each agreement.

Details of the Group's debentures as at December 31, 2019 were as follows:

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (% p.a.)	Repayment Terms
<b>The Company</b>						
Unsubordinated debenture at 99.108% of the face value unsecured with a debentureholders' representative	USD	504.11	1,000	10	4.25	Interest is payable on a semi-annual basis and maturity in September 2022.
Unsubordinated debenture unsecured with a debentureholders' representative	Baht	10,000	1,000	7	4.50	Interest is payable on a semi-annual basis and maturity in August 2021.
Unsubordinated debenture unsecured with a debentureholders' representative and debenture issuer has right to redeem the debentures prior to maturity after one year of issuance	Baht	10,000	1,000	4	3.05	Interest is payable on a semi-annual basis and maturity in August 2021.

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (% p.a.)	Repayment Terms
<b>The Company</b> (Continue)						
Unsubordinated debenture unsecured with a debentureholders' representative and debenture issuer has right to redeem the debentures prior to maturity after one year of issuance	Baht	10,000	1,000	5	2.90	Interest is payable on a semi-annual basis and maturity in August 2024.
Unsubordinated debenture unsecured without a debentureholders' representative	Baht	1,500	1,000	5	2.20	Interest is payable on a semi-annual basis and maturity in September 2024.
Unsubordinated debenture unsecured without a debentureholders' representative	Baht	7,000	1,000	7	2.43	Interest is payable on a semi-annual basis and maturity in September 2026.
Unsubordinated debenture unsecured without a debentureholders' representative	Baht	1,500	1,000	10	2.75	Interest is payable on a semi-annual basis and maturity in September 2029.
<b>Subsidiaries</b>						
Unsubordinated debenture at 100.00% of the face value unsecured with a debentureholders' representative	USD	495.89	1,000	4.2	4.25	Interest is payable on a semi-annual basis and maturity in September 2022.

*Borrowings from financial institutions*

As at December 31, 2019, the Group and the Company had long-term and revolving long-term credit facility agreements with several financial institutions totalling Baht 34,626 million and Baht 10,073 million, respectively (2018: Baht 37,962 million and Baht 14,419 million, respectively) bear different interest rates as specified in each agreement. The Group is required to comply with certain covenants pertaining to maintain of certain financial ratios, percentage of share held by the major shareholder and other conditions as specified in each agreement.

Details of the Group's borrowings as at December 31, 2019 were as follows:

<b>Currency</b>	<b>Facilities (in million)</b>	<b>Interest Rates (% p.a.)</b>	<b>Repayment Terms</b>
<b>The Company</b>			
Baht	3,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from July 2015.
Baht	7,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 15 instalments commencing from September 2013.
USD	100	LIBOR 6M plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from March 2016.
Baht	3,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from March 2014.
Baht	6,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from March 2016.
Baht	5,000	THBFIX 6M plus margin	Principal is repayable in 2 instalments in December 2020 and June 2023.
<b>Subsidiaries</b>			
EUR	180	EURIBOR 3M plus margin	Principal is repayable on an annual basis, in 6 instalments commencing from 2021.
Baht	1,000	Fixed rate	Principal is repayable on a quarterly basis, in 16 instalments commencing from September 2016.
Baht	700	BIBOR 3M plus margin	Principal is repayable on a quarterly basis, in 16 instalments, commencing from March 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from April 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from May 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 12 instalments commencing from May 2017.
Baht	8,653.87	Highest interest rate for 6 month-fixed deposit (4 Banks averaged) plus margin	Principal is repayable on a semi-annual basis, in 17 instalments commencing from September 2018.

Currency	Facilities (in million)	Interest Rates (% p.a.)	Repayment Terms
<b>Subsidiaries (Continue)</b>			
Baht	500	Fixed rate	Principal is repayable on a quarterly basis, in 13 instalments commencing from January 2021.
Baht	500	Fixed rate	Principal is repayable on a quarterly basis, in 10 instalments commencing from June 2019.
Baht	575	BIBOR 3M plus margin	Principal is repayable on a quarterly basis, in 13 instalments commencing from September 2019.
Baht	14,357	THBFIX 3M plus margin	Principal is repayable on a semi-annual basis, in 24 instalments commencing from February 2021.
Baht	6,004	THBFIX 3M plus margin	Principal is repayable on a semi-annual basis, in 20 instalments commencing from February 2021.

As at December 31, 2019, the subsidiaries' interest-bearing liabilities were guaranteed by the Company totalling Baht 19,777 million (2018: Baht 22,217 million) (See note 39).

## 21. TRADE PAYABLES

Trade payables as at December 31, 2019 and 2018 consisted of:

	<i>Note</i>	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Related parties	27	20,727	28,167	19,470	26,147
Other parties		4,752	6,349	450	1,313
<b>Total</b>		<b>25,479</b>	<b>34,516</b>	<b>19,920</b>	<b>27,460</b>

## 22. OTHER PAYABLES

Other payables as at December 31, 2019 and 2018 consisted of:

	<u>Consolidated</u> <u>financial statements</u>		<u>Unit : Million Baht</u> <u>Separate</u> <u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Accrued operating expenses	3,689	3,303	1,708	2,120
Accrued interest expenses	846	706	863	715
Other payables	5,265	5,193	5,138	4,331
Deposits and advances received	3,313	1,979	62	198
Retention payables	-	49	-	24
Current portion of finance lease liabilities	187	138	141	93
Withholding tax payable	460	451	327	259
Accrued other tax expenses	271	4,005	183	3,967
Others	62	44	21	6
<b>Total</b>	<b>14,093</b>	<b>15,868</b>	<b>8,443</b>	<b>11,713</b>

**23. PROVISIONS FOR EMPLOYEE BENEFITS**

Provisions for employee benefits as at December 31, 2019 and 2018 consisted of:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Post-employment benefits	4,860	3,585	3,553	2,545
Other long-term employee benefits	698	698	461	470
<b>Total</b>	<b>5,558</b>	<b>4,283</b>	<b>4,014</b>	<b>3,015</b>

Movement in the present value of the defined employee benefit obligations were as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
As at January 1,	4,283	4,011	3,015	2,832
<b>Include in profit or loss:</b>				
Current service costs	368	294	235	192
Interest on obligation	130	102	101	80
Past service costs	993	-	820	-
Actuarial (gain) loss	11	(12)	-	-
	<u>1,502</u>	<u>384</u>	<u>1,156</u>	<u>272</u>
<b>Included in other comprehensive income</b>				
Actuarial (gain) loss	57	(20)	-	-
Exchange differences on translating financial statement	(54)	(32)	-	-
	<u>3</u>	<u>(52)</u>	<u>-</u>	<u>-</u>
<b>Others</b>				
Benefits paid by the plan	(234)	(150)	(157)	(89)
Defined benefit obligations from acquisition of business	-	90	-	-
Recorded as cost of assets under construction	4	-	-	-
	<u>(230)</u>	<u>(60)</u>	<u>(157)</u>	<u>(89)</u>
<b>As at December 31,</b>	<b>5,558</b>	<b>4,283</b>	<b>4,014</b>	<b>3,015</b>

Actuarial (gains) losses recognised in other comprehensive income arising from:

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Demographic assumptions	-	-	-	-
Financial assumptions	58	(19)	-	-
Experience adjustment	(1)	(1)	-	-
<b>Total</b>	<b>57</b>	<b>(20)</b>	<b>-</b>	<b>-</b>

For the years ended December 31,	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Recognised in profit or loss:</b>				
Post-employment benefits	1,418	326	1,111	226
Other long-term employee benefits	84	58	45	46
<b>Total</b>	<b>1,502</b>	<b>384</b>	<b>1,156</b>	<b>272</b>
<b>Recognised in other comprehensive income:</b>				
Actuarial (gains) losses recognised during the year	57	(20)	-	-
Cumulative actuarial (gains) losses recognised	(903)	1,043	-	824

The expense is recognised in the following line items in the statement of profit or loss:

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Cost of sales	912	244	732	167
Selling and distribution and administrative expenses	590	140	424	105
<b>Total</b>	<b>1,502</b>	<b>384</b>	<b>1,156</b>	<b>272</b>

**Actuarial assumptions**

The following were the principal actuarial assumptions as at December 31, 2019 and 2018 (expressed as weighted-averages):

	<u>Consolidated</u>		Unit : %	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Discount rate	1.0-4.0	1.8-3.5	2.9	2.9
Future salary growth	3.0-7.0	1.5-8.0	7.0	7.0
Employee turnover	0-50	0-50	0-3	0-3
Retirement age	55-65 years	55-65 years	60 years	60 years

Assumptions regarding future mortality have been based on published statistics and mortality tables.

As at December 31, 2019, the weighted-average duration of the defined benefit obligation was 18 years (2018: 18 years).

*Sensitivity analysis*

Reasonably possible changes at the reporting date to one of the relevant actuarial assumptions, holding other assumptions constant, would have affected the defined benefit obligation by the amounts shown below:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>Increase</u>	<u>Decrease</u>	<u>Increase</u>	<u>Decrease</u>
<b>As at December 31, 2019</b>				
Discount rate (1% movement)	(577)	667	(422)	498
Future salary growth (1% movement)	602	(498)	423	(367)
<b>As at December 31, 2018</b>				
Discount rate (1% movement)	(425)	503	(308)	363
Future salary growth (1% movement)	433	(358)	299	(259)

Although the analysis does not take account of the full distribution of cash flows expected under the plan, it does provide an approximation of the sensitivity of the assumptions shown.

The Labor Protection Act (No. 7) B.E. 2562 has been announced in the Royal Gazette on April 5, 2019, which will be effective after 30 days from the date announced in Royal Gazette. This Labor Protection Act stipulates additional legal severance pay rates for employees who have worked for an uninterrupted period of twenty years or more. Such employees are entitled to receive compensation of not less than 400 days at the employees' latest wage rate. This change is considered an amendment to post-employment benefits plan. The Group has already reflected the effect of such change by recognising past service cost as an expense in the consolidated and separate statements of profit or loss for the year ended December 31, 2019.

**24. SHARE CAPITAL**

	<u>Par value</u> <u>per share</u> <u>(Baht)</u>	<u>Unit : Million Shares / Million Baht</u>			
		<u>2019</u>		<u>2018</u>	
		<u>Number</u>	<u>Amount</u>	<u>Number</u>	<u>Amount</u>
<i>Authorised</i>					
As at January 1, ordinary shares	10	4,508.8	45,088.5	4,508.8	45,088.5
<b>As at December 31, ordinary shares</b>	10	<b>4,508.8</b>	<b>45,088.5</b>	<b>4,508.8</b>	<b>45,088.5</b>
<i>Issued and paid-up</i>					
As at January 1, ordinary shares	10	4,508.8	45,088.5	4,508.8	45,088.5
<b>As at December 31, ordinary shares</b>	10	<b>4,508.8</b>	<b>45,088.5</b>	<b>4,508.8</b>	<b>45,088.5</b>

## 25. ADDITIONAL PAID-IN CAPITAL AND RESERVES

### *Share premium*

Section 51 of the Public Companies Act B.E. 2535 requires companies to set aside share subscription monies received in excess of the par value of the shares issued to a reserve account (“share premium”). Share premium is not available for dividend distribution.

### *Premium on treasury stock*

The premium on treasury stock represents the accumulated premium on sale of treasury stock, net of any deficits on sale or cancellation of treasury stock. The premium on treasury stock is not available for dividend distribution.

### *Difference arising from business combination under common control*

Difference on common control transactions arising within equity represents the difference of the book values of certain entities or businesses under common control under their cost as of the date of their acquisition. The reserve is non-distributable and will be retained until the respective businesses are sold or otherwise disposed of.

### *Legal reserve*

Section 116 of the Public Companies Act B.E. 2535 requires that a company shall allocate not less than 5% of its annual net profit, less any accumulated losses brought forward (if any), to a reserve account (“legal reserve”), until this account reaches an amount not less than 10% of the registered authorised capital. The legal reserve is not available for dividend distribution.

### *Treasury stock reserve*

The treasury stock reserve represents the amount appropriated from retained earnings equal to the cost of the Company’s own shares held by the Company. The treasury stock reserve is not available for dividend distribution.

### *Other components of equity*

#### *Exchange differences on translating financial statements*

The exchange differences on translating financial statements account within equity comprises all foreign currency differences arising from the translation of the financial statements of foreign operations, as well as from the translation of liabilities that hedge the Company’s net investment in a foreign operation.

#### *Remeasurement of investments held as available-for-sale*

Gain or loss on remeasurement of investments held as available-for-sale account within equity comprises the cumulative net change in the fair value of available-for-sale investments until the investments are derecognised or impaired.

#### *Cash flow hedges*

The cash flow hedges account within equity comprises the cumulative net change in the fair value of cash flow hedges related to hedged transactions that have not yet occurred for effective portion.

#### *Movements in reserves*

Movements in reserves are shown in the statements of changes in equity.



## 26. TREASURY STOCK

At the Board of Directors' Meeting held on May 27, 2019, the Board approved a share repurchase program for financial management purpose not exceeding 50 million shares, or approximately 1.1 percent of the total issued shares, with the maximum amount of Baht 3,000 million. The Company may purchase the shares through the Stock Exchange of Thailand within 6 months, during the period from June 11, 2019 to December 9, 2019. Treasury stock has to be resold after 6 months but no later than 3 years from the completion date of share repurchases.

On December 9, 2019, the Company has repurchased the shares under the program totalling 22.30 million shares, equivalent to 0.49% of issued share and paid-up capital, at a total cost of Baht 1,187.60 million with an equivalent amount had been appropriated from retained earnings to treasury stock reserve.

## 27. TRANSACTIONS WITH RELATED PARTIES

A related party is as follows:

- An individual or an entity which has the ability, directly or indirectly, to control or joint control or exercise significant influence over the Group in making financial and operating decisions or;
- An individual or an entity which is subject to common control or common significant influence with the Group or;
- The Group has the ability, directly or indirectly, to control or joint control or exercise significant influence over an individual or an entity in making financial and operating decisions.

Relationships with significant related parties were as follows:

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
PTT Plc.	Thailand	Parent, some common directors and management and the Company's director as a management
Global Green Chemicals Plc.	Thailand	Subsidiary, 72.29% shareholding, some common directors and the Company's management as a director
GC Glycol Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Polyols Co., Ltd.	Thailand	Subsidiary, 82.10% shareholding and the Company's management as a director
GC Maintenance and Engineering Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Marketing Solutions Co., Ltd.	Thailand	Subsidiary, 100% shareholding by the Group, and the Company's management as a director
GC Logistics Solutions Co., Ltd.	Thailand	Subsidiary, 100% shareholding by the Group
GC Ventures Co., Ltd.	Thailand	Subsidiary, 100% shareholding
GC Treasury Center Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
GC Styrenics Co., Ltd.	Thailand	Subsidiary, 100% shareholding
GC Estate Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Oxirane Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Solution Creation Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Thai Tank Terminal Limited	Thailand	Subsidiary, 51% shareholding, some common directors and the Company's management as a director
Bio Spectrum Co., Ltd. (Liquidation process finalized in January 2019)	Thailand	Subsidiary, 100% shareholding
PTT Phenol Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC-M PTA Company Limited (Formerly Siam Mitsui PTA Co., Ltd.)	Thailand	Subsidiary, 49% shareholding by the Company and 25% shareholding by subsidiary and the Company's management as a director
NPC Safety and Environmental Service Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Auria BioChemicals Co., Ltd. (Liquidation process finalized in April 2019)	Thailand	Subsidiary, 100% shareholding by the Group
PTTGC America Corporation	United States of America	Subsidiary, 100% shareholding, some common directors and the Company's management as a director
PTTGC International Private Limited	Singapore	Subsidiary, 100% shareholding, some common directors and the Company's management as a director
GGC Biochemicals Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by subsidiary
Thai PET Resin Co., Ltd.	Thailand	Indirect subsidiary, 84.40% shareholding by subsidiaries and the Company's management as a director
Thai Fatty Alcohols Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by subsidiary
PL Global Transport Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
NPC S&E Security Guard Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group
Vencorex (Thailand) Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by indirect subsidiary
GCM Polymer Trading DMCC (Formerly Polymer Marketing DMCC)	United Arab Emirates	Indirect subsidiary, 100% shareholding by the Group
GC Logistics Solutions (Vietnam) Co., Ltd.	Vietnam	Indirect subsidiary, 100% shareholding by the Group
GC Marketing Solutions Myanmar Co., Ltd. (Formerly Polymer Marketing Myanmar Co., Ltd.)	Myanmar	Indirect subsidiary, 100% shareholding by the Group
GC Marketing Solutions Vietnam Co., Ltd. (Formerly Polymer Marketing Vietnam Co., Ltd.)	Vietnam	Indirect subsidiary, 100% shareholding by the Group
GC Ventures America Corporation	United States of America	Indirect subsidiary, 100% shareholding by the Group
PTTGC America LLC	United States of America	Indirect subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director
PTTGC Innovation America Corporation	United States of America	Indirect subsidiary, 100% shareholding by the Group
PTTGC International (Netherlands) B.V.	Netherlands	Indirect subsidiary, 100% shareholding by the Group
PTTGC International (USA) Inc.	United States of America	Indirect subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director
PT GCM Marketing Solutions Indonesia	Indonesia	Indirect subsidiary, 67% shareholding by the Group
Vencorex France S.A.S.	France	Indirect subsidiary, 100% shareholding by indirect subsidiary
Vencorex Holding	France	Indirect subsidiary, 90.82% shareholding by subsidiary
PTT Asahi Chemical Co., Ltd.	Thailand	Joint venture, 50% shareholding and the Company's management as a director
PTT MCC Biochem Co., Ltd.	Thailand	Joint venture, 50% shareholding
HMC Polymers Co., Ltd.	Thailand	Joint venture, 41.44% shareholding and the Company's management as a director

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
GGC KTIS Bioindustrial Company Limited	Thailand	Indirect joint venture, 50% shareholding by subsidiary
Thai Ethoxylate Co., Ltd.	Thailand	Indirect joint venture, 50% shareholding by subsidiary
NatureWorks Asia Pacific Co., Ltd.	Thailand	Indirect joint venture, 50% shareholding by the Group
Emery Oleochemicals (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group and the Company's management as a director
Emery Oleochemicals Marketing (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group
Emery Specialty Chemicals Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group and the Company's management as a director
Emeryoleo Specialties (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group
NatureWorks LLC	United States of America	Indirect joint venture, 50% shareholding by the Group
Matrix Polymers Australia Pty Ltd.	Australia	Indirect joint venture, 49% shareholding by the Group
Matrix Polymers Ltd.	England	Indirect joint venture, 49% shareholding by the Group
Matrix Polymers New Zealand Pty Ltd.	New Zealand	Indirect joint venture, 49% shareholding by the Group
Revolve Group Limited	England	Indirect joint venture, 49% shareholding by the Group
Revolve Matrix Polymers Malaysia Sdn. Bhd.	Malaysia	Indirect joint venture, 49% shareholding by the Group
Global Power Synergy Plc.	Thailand	Associate, 22.73% shareholding, shareholding by parent company, some common directors and the Company's management as a director
Kuraray GC Advanced Materials Company Limited	Thailand	Associate, 33.40% shareholding and the Company's management as a director
PTT Energy Solutions Co., Ltd.	Thailand	Associate, 20% shareholding, shareholding by parent company, some common directors
PTT Digital Solutions Co., Ltd.	Thailand	Associate, 40% shareholding and shareholding by parent company

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
Vinythai Plc.	Thailand	Associate, 24.98% shareholding and the Company's management as a director
Eastern Fluid Transport Co., Ltd.	Thailand	Associate, 15% shareholding by the Company and 15% shareholding by subsidiary
GHECO-One Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow Energy Public Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 2 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 3 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow SPP 11 Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Glow IPP Company Limited	Thailand	Indirect associate, 22.73% shareholding by the Group
Thai Eastern Topseeds Oil Co., Ltd.	Thailand	Indirect associate, 30% shareholding by subsidiary
Combined Heat and Power Producing Co., Ltd.	Thailand	Indirect associate, 22.73% shareholding by the Group
Advanced Biochemical (Thailand) Co., Ltd.	Thailand	Indirect associate, 24.98% shareholding by the Group
S.P. Petpack Inter Group Co., Ltd.	Thailand	Indirect associate, 25% shareholding by the Group
PT Indo Thai Trading	Indonesia	Indirect associate, 49% shareholding by the Group until July 2019
Thai Petroleum Pipeline Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Dhipaya Insurance Plc.	Thailand	Related party, shareholding by parent company
Thai Paraxylene Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Thai Oil Plc.	Thailand	Related party, shareholding by parent company
TOP Solvent Co., Ltd.	Thailand	Related party, indirect shareholding by parent company

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
TOP Solvent (Vietnam) LLC.	Vietnam	Related party, indirect shareholding by parent company
Business Services Alliance Co., Ltd.	Thailand	Related party, shareholding by parent company, the Company and two Company's associates, each of 25% shareholding of preferred stock
PTT Natural Gas Distribution Co., Ltd.	Thailand	Related party, shareholding by parent company
PTT Retail Services Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
PTT Retail Management Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
PTT Oil and Retail Business Plc.	Thailand	Related party, shareholding by parent company
PTTEP Siam Limited	Thailand	Related party, indirect shareholding by parent company
PTTEP International Limited	Thailand	Related party, indirect shareholding by parent company
PTT Exploration and Production Plc.	Thailand	Related party, shareholding by parent company
PTT Tank Terminal Limited	Thailand	Related party, shareholding by parent company
PTT Energy Resources Co., Ltd.	Thailand	Related party, shareholding by parent company
PTT LNG Co., Ltd.	Thailand	Related party, shareholding by parent company
Rak Phasak Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
LABIX Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Sak Chaisidhi Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Sport Services Alliance Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Community Partnership Association	Thailand	The Company's management as a director
Sarn Palung Social Enterprise Company Limited	Thailand	Related party, 15% shareholding and shareholding by parent company

<b>Name of entities</b>	<b>Country of incorporation/ nationality</b>	<b>Nature of relationships</b>
Amata Natural Gas Distribution Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Energy Complex Co., Ltd.	Thailand	Related party, shareholding by parent company
UBE Chemicals (Asia) Plc.	Thailand	Related party, indirect shareholding by parent company
IRPC Plc.	Thailand	Related party, shareholding by parent company
IRPC Polyol Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Carigali-PTTEPI Operating Company Sdn. Bhd.	Malaysia	Related party, indirect shareholding by parent company
PTTEP South Asia Limited	Cayman Islands	Related party, indirect shareholding by parent company
PTT International Trading DMCC	United Arab Emirates	Related party, indirect shareholding by parent company
PTT International Trading London Ltd.	England	Related party, shareholding by parent company and some common directors
PTT International Trading Pte. Ltd.	Singapore	Related party, shareholding by parent company
TPBI & Myanmar Star Co., Ltd.	Myanmar	Related party, shareholding by subsidiary

The pricing policies for particular types of transactions are explained further below:

<b>Transactions</b>	<b>Pricing policies</b>
Sale of goods	Contract price / Regional market price / World market price
Rendering of services	Contract price
Purchase of goods / raw materials / services	Contract price / Market price
Interest on loan	Average cost of fund / Contractually agreed rate
Key management personnel compensation (Meeting allowance and bonus)	The rate approved by the Board of Directors and shareholders

Significant transactions for the years ended December 31, 2019 and 2018 with related parties were as follows:

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>		<u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Parent</b>				
Sales of goods or rendering of services	29,047	124,542	28,886	121,869
Purchases of goods or receiving of services	237,553	310,191	236,347	307,987
Other income	26	76	5	26
Other expense	193	115	129	85
Purchase of assets	-	6,944	-	-
<b>Subsidiaries</b>				
Sales of goods or rendering of services	-	-	99,395	107,775
Purchases of goods or receiving of services	-	-	3,661	3,364
Interest income	-	-	15	16
Dividend income	-	-	2,666	2,912
Other income	-	-	1,144	1,263
Interest expense	-	-	762	427
Other expense	-	-	1,971	2,146
Expense capitalised to fixed assets	-	-	3,164	1,015
<b>Joint ventures</b>				
Sales of goods or rendering of services	7,874	9,199	4,469	4,839
Purchases of goods or receiving of services	3,745	4,042	204	297
Interest income	145	242	143	240
Dividend income	-	-	828	1,242
Other income	96	70	80	63
Other expense	1	2	1	2
<b>Associates</b>				
Sales of goods or rendering of services	5,831	9,684	4,531	5,720
Purchases of goods or receiving of services	12,916	9,635	7,220	4,783
Interest income	163	-	163	-
Dividend income	4	2	871	730
Other income	242	69	150	68
Other expense	459	462	353	342
Expense capitalised to fixed assets	304	122	224	50
<b>Other related parties</b>				
Sales of goods or rendering of services	156,928	127,249	150,458	122,271
Purchases of goods or receiving of services	16,577	22,608	15,312	21,074
Other income	59	182	22	175
Other expense	435	431	335	320
Expense capitalised to fixed assets	40	75	24	67
<b>Key management personnel</b>				
Key management personnel compensation				
Short-term benefits	374	369	193	192
Post-employment benefits and other long-term employee benefits	14	5	12	4
<b>Total key management personnel compensation</b>	<b>388</b>	<b>374</b>	<b>205</b>	<b>196</b>



Balances as at December 31, 2019 and 2018 with related parties were as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b><i>Trade receivables - related parties</i></b>				
Parent	2,265	3,576	2,251	3,554
Subsidiaries	-	-	6,942	9,520
Joint ventures	838	1,192	374	556
Associates	378	716	318	404
Other related parties	13,240	12,117	12,548	11,674
<b>Total</b>	<b>16,721</b>	<b>17,601</b>	<b>22,433</b>	<b>25,708</b>

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b><i>Other receivables - related parties</i></b>				
Parent	38	49	36	42
Subsidiaries	-	-	425	441
Joint ventures	56	52	33	43
Associates	211	284	35	125
Other related parties	655	920	550	780
<b>Total</b>	<b>960</b>	<b>1,305</b>	<b>1,079</b>	<b>1,431</b>

***Loans to related parties***

	<u>Interest rate</u>		<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>(% per annum)</u>		<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b><i>Short-term loans</i></b>						
Subsidiaries	1.80 - 3.93	1.89 - 3.52	-	-	429	607
Joint venture	LIBOR plus margin	LIBOR plus margin	-	242	-	242
Associate	Fixed rate	-	1,123	-	1,123	-
<b>Total</b>			<b>1,123</b>	<b>242</b>	<b>1,552</b>	<b>849</b>

***Long-term loans***

Joint ventures	LIBOR plus margin	LIBOR plus margin	2,275	3,551	2,275	3,551
<b>Total</b>			<b>2,275</b>	<b>3,551</b>	<b>2,275</b>	<b>3,551</b>

***Summary of loans to related parties***

Short-term loans	1,123	242	1,552	849
Long-term loans	2,275	3,551	2,275	3,551
<b>Total</b>	<b>3,398</b>	<b>3,793</b>	<b>3,827</b>	<b>4,400</b>

Movements during the years ended December 31, 2019 and 2018 of loans to related parties were as follows:

*Loans to related parties*

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Short-term loans</b>				
<b>Subsidiaries</b>				
As at January 1,	-	-	607	476
Increase	-	-	-	251
Decrease	-	-	(178)	(120)
<b>As at December 31,</b>	<b>-</b>	<b>-</b>	<b>429</b>	<b>607</b>
<b>Joint venture</b>				
As at January 1,	242	-	242	-
Increase	-	235	-	235
Decrease	(225)	-	(225)	-
Effect of change in exchange rates	(17)	7	(17)	7
<b>As at December 31,</b>	<b>-</b>	<b>242</b>	<b>-</b>	<b>242</b>
<b>Associate</b>				
As at January 1,	-	-	-	-
Increase	8,000	-	8,000	-
Decrease	(6,877)	-	(6,877)	-
<b>As at December 31,</b>	<b>1,123</b>	<b>-</b>	<b>1,123</b>	<b>-</b>
<b>Total</b>				
As at January 1,	242	-	849	476
Increase	8,000	235	8,000	486
Decrease	(7,102)	-	(7,280)	(120)
Effect of change in exchange rates	(17)	7	(17)	7
<b>As at December 31,</b>	<b>1,123</b>	<b>242</b>	<b>1,552</b>	<b>849</b>
<b>Long-term loans</b>				
<b>Joint ventures</b>				
As at January 1,	3,551	6,665	3,551	6,665
Increase	767	-	767	-
Decrease	(1,827)	(3,212)	(1,827)	(3,212)
Effect of change in exchange rates	(216)	98	(216)	98
<b>As at December 31,</b>	<b>2,275</b>	<b>3,551</b>	<b>2,275</b>	<b>3,551</b>
<b>Investments in subsidiaries (Note 10)</b>				
	-	-	72,551	67,783
<b>Investments in joint ventures (Note 11)</b>				
	32,444	30,758	15,373	15,373
<b>Investments in associates (Note 12)</b>				
	29,829	15,450	26,813	9,793

	Unit : Million Baht					
	<u>Consolidated</u>		<u>Separate</u>			
	<u>financial statements</u>		<u>financial statements</u>			
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>		
<b><i>Trade payables - related parties</i></b>						
Parent	17,400	23,678	17,362	23,604		
Subsidiaries	-	-	112	36		
Joint ventures	386	562	11	60		
Associates	1,386	1,817	691	792		
Other related parties	1,555	2,110	1,294	1,655		
<b>Total</b>	<b><u>20,727</u></b>	<b><u>28,167</u></b>	<b><u>19,470</u></b>	<b><u>26,147</u></b>		
<b><i>Other payables - related parties</i></b>						
Parent	90	43	69	20		
Subsidiaries	-	-	1,230	1,121		
Joint ventures	16	7	3	3		
Associates	112	150	77	109		
Other related parties	215	143	196	124		
<b>Total</b>	<b><u>433</u></b>	<b><u>343</u></b>	<b><u>1,575</u></b>	<b><u>1,377</u></b>		
<b><i>Payables to contractors - related parties</i></b>						
Subsidiaries	-	-	1,550	569		
Associates	101	81	94	51		
Other related parties	3	24	3	3		
<b>Total</b>	<b><u>104</u></b>	<b><u>105</u></b>	<b><u>1,647</u></b>	<b><u>623</u></b>		
<b><i>Borrowings from related parties</i></b>						
	Unit : Million Baht					
	<u>Interest rate</u>		<u>Consolidated</u>		<u>Separate</u>	
	<u>(% per annum)</u>		<u>financial statements</u>		<u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b><i>Short-term borrowings</i></b>						
Subsidiaries	1.10	1.10	-	-	3,041	1,931
<b>Total</b>			<b><u>-</u></b>	<b><u>-</u></b>	<b><u>3,041</u></b>	<b><u>1,931</u></b>
<b><i>Long-term borrowing</i></b>						
Subsidiary	4.68	4.68	-	-	14,991	16,105
<b>Total</b>			<b><u>-</u></b>	<b><u>-</u></b>	<b><u>14,991</u></b>	<b><u>16,105</u></b>
<b><i>Summary of borrowings from related parties</i></b>						
Short-term borrowings			-	-	3,041	1,931
Long-term borrowing			-	-	14,991	16,105
<b>Total</b>			<b><u>-</u></b>	<b><u>-</u></b>	<b><u>18,032</u></b>	<b><u>18,036</u></b>

Movements during the years ended December 31, 2019 and 2018 of borrowings from related parties were as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Short-term borrowings</b>				
<b>Subsidiaries</b>				
As at January 1,	-	-	1,931	2,558
Increase	-	-	1,580	105
Decrease	-	-	(470)	(732)
<b>As at December 31,</b>	<b>-</b>	<b>-</b>	<b>3,041</b>	<b>1,931</b>
<b>Long-term borrowing</b>				
<b>Subsidiary</b>				
As at January 1,	-	-	16,105	-
Increase	-	-	-	16,473
Effect of change in exchange rate	-	-	(1,132)	(300)
	-	-	<b>14,973</b>	<b>16,173</b>
Amortise (less) deferred financing cost	-	-	18	(68)
<b>As at December 31,</b>	<b>-</b>	<b>-</b>	<b>14,991</b>	<b>16,105</b>

**Significant agreements with related parties**

The Group has significant agreements with related parties as at December 31, 2019 as follows:

**Olefins Sales and Purchase Agreements**

The Company has 4 Ethylene sales and purchase agreements with a parent company and 2 related parties. Selling prices are determined based on Ethylene price in the world market. These agreements are for the periods from 7 years to 21 years, commencing from the effective date specified in each agreement. One agreement that is expired in July 2020 is automatically renewed except for advance cancellation not less than 1 year through written notice by each party. Other three agreements will expire in December 2021, May 2022 and December 2027.

The Company has 3 Propylene sales and purchase agreements with 3 related parties. Selling prices are determined based on Polypropylene plastic pellets and Propylene prices in the world market. Two agreements are for the periods from 5 years to 11 years, commencing from the effective date specified in each agreement and expiring in December 2021 and December 2026 and another agreement is for the period 15 years, start from the plant commercial operation date.

**By-Product Sales and Purchase Agreements**

The Company has a Hydrogen sales and purchase agreement with 2 related parties. Selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in March 2024 and another agreement is for the period of 15 years, start from the plant commercial operation date or one hundred and eighty (180) days from the first date of counter party's plant start receiving product from the company, whichever occurs earlier.

The Company has a Tail Gas sales and purchase agreement with a related party. Selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in August 2021.

The Company has a Butene sales and purchase agreement with a related party. Selling price in the agreement is determined based on Butene Price in the world market. The agreement is for the period of 1 year, commencing from the date as specified in the agreement and expiring in December 2019.

### ***Utilities and Other Services Agreements***

The Company has 3 Power Supply agreements with 3 related parties. Selling prices in these agreements are determined based on reference price from the Provincial Electricity Authority. These agreements are for the periods of 6 years 8 months and 15 years, commencing from the date as specified in each agreement and expiring in September 2022, June 2027 and September 2028.

The Company has 6 Utilities agreements covering electricity, steam and demineralised water with a related party. These agreements are for the periods from 12 years to 19 years 9 months, commencing from the date as specified in each agreement and expiring in December 2028.

The Company and certain related parties have many Utilities agreements for the industries covering electricity, steam, and water for industrial use with a related party. These agreements are for the periods from 15 years to 20 years, commencing from the date as specified in each agreement and expiring from December 2021 to June 2033 and two agreements are for the period 15 years, start from the plant commercial operation date. All agreements can be renewed for the period of 5 years with the terms and conditions agreed by both parties.

The Company has Tank Farm Storage and Service Agreement with a related party covering tank storage, utilities for product warehouse and transportation of Methanol. This agreement is for the period of 15 years, commencing from the effective date as specified in each agreement and expiring in March 2034, with the service charge as stipulated in the agreement.

### ***Feedstock and Fuel Gas Sales and Purchase Agreements***

The Company has 3 LPG sales and purchase agreements with a parent company. The selling price is determined based on the Polypropylene plastic pellets price. These agreements are for the periods from 8 years 7 months to 15 years, commencing from the date as specified in the agreement. Two agreements will expire in December 2020 and one agreement will expire in May 2021.

The Company has a Natural Gas sales and purchase agreement with a parent company. The selling price is determined based on gas price as specified in the agreement. The agreement is for the period of 20 years, commencing from the date as specified in the agreement. Subsequently, the agreement is renewed for the period of 2 years 3 months and expiring in March 2021.

The Company has 2 Natural Gas sales and purchase agreements with a parent company. Selling prices are determined based on gas price as specified in the agreement and Thailand Producer Price Index as classification of products by activity (CPA). These agreements are for the periods of 10 years, commencing from the date as specified in each agreement and expiring in May 2023 and December 2029.

The Company and 2 related parties have various Natural Gas sales and purchase agreements with a parent company. Selling price in an agreement is determined based on fuel oil prices and Thailand Producer Price Index (PPI). These agreements are for the periods from 10 years to 15 years, commencing from the date as specified in each agreement and expiring from June 2020 to December 2029.

The Company has a Natural Gas Liquid sales and purchase agreement with a parent company. The selling price is determined based on the standard price of Naphtha in the region. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in May 2021. The agreement is renewable for the period of 5 years with the agreement of both parties.

The Company has 2 Ethane, Propane and LPG sales and purchase agreements with a parent company. Selling price in an agreement is determined based on the high density Polyethylene plastic pellets and Polypropylene plastic pellets price and selling price in another agreement is determined based on the high density Polyethylene plastic pellets price. These agreements have been extended and consequently will expire in December 2020.

The Company has 2 Ethane sales and purchase agreement with a parent company. The selling price is determined based on prices prevailing in the high density Polyethylene price in the world market. These agreements are for the periods from 1 year 11 months to 15 years, commencing from the date as specified in the agreements and expiring in December 2020 and January 2025.

The Company has an Ethane Rich Gas sales and purchase agreement with a related party. The selling price is determined based on prevailing prices of Polyethylene and Polypropylene in the region. This agreement is for the period of 10 years and will expire in January 2021.

From August 1, 2012, the Company has entered into the adjustment of the pricing formula in the sales and purchase agreements of petrochemical natural gas feedstock with a parent company.

#### ***Petroleum Product Offtake Agreement***

The Company has a Petroleum Product sales and purchase agreement with a parent company and a related party. For domestic sales, the product price reflects prices prevailing in Thailand for products of a similar quality that are sold in or imported to Thailand. For export sales, the product price reflects the prevailing international spot price for that product. This agreement is for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

#### ***Expansion Phase Product Offtake Agreement***

The Company has an expansion phase product offtake agreement with a parent company and a related party, which a parent company and a related party agree to purchase 100% of the volume of refined petroleum products produce by reforming and upgrading complexes. As specified in the Product Offtake Agreement, at least 50% of such volume will be sold at a competitive domestic market price and the remaining sold at a competitive export market price or other mutually agreed price. The agreement is for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

#### ***Long-term Crude Oil and Other Raw materials Supply Agreements***

The Company entered into 2 supply agreements for crude oil and other raw materials with a parent company, the reference price being based on market price of crude oil and other raw materials. One agreement is for the periods of 18 years, will expire in February 2024 and another agreement is for the periods of 20 years, was automatically renewed and will expire in December 2020. These agreements are automatically renewed except for advance cancellation through written notice by each party.

#### ***Crack Spread Swap Agreements***

The Company has entered into many crack spread swap agreements with a related party to hedge the Company's oil refinery margin. Under the agreements the floating amount of the basket refinery margin, (calculated crack spread based on the Singapore price of refined petroleum products, which are Naphtha, Gasoline, Gasoil, Kerosene and Fuel Oil, against the price of Dubai crude oil), is swapped for a fixed amount of the basket refinery margin for a fixed quantity per month. Under the agreements, the Company shall receive or make payment for the crack spread difference according to terms and conditions stipulated in the agreements.

#### ***Product Spread Swap Agreements***

The Company has entered into many petrochemical product margin spread swap agreements with a related party to hedge the Company's petrochemical margin. Under the agreements the floating amount of the petrochemical margin, (calculated margin spread based on the key markets petrochemical products, Paraxylene, Benzene and other products against the Naphtha price), is swapped for a fixed amount of the petrochemical margin for a fixed quantity per month. Under the agreements, the Company shall receive or make payment of the product spread difference according to terms and conditions stipulated in the agreements.

#### ***Crude Oil Price Hedging Agreements***

The Company has entered into many crude oil price hedging agreements to mitigate price risk with a related party. As at December 31, 2019 and 2018, the Company has no oil volume under the agreements.

### ***Sales and Purchase Aromatics Product Agreements***

The Company, a parent company, related parties and various other companies have entered into many raw material and product sales and purchase agreements. The sales and purchase prices of raw material and product are based on the prices specified in the agreements. These agreements are for the periods from 1 year to 11 years 9 months, commencing from the effective date as specified in each agreement. The agreements will expire from March 2020 to December 2026. Other agreements are automatically renewed except for a cancellation through written notice by each party.

### ***Polyethylene plastic pellets Sales and Purchase Agreements***

The Company and a related party have 2 Polyethylene plastic pellets sales and purchase agreements with another related party. The Company and a related party agrees to sell all Polyethylene plastic pellets to the other related party for distributing to the customers in the market. The Polyethylene pricing structure is linked to the Polyethylene product price that the related party sells to end customers, adjusted by the marketing expenses specified in the agreements. These agreements are for the period of 15 years, commencing from the effective date as specified in each agreement. One agreement will expire in December 2021 and another will expire in June 2023.

### ***Lending and Borrowing Agreements***

The Company has unsecured short-term lending agreements for the period of 3 years through Liquidity Management System (“LMS”) with 7 related parties with the credit facility of Baht 3,000 million, Baht 1,000 million, Baht 800 million, Baht 350 million, Baht 300 million and Baht 80 million. These loans bear interest based on market rate referenced to BIBOR O/N plus interest rate spread.

The Company has an unsecured short-term lending agreement for the period of 1 year with a related party with the credit facility of Baht 8,000 million. This loans bear interest at the fixed rate.

The Company has an unsecured long-term lending agreement for the period of 3.5 years with a related party with the credit facility of USD 238.36 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has a secured long-term lending agreement for the period of 5 years with a related party with the credit facility of USD 7.9 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has an unsecured long-term lending agreement for the period of 2 years with a related party with the credit facility of USD 17 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has unsecured short-term borrowing agreements for the period of 3 years through LMS with 7 related parties with the credit facility of Baht 4,000 million, Baht 2,500 million, Baht 400 million, Baht 200 million, Baht 60 million and Baht 50 million. These loans bear interest based on market rate referenced to BIBOR O/N minus interest rate spread.

The Company has an unsecured long-term borrowing agreement for the period of 4.2 years with a related party with the credit facility of USD 495.89 million. This loan bear interest at the fixed rate.

### ***Service Agreements***

The Company has Shared Service agreements with 24 related parties for the provision of general services. All of these agreements are effective from the date as specified in the agreements and the service charges will be agreed in the fourth quarter of each year.

The Company has a Technical Services agreement with a related party. Under which the Company agreed to obtain certain technical advisory services. The agreement is for the period of 3 years 4 months and will expire in December 2019.

The Company has Management and Engineering agreement, Design, Supply, Construction and Installation agreement, Inspection of Construction, Equipment and Machinery agreement and Management and Maintenance Work agreement with a related party. These agreements are for the periods from 1 year 3 months to 5 years, commencing from the date as specified in the agreements and expiring in June 2023.

The Company has 3 Services agreements to have the right to lay the pipelines for delivery of raw material and product on pipeline structure with a parent company. These agreements are for the period of 15 years from the agreement date and will expire in May 2023, July 2024 and June 2025.

The Company has a Security Service agreement with a related party. Under which the related party agrees to provide security service to asset, employees and visitors in the location of the Company. The agreement is for the period of 2 years and will expire in December 2020.

The Company has a Safety Inspection Service agreement and an Emergency Control Center agreement with a related party. These agreements are for the period from 2 years to 3 years and will expire in December 2020 with service rate as stipulated in the agreement.

The Company has Warehouse Management agreements with a related party. The agreements are for the periods from 1 year to 21 years 3 months and expiring from December 2020 to December 2030.

The Company has a Logistics Services agreement with a related party. The agreement is for the period of 3 years 1 month and will expire in December 2020.

The Company has entered into 2 Information and Communication Technology Service agreements with a related party. Under which the related party agrees to provide Information Technology system maintenance and support services, system structure and data centre management, system supporting and advisory, including system design and development as the Company's requirements. These agreements are for the periods from 1 year to 15 years, commencing from the date as specified in the agreements and expiring in December 2020 and December 2027.

The Company has Share Service agreement for Engineering, Procurement and Construction (EPC) Phase with 2 related parties. The agreement is effective from the date as specified in the agreement for the period of 3 years. This agreement will expire at least 6 months before the completion of EPC Phase and can be terminated by providing not less than 3 months advance written notice to the counter party.

### ***Rental Agreements***

The Company has Office Rental and Service agreement with a related party. The agreement is for the period of 3 years and will expire in September 2021 with rental and service rate and conditions as stipulated in the agreement.

The Company has entered into Land Lease agreement with a parent company to operate jetty and buffer tank farm services. The agreement is for the period of 23 years 6 months, commencing from the date signed in the agreement by both parties, and will expire in December 2037 with land lease rate and condition as specified in the agreement.

The Company has various Land Lease agreements with related parties. These agreements are for the periods from 14 years to 20 years, commencing from the date as specified in the agreements, and expiring from February 2029 to December 2038 with land lease rate and condition as specified in the agreements.

A subsidiary has Land Lease and Office Rental agreements with 4 related parties. These agreements are for the periods from 3 years to 30 years, commencing from the date as specified in the agreements and the renewal of the contract will be subject to negotiation with the counter party.



**28. FINANCIAL INFORMATION BY SEGMENT**

The Group has significant business segments which offer different products and services, and are managed separately. For each of the business segments, the chief operating decision maker (CODM) reviews internal management reports on at least a quarterly basis. The operations in each of the Group's reportable segments have 7 reportable segments as follows;

Segment 1	Refinery
Segment 2	Aromatics
Segment 3	Olefins and Derivatives
Segment 4	Green Chemicals
Segment 5	Performance Materials and Chemicals
Segment 6	Service and Others
Segment 7	Investments in Other Joint Ventures and Associates

Performance information of each reportable segment is measured based on segment profit before finance cost, income tax, depreciation and amortisation which as included in the internal management reports that are reviewed by the Group's CODM. Management believes that using profit before finance cost, income tax, depreciation and amortisation to measure performance is the most relevant in evaluating the results of certain segments relative to other entities that operate within these industries.

Information about reporting segments for the year ended December 31, 2019

	Unit : Million Baht								
	<u>Refinery</u>	<u>Aromatics</u>	<u>Olefins and Derivatives</u>	<u>Green Chemicals</u>	<u>Performance Materials and Chemicals</u>	<u>Service and Others</u>	<u>Investments in Other Joint Ventures and Associates</u>	<u>Elimination</u>	<u>Total</u>
External revenues	175,036	54,653	132,338	12,017	36,769	1,997	-	-	412,810
Inter-segment revenues	17,417	54,549	10,418	1,037	-	6,455	-	(89,876)	-
<b>Total revenues</b>	<b>192,453</b>	<b>109,202</b>	<b>142,756</b>	<b>13,054</b>	<b>36,769</b>	<b>8,452</b>	<b>-</b>	<b>(89,876)</b>	<b>412,810</b>
Cost of sales and rendering of services	(187,844)	(107,204)	(117,865)	(11,795)	(31,026)	(6,289)	-	89,529	(372,494)
Selling and administrative expenses	(913)	(1,728)	(8,314)	(936)	(2,424)	(2,132)	-	1,376	(15,071)
<b>Profit before finance costs, income tax, depreciation and amortisation</b>	<b>4,208</b>	<b>1,042</b>	<b>17,085</b>	<b>604</b>	<b>3,533</b>	<b>1,340</b>	<b>-</b>	<b>(10)</b>	<b>27,802</b>
Interest income	115	69	362	54	63	375	-	(48)	990
Finance costs	(388)	(171)	(450)	(79)	(445)	(1,681)	-	95	(3,119)
Depreciation and amortisation	(2,784)	(3,259)	(9,692)	(519)	(2,727)	(744)	-	212	(19,513)
Reversal of expenses from raw materials derogation	-	-	-	232	-	-	-	-	232
Gain on bargain purchase	-	-	31	-	-	-	-	-	31
Dividend income	-	-	-	-	-	3,538	-	(3,527)	11
Share of profit (loss) of investments in joint ventures	-	-	(73)	60	-	-	2,639	-	2,626
Share of profit (loss) of investments in associates	-	-	(5)	(29)	-	-	1,972	(5)	1,933
Others	(173)	(84)	18	(3)	194	2,051	-	3	2,006
<b>Profit (loss) before income tax</b>	<b>978</b>	<b>(2,403)</b>	<b>7,276</b>	<b>320</b>	<b>618</b>	<b>4,879</b>	<b>4,611</b>	<b>(3,280)</b>	<b>12,999</b>
<b>Profit (loss) for reportable segment Owners of the parent</b>	<b>1,008</b>	<b>(2,381)</b>	<b>7,022</b>	<b>162</b>	<b>395</b>	<b>4,126</b>	<b>4,611</b>	<b>(3,261)</b>	<b>11,682</b>

Information about reporting segments for the year ended December 31, 2018

	Unit : Million Baht								
	<u>Refinery</u>	<u>Aromatics</u>	<u>Olefins and Derivatives</u>	<u>Green Chemicals</u>	<u>Performance Materials and Chemicals</u>	<u>Service and Others</u>	<u>Investments in Other Joint Ventures and Associates</u>	<u>Elimination</u>	<u>Total</u>
External revenues	227,034	92,601	135,126	15,233	46,751	1,910	-	-	518,655
Inter-segment revenues	23,877	53,968	13,134	984	135	3,984	-	(96,082)	-
<b>Total revenues</b>	<b>250,911</b>	<b>146,569</b>	<b>148,260</b>	<b>16,217</b>	<b>46,886</b>	<b>5,894</b>	<b>-</b>	<b>(96,082)</b>	<b>518,655</b>
Cost of sales and rendering of services	(242,617)	(138,697)	(106,392)	(14,618)	(37,677)	(3,969)	-	96,013	(447,957)
Selling and administrative expenses	(786)	(1,656)	(7,173)	(835)	(2,362)	(2,184)	-	1,352	(13,644)
<b>Profit before finance costs, income tax, depreciation and amortisation</b>	<b>7,960</b>	<b>5,750</b>	<b>35,137</b>	<b>859</b>	<b>6,998</b>	<b>1,303</b>	<b>-</b>	<b>256</b>	<b>58,263</b>
Interest income	178	159	462	54	59	322	-	(58)	1,176
Finance costs	(382)	(126)	(642)	(233)	(465)	(1,824)	-	79	(3,593)
Depreciation and amortisation	(3,592)	(3,343)	(8,538)	(529)	(2,925)	(552)	-	199	(19,280)
Expenses from raw materials derogation	-	-	-	(2,004)	-	-	-	-	(2,004)
Gain on bargain purchase	-	-	1,355	-	-	-	-	-	1,355
Dividend income	-	-	-	25	-	4,214	-	(4,202)	37
Share of profit of investments in joint ventures	-	-	-	118	-	-	5,091	-	5,209
Share of profit of investments in associates	-	-	4	(8)	-	-	1,672	18	1,686
Others	12	120	369	22	200	(318)	-	3	408
<b>Profit (loss) before income tax</b>	<b>4,176</b>	<b>2,560</b>	<b>28,147</b>	<b>(1,696)</b>	<b>3,867</b>	<b>3,145</b>	<b>6,763</b>	<b>(3,705)</b>	<b>43,257</b>
<b>Profit (loss) for reportable segment Owners of the parent</b>	<b>4,031</b>	<b>2,269</b>	<b>25,118</b>	<b>(1,056)</b>	<b>4,173</b>	<b>2,467</b>	<b>6,763</b>	<b>(3,696)</b>	<b>40,069</b>

	Unit : Million Baht								
	<u>Refinery</u>	<u>Aromatics</u>	<u>Olefins and Derivatives</u>	<u>Green Chemicals</u>	<u>Performance Materials and Chemicals</u>	<u>Service and Others</u>	<u>Investments in Other Joint Ventures and Associates</u>	<u>Elimination</u>	<u>Total</u>
<b>As at December 31, 2019</b>									
Segment assets	64,704	69,264	162,080	13,289	60,473	94,124	60,904	(72,324)	452,514
Investment in joint ventures and associates	-	-	244	1,125	-	-	60,904	-	62,273
Change in non-current assets (excluding deferred tax assets and derivatives)	1,293	(494)	6,057	(36)	6,142	(1,966)	15,534	(3,235)	23,295
<b>As at December 31, 2018</b>									
Segment assets	72,671	74,561	179,071	14,226	60,628	90,078	45,370	(67,350)	469,255
Investment in joint ventures and associates	-	-	46	792	-	-	45,370	-	46,208
Change in non-current assets (excluding deferred tax assets and derivatives)	(2,362)	(848)	19,245	(135)	7,806	23,135	4,590	(21,696)	29,735

### ***Geographical segments***

In presenting information on the basis of geographical segments, segment revenue from sale of goods and rendering of services for the years ended December 31, 2019 and 2018 are based on the geographical location of customers. Segment non-current assets (exclude derivatives and deferred tax) as at December 31, 2019 and 2018 are based on the geographical location of the assets.

### ***Geographical information***

	<b>Unit: Million Baht</b>	
	<b>Revenues</b>	
	<b><u>2019</u></b>	<b><u>2018</u></b>
Thailand	260,869	316,080
The People's Republic of China	42,994	70,588
Singapore	20,021	34,337
Vietnam	17,278	27,524
Malaysia	13,517	7,292
Indonesia	6,052	7,079
India	5,108	7,150
Japan	4,481	4,589
United States of America	2,786	3,509
Other countries	39,704	40,507
<b>Total</b>	<b><u>412,810</u></b>	<b><u>518,655</u></b>

	<b>Unit: Million Baht</b>	
	<b>Non-current assets (excluding deferred tax assets and derivatives)</b>	
	<b><u>2019</u></b>	<b><u>2018</u></b>
Thailand	324,881	302,864
United States of America	10,242	8,353
France	6,900	7,681
Malaysia	4,505	4,526
Other countries	419	228
<b>Total</b>	<b><u>346,947</u></b>	<b><u>323,652</u></b>

### ***Major customers***

The Group's revenue from sale of goods and rendering of services for the years ended December 31, 2019 and 2018 mainly comprise revenue from one customer of Refinery, Aromatics and Olefins and derivatives segment representing Baht 29,047 million (2018: Baht 124,542 million) and revenue from another customer of Refinery and Green Chemicals segment representing Baht 123,025 million (2018: Baht 69,948 million).

## **29. SELLING AND DISTRIBUTION EXPENSES**

Selling and distribution expenses for the years ended December 31, 2019 and 2018 consisted of:

	<b>Unit : Million Baht</b>			
	<b><u>Consolidated</u></b>		<b><u>Separate</u></b>	
	<b><u>2019</u></b>	<b><u>2018</u></b>	<b><u>2019</u></b>	<b><u>2018</u></b>
Distribution expense	3,534	2,981	1,908	1,882
Promotional expense	97	98	13	19
Marketing expense	109	120	42	56
Personnel expense	191	207	-	-
<b>Total</b>	<b><u>3,931</u></b>	<b><u>3,406</u></b>	<b><u>1,963</u></b>	<b><u>1,957</u></b>

### 30. ADMINISTRATIVE EXPENSES

Administrative expenses for the years ended December 31, 2019 and 2018 consisted of:

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Personnel expense	6,257	5,265	4,401	3,686
Professional and consultancy fee	1,264	1,624	1,100	1,569
Depreciation and amortisation	1,211	1,137	772	690
Loss on disposal of fixed assets	50	23	-	4
Donation	186	155	180	150
Secondment fee	94	65	53	97
Others	3,475	3,180	2,236	2,040
<b>Total</b>	<b>12,537</b>	<b>11,449</b>	<b>8,742</b>	<b>8,236</b>

### 31. EMPLOYEE BENEFITS EXPENSES

Employee benefits expenses for the years ended December 31, 2019 and 2018 consisted of:

	<u>Note</u>	<u>Consolidated</u>		Unit : Million Baht	
		<u>financial statements</u>		<u>Separate</u>	
		<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Salaries, bonus, wages and other welfares		14,714	13,650	8,695	8,556
Contribution to provident funds		630	561	506	472
Defined benefit plans	23	1,418	326	1,111	226
Other long-term employee benefits	23	84	58	45	46
<b>Total</b>		<b>16,846</b>	<b>14,595</b>	<b>10,357</b>	<b>9,300</b>

#### *Defined contribution plans*

The defined contribution plans comprise provident funds established by the Group for its employees. Membership to the funds is on a voluntary basis. Contributions are made monthly by the employees at the minimum rate as required by law not exceeding 15% of their basic salaries and the Group contributes at the minimum rate as required by law not exceeding 15% of the employees' basic salaries. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by a licensed Fund Manager.

### 32. EXPENSES BY NATURE

The statements of income include an analysis of expenses by function. Expenses by nature disclosed in accordance with the requirements of various TFRS were as follows:

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Included in cost of sales of goods</i>				
Changes in finished goods and work in progress	1,677	(810)	1,443	210
Raw materials used	324,740	389,710	254,546	331,200
Personnel expense	10,397	9,123	5,956	5,614
Depreciation of property, plant and equipment	17,352	16,311	12,258	12,217
Amortisation of intangible assets	393	368	280	253
<i>Included in selling and distribution and administrative expenses</i>				
Personnel expense	6,448	5,472	4,401	3,686
Depreciation of property, plant and equipment	839	787	537	479
Amortisation of intangible assets	372	350	235	211
Minimum lease payments recognised as an operating lease expense	667	640	317	328

### 33. FINANCE COSTS

Finance costs for the years ended December 31, 2019 and 2018 consisted of:

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<i>Interest expense</i>				
Subsidiaries	-	-	762	427
Debentures	2,300	2,227	1,646	1,880
Bank loans and overdrafts	1,208	1,154	354	493
Borrowings from other parties	15	168	-	-
<b>Total interest expense</b>	<b>3,523</b>	<b>3,549</b>	<b>2,762</b>	<b>2,800</b>
Other finance costs	331	548	186	319
<u>Less</u> Capitalised as cost of assets under construction	(735)	(504)	(329)	(192)
<b>Net</b>	<b>3,119</b>	<b>3,593</b>	<b>2,619</b>	<b>2,927</b>

34. INCOME TAX EXPENSE

Income tax expense for the years ended December 31, 2019 and 2018 consisted of:

	<u>Consolidated</u>		Unit : Million Baht	
	<u>financial statements</u>		<u>Separate</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b><i>Current tax expense</i></b>				
Current year	800	3,509	281	3,038
(Over) under provided in prior years	(22)	21	(17)	25
	<u>778</u>	<u>3,530</u>	<u>264</u>	<u>3,063</u>
<b><i>Deferred tax expense</i></b>				
Movements in temporary differences	(129)	(544)	(190)	165
<b>Total</b>	<u><b>649</b></u>	<u><b>2,986</b></u>	<u><b>74</b></u>	<u><b>3,228</b></u>

***Reconciliation of effective tax rate***

	<u>Consolidated financial statements</u>		Unit : Million Baht	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
	<i>Rate</i> (%)		<i>Rate</i> (%)	
Profit before income tax expense		12,999		43,257
Income tax using the Thai corporation tax rate	20.0	2,600	20.0	8,651
Effect of different tax rates in foreign Jurisdictions		1		32
Income not subject to tax		(2,207)		(5,995)
Non-deductible tax expenses		278		232
(Over) under provided in prior years		(22)		21
Others		(1)		45
<b>Total</b>	<u><b>5.0</b></u>	<u><b>649</b></u>	<u><b>6.9</b></u>	<u><b>2,986</b></u>

	<u>Separate financial statements</u>		Unit : Million Baht	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
	<i>Rate</i> (%)		<i>Rate</i> (%)	
Profit before income tax expense		9,227		32,949
Income tax using the Thai corporation tax rate	20.0	1,845	20.0	6,590
Income not subject to tax		(1,969)		(3,521)
Non-deductible tax expenses		215		134
(Over) under provided in prior years		(17)		25
<b>Total</b>	<u><b>0.8</b></u>	<u><b>74</b></u>	<u><b>9.8</b></u>	<u><b>3,228</b></u>



### 35. PROMOTIONAL PRIVILEGES

By virtue of the provisions of the Industrial Investment Promotion Act of B.E. 2520, the Company has been granted privileges by the Board of Investment relating to production of upstream, intermediate and downstream petrochemical, utilities and production support facilities, jetty for transportation and storage of liquid product and transportation by marine vessels, production of petroleum product, research and development of polymer products and chemical formula, lab testing services and refinery. The privileges granted include:

- (a) exemption from payment of import duty on machinery approved by the Board;
- (b) exemption from payment of income tax not over 100 percent of investment excluded land and working capital of certain operations for a period of eight years from the date on which the income is first derived from such operations
- (c) a 50% reduction in the normal income tax rate on the net profit derived from certain operations for a period of five years, commencing from the expiry date in (b) above.

As promoted companies, the Company must comply with certain terms and conditions prescribed in the promotional certificates.

Summary of revenues from promoted and non-promoted businesses in separate financial statement for the years ended December 31, 2019 and 2018 were as follows:

	Unit : Million Baht					
	<u>Separate financial statements</u>					
	2019			2018		
	Promoted businesses	Non- promoted businesses	Total	Promoted businesses	Non- promoted businesses	Total
Export sales	2,027	28,176	30,203	2,927	52,985	55,912
Domestic sales	22,397	298,356	320,753	22,614	377,607	400,221
Services income	-	591	591	1	580	581
<b>Total revenue</b>	<b><u>24,424</u></b>	<b><u>327,123</u></b>	<b><u>351,547</u></b>	<b><u>25,542</u></b>	<b><u>431,172</u></b>	<b><u>456,714</u></b>

Certain subsidiaries in the Group have been granted promotional privileges as same as the Company.

### 36. BASIC EARNINGS PER SHARE

The calculation of basic earnings per share for the years ended December 31, 2019 and 2018 were based on the profit for the years attributable to ordinary shareholders of the Company and the weighted average number of ordinary shares outstanding during the years as follows:

	Unit : Million Baht / Million shares			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>	<u>financial statements</u>	<u>financial statements</u>	<u>financial statements</u>
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
Profit attributable to ordinary shareholders of the parent company (basic)	11,682.08	40,069.49	9,153.08	29,720.82
Number of ordinary shares as at January 1,	4,508.85	4,508.85	4,508.85	4,508.85
Effect of treasury stock	(2.59)	-	(2.59)	-
Weighted average number of ordinary shares (basic)	<u>4,506.26</u>	<u>4,508.85</u>	<u>4,506.26</u>	<u>4,508.85</u>
<b>Earnings per share (basic) (in Baht)</b>	<b><u>2.59</u></b>	<b><u>8.89</u></b>	<b><u>2.03</u></b>	<b><u>6.59</u></b>

### 37. DIVIDENDS PAID

At the Annual General Meeting of the shareholders of the Company held on April 5, 2019, the shareholders approved the appropriation of annual dividend from 2018 performance at Baht 4.25 per share, amounting to Baht 19,163 million. The Company had paid interim dividend of the first half year of 2018 at Baht 1.75 per share, amounting to Baht 7,890 million on September 18, 2018. The remaining dividend was paid for the second half year of 2018 at Baht 2.50 per share, amounting to Baht 11,272 million. Such dividend was paid to the shareholders in April 2019.

At the Board of Directors' Meeting of the Company held on August 19, 2019, the Board approved the appropriation of interim dividends from the earnings from January 1, 2019 to June 30, 2019 at Baht 1 per share. The dividend amounting to Baht 4,508 million was paid to the rightful shareholders in September 2019.

At the Annual General Meeting of the shareholders of the Company held on April 9, 2018, the shareholders approved the appropriation of annual dividend from 2017 performance at Baht 4.25 per share, amounting to Baht 19,087 million. The Company had paid interim dividend of the first half year of 2017 at Baht 1.75 per share, amounting to Baht 7,815 million on September 18, 2017. The remaining dividend was paid for the second half year of 2017 at Baht 2.50 per share, amounting to Baht 11,272 million. Such dividend was paid to the shareholders in April 2018.

At the Board of Directors' Meeting of the Company held on August 20, 2018, the Board approved the appropriation of interim dividends from the earnings from January 1, 2018 to June 30, 2018 at Baht 1.75 per share. The dividend amounting to Baht 7,890 million was paid to the rightful shareholders in September 2018.

### 38. FINANCIAL INSTRUMENTS

#### *Financial risk management policies*

The Group is exposed to normal business risks from changes in market interest rates and currency exchange rates and from non-performance of contractual obligations by counterparties. The Group does not hold or issue derivative financial instruments for speculative or trading purposes.

Risk management is integral to the whole business of the Group. The management continually monitors the Group's risk management process to ensure that an appropriate balance between risk and control is achieved.

#### *Capital management*

The Company's Board of Directors' policy is to maintain a strong capital base so as to maintain investor, creditor, partners and other stakeholders. In addition, the Board monitors the return on capital and the level of dividends to ensure business sustainability.

#### *Interest rate risk*

Interest rate risk is the risk that future movements in market interest rates will affect the results of the Group's operations and its cash flows because the Group's finances loans which have both floating and fixed interest rates for their operations. The Group has managed this risk to ensure the appropriateness to the business operation.

The effective interest rates of interest-bearing liabilities at December 31, 2019 and 2018 and the periods in which those liabilities mature or re-price were disclosed in note 20 to the financial statements.

#### *Foreign currency risk*

The Group is exposed to foreign currency risk relating to purchases, sales, and construction payment, including borrowings which are denominated in foreign currencies. The Group primarily utilises forward exchange contracts to hedge such financial assets and liabilities denominated in foreign currencies. The forward exchange contracts entered into at the reporting date also relate to anticipated purchases and sales, denominated in foreign currencies, for the subsequent period.

As at December 31, 2019 and 2018, the Group was exposed to foreign currency risk in respect of financial assets and liabilities denominated in the following currencies:

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>		<u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>USD</b>				
Financial assets	16,536	39,624	12,680	32,913
Financial liabilities	(21,295)	(24,515)	(34,681)	(37,282)
<b>Gross statement of financial position exposure</b>	<b>(4,759)</b>	<b>15,109</b>	<b>(22,001)</b>	<b>(4,369)</b>
<b>Currency forward contracts</b>	<b>4,199</b>	<b>14,780</b>	<b>3,122</b>	<b>5,225</b>

The Group performs foreign currency risk management on assets and liabilities held in USD. The Group has net liabilities under USD currency. The Group manages net USD liabilities by naturally hedged USD portion of net profit to minimise the impact from fluctuations in foreign currency to the Group's performance.

In addition to forward exchange contracts, the Group uses derivatives financial instruments, principally currency swaps and interest rate swap, to manage exposure to fluctuations in interest rates and in exchange rates. As at December 31, 2019, the Group entered into interest rate swap contracts, totalling Baht 0.48 million (2018: Baht 4.00 million) to repay certain interest bearing liabilities in foreign currencies.

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>		<u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>EUR</b>				
Financial assets	46	170	-	18
Financial liabilities	(85)	(240)	(41)	(59)
<b>Gross statement of financial position exposure</b>	<b>(39)</b>	<b>(70)</b>	<b>(41)</b>	<b>(41)</b>
<b>Currency forward contracts</b>	<b>6</b>	<b>18</b>	<b>-</b>	<b>-</b>

	Unit : Million Baht			
	<u>Consolidated</u>		<u>Separate</u>	
	<u>financial statements</u>		<u>financial statements</u>	
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Others</b>				
Financial assets	29	393	1	1
Financial liabilities	(60)	(158)	(43)	(68)
<b>Gross statement of financial position exposure</b>	<b>(31)</b>	<b>235</b>	<b>(42)</b>	<b>(67)</b>
<b>Currency forward contracts</b>	<b>377</b>	<b>748</b>	<b>-</b>	<b>-</b>

#### **Credit risk**

Credit risk is risk of failure from a customer or a counterparty to settle its obligations to the Group as and when they fall due.

Management has a policy in place and the exposure to credit risk is monitored on an ongoing basis. Credit evaluations are performed on all customers requiring credit over a certain amount. At the reporting date, there were no significant concentrations of credit risk. The maximum exposure to credit risk is represented by the carrying amount of each financial asset in the statement of financial position. However, the majority of the customers are on the long-term contracted commitment and parts of them are the Company's shareholders which the company has consistently collected from them. For the customers who do not have the long-term contracted commitments, the Group monitors the risk on an ongoing basis and would do the business only with the credible customers by limiting the credit lines and requesting the guarantee on some cases. For the export, the credit of counterparty will be considered. The Group will demand a payment on a case to case basis and also has commercial credit insurance. Management does not anticipate material losses from its debt collection.

**Liquidity risk**

The Group monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Group's operations and to mitigate the effects of fluctuations in cash flows.

**Carrying amount and fair values**

The carrying value of financial assets and liabilities in the consolidated and separate statements of financial position as at December 31, 2019 and 2018 are approximated to fair values except the following items:

	Unit : Million Baht						
	<u>Consolidated financial statements</u>						<u>Total</u>
	<u>Carrying value</u>			<u>Fair value</u>			
	<u>Current</u>	<u>Non-current</u>	<u>Total</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	
<b>As at December 31, 2019</b>							
<b>Financial assets</b>							
Debt securities							
available-for-sale	545	1,503	2,048	-	2,048	-	2,048
Equity securities							
available-for-sale	-	384	384	384	-	-	384
Financial derivatives	28	-	28	-	28	-	28
Commodity derivatives	194	-	194	-	194	-	194
<b>Financial liabilities</b>							
Debentures	-	70,131	70,131	-	72,477	-	72,477
Financial derivatives	320	12	332	-	332	-	332
Commodity derivatives	466	-	466	-	466	-	466
<b>As at December 31, 2018</b>							
<b>Financial assets</b>							
Debt securities							
available-for-sale	6,315	5,957	12,272	-	12,272	-	12,272
Equity securities							
available-for-sale	-	362	362	362	-	-	362
Financial derivatives	341	122	463	-	463	-	463
Commodity derivatives	67	-	67	-	67	-	67
<b>Financial liabilities</b>							
Debentures	1,942	52,408	54,350	-	55,290	-	55,290
Financial derivatives	311	147	458	-	458	-	458
Commodity derivatives	308	-	308	-	308	-	308

Unit : Million Baht

	<u>Separate financial statements</u>						
	<u>Carrying value</u>			<u>Fair value</u>			
	<u>Current</u>	<u>Non-current</u>	<u>Total</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	<u>Total</u>
<b>As at December 31, 2019</b>							
<b><i>Financial assets</i></b>							
Debt securities							
available-for-sale	545	1,503	2,048	-	2,048	-	2,048
Equity securities							
available-for-sale	-	384	384	384	-	-	384
Financial derivatives	14	-	14	-	14	-	14
Commodity derivatives	194	-	194	-	194	-	194
<b><i>Financial liabilities</i></b>							
Long-term borrowing							
from a related party	-	14,991	14,991	-	15,808	-	15,808
Debentures	-	55,221	55,221	-	56,761	-	56,761
Financial derivatives	69	12	81	-	81	-	81
Commodity derivatives	466	-	466	-	466	-	466
<b>As at December 31, 2018</b>							
<b><i>Financial assets</i></b>							
Debt securities							
available-for-sale	6,315	5,957	12,272	-	12,272	-	12,272
Equity securities							
available-for-sale	-	362	362	362	-	-	362
Financial derivatives	340	122	462	-	462	-	462
Commodity derivatives	67	-	67	-	67	-	67
<b><i>Financial liabilities</i></b>							
Long-term borrowings							
from a related party	-	16,105	16,105	-	16,530	-	16,530
Debentures	1,942	36,379	38,321	-	39,082	-	39,082
Financial derivatives	3	21	24	-	24	-	24
Commodity derivatives	308	-	308	-	308	-	308

***Measurement of fair values***

Level 1 of fair values for equity securities available-for-sale investments are based on quoted bid price as at the end of reporting period by references from the Stock Exchange of Thailand.

Level 2 of fair values for debt securities available-for-sale investments are based on the yield rate quoted by the Thai Bond Market Association or other markets and for simple over-the-counter derivative instruments are based on broker quotes. Those quotes are tested for reasonableness by discounting expected future cash flows using market interest rate for a similar instrument at the measurement date. Fair values reflect the credit risk of the instrument and include adjustments to take account of the credit risk of the Group and counterparty when appropriate. For fixed-rate long-term borrowings are based on discounted future cash flows for the remaining periods using market interest rate for a similar instrument at the measurement date. For debentures are based on the last bid price on the Thai Bond Market Association at the measurement date.

### 39. COMMITMENTS WITH NON-RELATED PARTIES

As at December 31, 2019 and 2018, the Company and its subsidiaries had commitments with non-related parties as follows:

	<u>Consolidated</u>		<u>Unit : Million Baht</u>	
	<u>financial statements</u>	<u>financial statements</u>	<u>Separate</u>	<u>Separate</u>
	<u>2019</u>	<u>2018</u>	<u>2019</u>	<u>2018</u>
<b>Capital commitments</b>				
<i>contracted but not provided for</i>				
Land	5	2	2	2
Plant, machinery and equipment	13,475	31,460	9,084	19,006
Buildings	107	38	98	36
Others	627	617	228	199
<b>Total</b>	<b>14,214</b>	<b>32,117</b>	<b>9,412</b>	<b>19,243</b>
<b>Non-cancellable operating lease commitments</b>				
Within one year	602	195	286	121
After one year but within five years	1,467	888	795	649
After five years	2,459	2,402	1,957	2,097
<b>Total</b>	<b>4,528</b>	<b>3,485</b>	<b>3,038</b>	<b>2,867</b>
<b>Other commitments</b>				
Letters of credits	333	383	-	-
Bank guarantees	3,336	2,043	1,467	266
Guarantees for credit facilities and bank guarantees	2,613	2,784	22,661	25,002
Other agreements	8,699	9,524	7,214	9,047
<b>Total</b>	<b>14,981</b>	<b>14,734</b>	<b>31,342</b>	<b>34,315</b>

As at December 31, 2019 and 2018, the Company and a subsidiary had capital commitments as follows:

- The Company had commitments relating to Olefins Reconfiguration Project totalling Baht 6,074 million (2018: Baht 16,125 million). The project has been planned for commercial operation within 2020.
- A subsidiary had commitments relating to Propylene Oxide (PO) Project totalling Baht 2,940 million (2018: Baht 9,013 million). The project has been planned for commercial operation within 2020.

#### Utilities and Other Services Agreements with minimum purchase quantity

The Group has 17 utilities and other services agreements which have minimum purchase quantity with other parties. These agreements are for the periods from 10 years to 30 years, commencing from the date as specified in each agreement and expiring in March 2022 to September 2035. The minimum purchase quantity, the selling price of products and the renewal of the contract will be subject as specified in the agreements.

#### 40. LITIGATIONS

##### a) Purchase and sales of raw materials agreement legal case

On December 3, 2009, a company filed for arbitration against PTT Plc. (“PTT”) and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 13,805 million. On March 8, 2010, the dispute was struck out of the case-list by the arbitration ruling that the Company was not a party to the contract.

On August 27, 2010, the said company filed a civil suit to the Civil Court against PTT and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 9,380 million. In this regards, the Company filed an objection against the indictment with the Civil Court on the basis that the Company was not a party to the contract.

On May 21, 2013, the Civil Court considered that the arbitration process between such company and PTT has not yet finalized; therefore, the Court has temporarily struck the case out of the case-list until the final decision has been reached under arbitration process. Then, both parties or either party can resubmit the case to the Civil Court for the further trial.

Subsequently, on March 25, 2016, the arbitration has reached a conclusion for PTT to compensate the damages in some amount. On June 30, 2019, PTT submitted a motion for setting aside the arbitral award to the Civil Court. Thereafter, on September 19, 2019, the Civil Court rendered the judgement for enforcement of the arbitral award, however, PTT will appeal to the Supreme Court under applicable law. The Company believes that the outcome of the consideration will not result in any liability to the Company, because the arbitral award and the judgement shall not be enforced on the Company due to the fact that the Company was not the party in the case, therefore, has not provided any provision against any loss that may result from this matter in the financial statements.

##### b) Oil spill incident legal case

During the third quarter of 2014, the number of people in Rayong filed several lawsuits with the Civil Court and the Rayong Provincial Court against the Company to claim the extra compensation from oil spill incident and to perform the rehabilitation of the sea and natural environmental recovery. Some cases have been dismissed and some cases have been passed a judgement by the Civil Court on August 25, 2016 by ordered the Company to compensate for damages including interest and rehabilitation of approximately Baht 11.26 million. The Company has appealed on February 17, 2017. Subsequently, on May 11, 2018, the Company made a compromise agreement with majority plaintiffs at the Civil Court. On December 20, 2018, the Court of Appeal has passed the judgement according to the compromise contracts which the Company has already paid compensation in full amount. For the remaining plaintiffs, the Court of Appeal ordered the Company to pay compensation with its interest according to the judgement of the Court of First Instance and reduced the amount of interest. The Company has paid the compensation to all plaintiffs completely and no petition is submitted to Supreme Court by any plaintiffs. This case has become final.

For the case at Rayong Provincial Court, on September 28, 2018, the Court has made the judgement ordering the Company to pay damage cost with its interest of approximately Bath 38 million by deducting the remedy payment paid to the plaintiffs of Baht 24 million. The Company deposited the remaining damage cost with its interest to the Rayong Provincial Court on February 25, 2019. Some plaintiffs filed an appeal with the Rayong Provincial Court and the Company has filed an answer to the appeal with the Rayong Provincial Court on October 2, 2019. Subsequently, on January 22, 2020 the Rayong Provincial Court sent an appointment to hear the judgment of the Court of Appeal Region 2 on March 19, 2020.

**c) Transfer of right for the payment of raw materials legal case of the subsidiary**

- c.1) The subsidiary was informed by the third party who received the transfer of claim from the supplier of the subsidiary for the payment of raw materials, which the supplier of the subsidiary borrowed from the third party to purchase raw materials to sell to the subsidiary and the subsidiary had to pay for the raw materials to that third party under the transfer of right for the payment of raw materials. After reviewing the provided documents, the subsidiary informed to the third party that these documents were not in the system, nor there was no evidence regarding the delivery of raw materials as prescribed in the documents. Subsequently, on August 20, 2018, the third party filed a civil lawsuit against the supplier of the subsidiary and the subsidiary as joint defendants for violation of loan agreement and transfer of claim, with damage claimed amounting to Baht 308.75 million with interest rate at 15% per annum amounting to Baht 15.90 million, totalling Baht 324.65 million. The subsidiary appointed a lawyer and filed a statement of defense. Currently, this case is in the process of the plaintiffs and defendants witness hearing. However, the legal advisor of the subsidiary provided an opinion that the subsidiary is not liable for any damages as per the plaint as there was no evidence regarding the delivering of raw materials to the subsidiary. As a result, there is no obligation.
- c.2) On February 27, 2019, a financial institution filed a civil lawsuit against the supplier of the subsidiary, director of supplier of the subsidiary and the subsidiary as joint defendants for violation of credit limit agreement, sale of promissory notes, transfer of money, guarantee and forced mortgage, with damage claimed amounting to Baht 55.95 million and interest amounting to Baht 3.49 million, totalling Baht 59.44 million. Therefore, the subsidiary filed a statement of defense. On October 28, 2019, the plaintiff submitted the motion for permission to withdraw the pliant against the subsidiary and the Court granted such permission and struck the case out of the case-list of the Court.

**41. RECLASSIFICATIONS**

Certain reclassifications have been made to the consolidated and separate financial statements for the year ended December 31, 2018, to conform to the classifications used in the consolidated and separate financial statements for the year ended December 31, 2019 as follows:

Account name	Previous presentation	Current presentation	Unit : Million Baht	
			Consolidated financial statements	Separate financial statements
Land	Property, plant and equipment	Investment properties	977	1,741
Other assets	Other non-current assets	Property, plant and equipment	6,286	4,580

**42. EVENTS AFTER THE REPORTING PERIOD**

- 42.1 The Company has established a Joint Venture company called ENVICCO Limited (ENVICCO) on February 3, 2020 to operate High-quality recycled plastic plant which the Company holds 70% of total shares in Joint Venture company together with another 30% held by ALPLA. The establishment of ENVICCO is in accordance with the resolution of Board of Directors' meeting No. 8/2019 on July 22, 2019 approving the Company to enter into the Joint Venture Agreement (JVA) to invest in Recycle plastic plant project. The Joint Venture company has the objectives to manufacture and distribute rPET and rHDPE recycled plastic resins with overall production capacity of 45,000 Ton per year comprised of rPET capacity of 30,000 Ton per year and rHDPE capacity of 15,000 Ton per year. The project will be located at Asia Industrial Estate in Rayong province and has expected commercial operation date within the fourth quarter of 2021.
- 42.2 At the Board of Directors' meeting held on February 17, 2020, the Board approved to submit for approval at the Annual General Meeting of the Shareholders, a full year 2019 dividend payment at the rate of Baht 2.00 per share, of which Baht 1.00 per share was paid as an interim dividend in September 2019 as disclosed in note 37. Thus, the remaining dividend will be paid at the rate of Baht 1.00 per share to the shareholders entitled to receive dividends. This dividend is subject to the approval of the Shareholders at the Annual General Meeting to be held on April 9, 2020.



**43. APPROVAL OF THE FINANCIAL STATEMENTS**

These financial statements have been approved for issue by the Board of Directors on February 17, 2020.

## **Independent Auditor’s Report**

### **To the Shareholders of PTT Global Chemical Public Company Limited**

#### *Opinion*

I have audited the consolidated and separate financial statements of PTT Global Chemical Public Company Limited and its subsidiaries (the “Group”) and of PTT Global Chemical Public Company Limited (the “Company”), respectively, which comprise the consolidated and separate statements of financial position as at 31 December 2018, the consolidated and separate statements of income and comprehensive income, changes in equity and cash flows for the year then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

In my opinion, the accompanying consolidated and separate financial statements present fairly, in all material respects, the financial position of the Group and the Company, respectively, as at 31 December 2018 and their financial performance and cash flows for the year then ended in accordance with Thai Financial Reporting Standards (TFRSs).

#### *Basis for Opinion*

I conducted my audit in accordance with Thai Standards on Auditing (TSAs). My responsibilities under those standards are further described in the *Auditor’s Responsibilities for the Audit of the Consolidated and Separate Financial Statements* section of my report. I am independent of the Group and the Company in accordance with the Code of Ethics for Professional Accountants issued by the Federation of Accounting Professions that is relevant to my audit of the consolidated and separate financial statements, and I have fulfilled my other ethical responsibilities in accordance with these requirements. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

## Key Audit Matters

Key audit matters are those matters that, in my professional judgment, were of most significance in my audit of the consolidated and separate financial statements of the current period. These matters were addressed in the context of my audit of the consolidated and separate financial statements as a whole, and in forming my opinion thereon, and I do not provide a separate opinion on these matters.

<b>Acquisitions of businesses</b>	
Refer to Notes 3 (a) and 5 to the financial statements.	
<b>The key audit matter</b>	<b>How the matter was addressed in the audit</b>
<p>On 27 December 2018, the Group completed the acquisitions of 2 investments in subsidiaries in Purified Terephthalic Acid and Polyethylene Terephthalate resin business resulting in the recording of gains on bargain purchases in the consolidated statement of income for the year ended 31 December 2018.</p> <p>The acquisition method of accounting for business combinations is a complex, requiring the Group to determine the fair value of assets acquired and liabilities assumed and consideration transferred with any resulting differences recognised as goodwill or a gain on bargain purchase.</p> <p>Due to the significant of the transactions and the complexities involved in determining the fair value of assets acquired and liabilities assumed, I considered accounting for business acquisition as a key audit matter.</p>	<p>My audit procedures included the following:</p> <ul style="list-style-type: none"><li>• Read the sale and purchase agreement to understand key terms and conditions;</li><li>• Evaluated the appropriateness of the identification of assets acquired and liabilities assumed at the acquisition date including understanding on the procedures on identification of fair value which was prepared by the management;</li><li>• Evaluated the independence and competency of independent asset appraiser of the Group;</li><li>• Evaluated significant assumptions underpinning the valuations reference to internal and external information and mathematical accuracy;</li><li>• Use the work of expert engaged by KPMG in evaluating methodologies and key assumptions of the valuation;</li><li>• Evaluated the adequacy of the disclosures in accordance with the relevant Thai Financial Reporting Standards.</li></ul>

<b>Valuation and existence of inventories</b>	
Refer to Notes 3(g), 4 and 10 to the financial statements.	
<b>The key audit matter</b>	<b>How the matter was addressed in the audit</b>
<p>Inventory is valued at the lower of its cost and net realisable value. As a result of fluctuation in crude oil price may cause the net realisable value to be lower than its cost. The measurement of inventories together with their net realisable values are based on assumptions about the production yield of crude oil.</p> <p>In addition, during the second quarter of 2018, a subsidiary has found that the quantity of raw materials in the system was higher than actual quantity at the storage facilities of the suppliers. In consequence, the Group has recognized expenses from raw materials derogation amounting to Baht 2,004 million (owners of the parent net of tax amounting to Baht 1,261 million).</p> <p>I considered this as a key audit matter.</p>	<p>My audit procedures included the following:</p> <ul style="list-style-type: none"> <li>● Enquiring with management on procurement, issue and storage of raw materials process and implementation of controls over the process as well as randomly test the operating effectiveness of controls;</li> <li>● Read the factual investigation report regarding the procurement and distribution process of raw materials, the fraud investigation report, the internal control report on procurement of raw materials and the related minutes of meeting of the board of directors;</li> <li>● Attend the physical inventory count, send the inventory confirmation letter for inventories at the storage facilities of the suppliers and reconciling confirmations with the accounting records;</li> <li>● Assessed assumptions used in the key measurement of inventory by evaluating the production assumptions and comparing to the actual production in the past and randomly tested the selling price of each finished goods with reference to current market prices;</li> <li>● Tested the calculation of net realisable value of inventories.</li> <li>● Randomly examined the supporting documents;</li> <li>● Evaluated the adequacy of the disclosures in accordance with the relevant Thai Financial Reporting Standards.</li> </ul>

### *Emphasis of Matter*

I draw attention to note 5 to the financial statements, the Group completed the acquisitions of 2 investments in subsidiaries resulting in the recording gains on bargain purchases in the consolidated statement of income for the year ended 31 December 2018. The fair value of business acquired and the allocation of purchase price have been provisionally determined and are subject to potential amendment. My opinion is not modified in respect of this matter.

### *Other Information*

Management is responsible for the other information. The other information comprises the information included in the annual report, but does not include the consolidated and separate financial statements and my auditor's report thereon.

My opinion on the consolidated and separate financial statements does not cover the other information and I will not express any form of assurance conclusion thereon.

In connection with my audit of the consolidated and separate financial statements, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the consolidated and separate financial statements or my knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work I have performed, I conclude that there is a material misstatement of this other information, I am required to report that fact. I have nothing to report in this regard.

### *Responsibilities of Management and Those Charged with Governance for the Consolidated and Separate Financial Statements*

Management is responsible for the preparation and fair presentation of the consolidated and separate financial statements in accordance with TFRSs, and for such internal control as management determines is necessary to enable the preparation of consolidated and separate financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated and separate financial statements, management is responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group and the Company or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Group's and the Company's financial reporting process.

### *Auditor's Responsibilities for the Audit of the Consolidated and Separate Financial Statements*

My objectives are to obtain reasonable assurance about whether the consolidated and separate financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with TSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated and separate financial statements.

As part of an audit in accordance with TSAs, I exercise professional judgment and maintain professional skepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the consolidated and separate financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's and the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's and the Company's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the consolidated and separate financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Group and the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated and separate financial statements, including the disclosures, and whether the consolidated and separate financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. I am responsible for the direction, supervision and performance of the group audit. I remain solely responsible for my audit opinion.

I communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

I also provide those charged with governance with a statement that I have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on my independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, I determine those matters that were of most significance in the audit of the consolidated and separate financial statements of the current period and are therefore the key audit matters. I describe these matters in my auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, I determine that a matter should not be communicated in my report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

(Charoen Phosamritlert)  
Certified Public Accountant  
Registration No. 4068

KPMG Phoomchai Audit Ltd.  
Bangkok  
18 February 2019

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Statement of financial position

	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
Assets		2018	2017	2018	2017
<i>(in Baht)</i>					
<b>Current assets</b>					
Cash and cash equivalents	7	36,744,040,127	43,429,391,977	27,141,980,258	34,435,521,847
Current investments	13	16,817,920,867	11,620,341,737	10,011,153,767	8,937,841,737
Trade accounts receivable	6, 8	41,990,677,039	41,696,848,016	34,832,891,357	34,957,003,232
Other receivables	6, 9	3,624,987,347	2,959,208,230	2,776,875,934	2,776,629,990
Inventories	10	39,365,633,468	37,754,918,812	29,105,102,076	29,071,922,068
Short-term loans to related parties	6	242,136,000	-	848,799,510	476,034,886
Short-term loans to other parties		665,367,833	-	-	-
Receivable from Oil Fuel Fund		819,672,983	751,741,364	819,672,983	751,741,364
Value-added tax receivable		2,193,555,033	1,209,173,466	627,187,239	-
Derivatives	36	340,523,311	133,511,482	339,827,672	126,082,592
Other current assets		1,505,500,947	1,182,451,180	1,204,055,609	974,645,265
<b>Total current assets</b>		<b>144,310,014,955</b>	<b>140,737,586,264</b>	<b>107,707,546,405</b>	<b>112,507,422,981</b>
<b>Non-current assets</b>					
Investments in subsidiaries	6, 11	-	-	67,782,813,121	56,858,727,503
Investments in joint ventures	6, 12	30,757,746,490	27,577,183,336	15,372,927,810	15,372,927,810
Investments in associates	6, 12	15,450,398,109	14,001,546,169	9,792,804,660	9,322,699,660
Other long-term investments	13	7,146,165,871	10,274,865,759	6,806,191,293	9,991,989,242
Long-term loans to related parties	6	3,551,328,000	6,665,493,000	3,551,328,000	6,665,493,000
Long-term loans to other parties		-	670,106,429	-	-
Investment properties	14	5,522,482,407	-	-	-
Property, plant and equipment	15	245,021,402,875	219,688,698,105	171,651,276,252	165,997,946,625
Land leasehold right	16	234,181,354	323,932,996	234,181,354	323,932,996
Goodwill	17	931,328,672	931,328,672	-	-
Intangible assets	18	8,055,084,199	7,768,494,092	5,603,820,101	5,290,974,666
Derivatives	36	122,469,564	1,133,482	122,469,564	1,133,482
Deferred tax assets	19	1,171,330,392	309,107,686	-	-
Other non-current assets		6,981,414,457	6,014,451,540	4,989,066,345	4,336,432,147
<b>Total non-current assets</b>		<b>324,945,332,390</b>	<b>294,226,341,266</b>	<b>285,906,878,500</b>	<b>274,162,257,131</b>
<b>Total assets</b>		<b>469,255,347,345</b>	<b>434,963,927,530</b>	<b>393,614,424,905</b>	<b>386,669,680,112</b>

The accompanying notes are an integral part of these financial statements.



# PTT Global Chemical Public Company Limited and its Subsidiaries

## Statement of financial position

	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
Liabilities and equity		2018	2017	2018	2017
		<i>(in Baht)</i>			
<b>Current liabilities</b>					
Short-term loans from financial institutions	20	3,343,116,790	263,463,734	-	-
Trade accounts payable	6, 21	34,515,941,639	31,137,032,511	27,459,926,202	26,450,571,031
Other payables	6, 22	15,867,926,247	13,522,571,669	11,712,990,634	11,335,502,774
Payables to contractors	6	9,127,020,070	2,157,593,433	5,191,027,808	1,637,668,922
Short-term loans from related parties	6, 20	-	-	1,930,884,839	2,558,006,526
Current portion of long-term loans					
from financial institutions	20	7,046,779,688	9,292,754,135	4,305,696,000	6,835,344,000
Current portion of long-term loans					
from other parties	20	927,744,204	669,374,118	-	-
Current portion of debentures	20, 36	1,942,000,000	-	1,942,000,000	-
Income tax payable		665,994,033	2,421,170,849	473,886,450	2,154,263,817
Derivatives	36	310,771,095	715,734,181	2,871,113	137,783,625
Current provisions		65,762,666	99,404,348	-	-
Other current liabilities		45,197,792	33,783,794	-	-
<b>Total current liabilities</b>		<b>73,858,254,224</b>	<b>60,312,882,772</b>	<b>53,019,283,046</b>	<b>51,109,140,695</b>
<b>Non-current liabilities</b>					
Long-term loans from related party	6, 20	-	-	16,105,004,749	-
Long-term loans from financial institutions	20	30,915,455,205	31,820,572,241	10,113,474,702	14,423,215,179
Long-term loans from other parties	20	323,961,074	1,122,433,964	-	-
Debentures	20, 36	52,408,085,202	54,644,795,574	36,379,430,264	54,644,795,574
Deferred tax liabilities	19	2,746,711,153	1,839,865,302	1,788,503,320	1,610,730,739
Non-current provisions for employee benefits	23	4,283,089,819	4,010,707,568	3,015,279,364	2,831,669,846
Derivatives	36	146,534,450	-	20,581,971	-
Other non-current provisions		494,903,862	464,945,102	-	-
Other non-current liabilities		596,144,422	483,627,551	336,086,298	340,352,706
<b>Total non-current liabilities</b>		<b>91,914,885,187</b>	<b>94,386,947,302</b>	<b>67,758,360,668</b>	<b>73,850,764,044</b>
<b>Total liabilities</b>		<b>165,773,139,411</b>	<b>154,699,830,074</b>	<b>120,777,643,714</b>	<b>124,959,904,739</b>

The accompanying notes are an integral part of these financial statements.

**PTT Global Chemical Public Company Limited and its Subsidiaries**

**Statement of financial position**

	Note	Consolidated financial statements		Separate financial statements	
		31 December		31 December	
Liabilities and equity		2018	2017	2018	2017
<i>(in Baht)</i>					
<b>Equity</b>					
Share capital	24				
Authorised share capital		45,088,491,170	45,088,491,170	45,088,491,170	45,088,491,170
Issued and paid-up share capital		45,088,491,170	45,088,491,170	45,088,491,170	45,088,491,170
Share premium		36,936,829,684	36,936,829,684	36,936,829,684	36,936,829,684
Share premium on treasury shares	25	1,386,740,109	1,386,740,109	1,386,740,109	1,386,740,109
Difference arising from business combination					
under common control	25	1,690,706,891	1,690,706,891	77,453,518	77,453,518
Retained earnings					
Appropriated					
Legal reserve	25	4,512,930,269	4,512,930,269	4,512,930,269	4,512,930,269
Loan repayment reserve		807,802,564	807,802,564	807,802,564	807,802,564
Projects expansion reserve		12,446,994,126	12,446,994,126	12,446,994,126	12,446,994,126
Unappropriated		192,959,190,549	172,015,687,267	171,114,157,807	160,555,120,605
Other components of equity		216,077,207	(16,464,972)	465,381,944	(102,586,672)
<b>Equity attributable to owners of the parent</b>		<b>296,045,762,569</b>	<b>274,869,717,108</b>	<b>272,836,781,191</b>	<b>261,709,775,373</b>
Non-controlling interests		7,436,445,365	5,394,380,348	-	-
<b>Total equity</b>		<b>303,482,207,934</b>	<b>280,264,097,456</b>	<b>272,836,781,191</b>	<b>261,709,775,373</b>
<b>Total liabilities and equity</b>		<b>469,255,347,345</b>	<b>434,963,927,530</b>	<b>393,614,424,905</b>	<b>386,669,680,112</b>

The accompanying notes are an integral part of these financial statements.

**PTT Global Chemical Public Company Limited and its Subsidiaries**

**Statement of income**

	Note	Consolidated financial statements		Separate financial statements	
		For the year ended 31 December		For the year ended 31 December	
		2018	2017	2018	2017
		<i>(in Baht)</i>			
Revenues from sale of goods and rendering of services	6	518,654,742,421	439,920,745,943	456,714,288,455	378,722,244,152
Cost of sale of goods and rendering of services	6	(466,025,790,273)	(382,271,196,272)	(418,114,455,761)	(331,604,782,611)
<b>Gross profit</b>		<b>52,628,952,148</b>	<b>57,649,549,671</b>	<b>38,599,832,694</b>	<b>47,117,461,541</b>
Investment income	6	1,577,303,108	945,697,441	6,284,765,652	6,370,363,096
Other income	6	1,117,147,616	1,418,241,285	2,049,607,521	1,751,679,395
Gain on bargain purchases	5	1,354,901,971	-	-	-
Selling and distribution expenses	6, 27	(3,405,829,379)	(3,056,178,110)	(1,957,010,454)	(1,738,599,888)
Administrative expenses	6, 28	(11,448,544,361)	(11,140,628,972)	(8,235,597,296)	(7,721,084,582)
Expenses from raw materials derogation	4	(2,003,572,583)	-	-	-
Loss from impairment of assets	11, 15, 17, 18	-	(2,296,219,775)	(729,567,425)	(4,720,383,021)
Net derivative gain (loss)		122,019,087	(198,236,984)	65,021,626	(342,332,830)
Net foreign exchange gain (loss)		13,073,207	1,024,365,703	(200,854,878)	1,343,469,076
Finance costs	6, 31	(3,593,353,668)	(3,935,049,416)	(2,927,274,215)	(3,072,187,725)
Share of profit of investments in joint ventures	12	5,208,691,184	4,110,647,538	-	-
Share of profit of investments in associates	12	1,686,140,092	1,460,922,849	-	-
<b>Profit before income tax expense</b>		<b>43,256,928,422</b>	<b>45,983,111,230</b>	<b>32,948,923,225</b>	<b>38,988,385,062</b>
Tax expense	32	(2,985,954,248)	(3,863,252,511)	(3,228,105,397)	(3,465,441,780)
<b>Profit for the year</b>		<b>40,270,974,174</b>	<b>42,119,858,719</b>	<b>29,720,817,828</b>	<b>35,522,943,282</b>
<b>Profit attributable to:</b>					
Owners of the Company		40,069,490,129	39,298,309,631	29,720,817,828	35,522,943,282
Former shareholder before business restructuring		-	2,369,790,494	-	-
Non-controlling interests		201,484,045	451,758,594	-	-
<b>Profit for the year</b>		<b>40,270,974,174</b>	<b>42,119,858,719</b>	<b>29,720,817,828</b>	<b>35,522,943,282</b>
<b>Basic earnings per share</b>	34	<b>8.89</b>	<b>8.79</b>	<b>6.59</b>	<b>7.94</b>

The accompanying notes are an integral part of these financial statements.

PTT Global Chemical Public Company Limited and its Subsidiaries

Statement of comprehensive income

	Consolidated financial statements		Separate financial statements		
	For the year ended 31 December		For the year ended 31 December		
	Note	2018	2017	2018	2017
			<i>(in Baht)</i>		
<b>Profit for the year</b>		<b>40,270,974,174</b>	<b>42,119,858,719</b>	<b>29,720,817,828</b>	<b>35,522,943,282</b>
<b>Other comprehensive income (loss)</b>					
<i>Components of other comprehensive income that will be reclassified to profit or loss</i>					
Exchange differences on translating financial statements		(138,916,708)	(463,605,102)	-	-
Gains (losses) on remeasuring available-for-sale investments		(90,402,521)	162,484,979	(90,402,521)	162,484,979
Gains (losses) on cash flow hedges		807,423,355	(753,189,044)	658,371,137	(207,931,358)
Share of other comprehensive income (losses) of joint ventures	12	(399,462,671)	513,821,226	-	-
Share of other comprehensive income of associates	12	13,701,315	28,434,680	-	-
<b>Total components of other comprehensive income that will be reclassified to profit or loss</b>		<b>192,342,770</b>	<b>(512,053,261)</b>	<b>567,968,616</b>	<b>(45,446,379)</b>
<i>Components of other comprehensive income that will not be reclassified to profit or loss</i>					
Gains (losses) on remeasurements of defined benefit plans		20,353,699	(459,926,590)	-	(383,377,148)
Share of other comprehensive income (loss) of joint ventures	12	25,893,879	(47,166,128)	-	-
Share of other comprehensive income (loss) of associates	12	(8,585,329)	(7,954,944)	-	-
<b>Total components of other comprehensive income that will not be reclassified to profit or loss</b>		<b>37,662,249</b>	<b>(515,047,662)</b>	<b>-</b>	<b>(383,377,148)</b>
<b>Other comprehensive income (loss) for the year, net of tax</b>		<b>230,005,019</b>	<b>(1,027,100,923)</b>	<b>567,968,616</b>	<b>(428,823,527)</b>
<b>Total comprehensive income for the year</b>		<b>40,500,979,193</b>	<b>41,092,757,796</b>	<b>30,288,786,444</b>	<b>35,094,119,755</b>
<b>Total comprehensive income attributable to:</b>					
Owners of parent		40,337,826,087	38,128,591,842	30,288,786,444	35,094,119,755
Former shareholder before business restructuring		-	2,521,020,087	-	-
Non-controlling interests		163,153,106	443,145,867	-	-
<b>Total comprehensive income for the year</b>		<b>40,500,979,193</b>	<b>41,092,757,796</b>	<b>30,288,786,444</b>	<b>35,094,119,755</b>

The accompanying notes are an integral part of these financial statements.

PTT Global Chemical Public Company Limited and its Subsidiaries

Statement of changes in equity

		Consolidated financial statements																		
		Retained earnings								Other components of shareholders' equity										
Note	Issued and paid share capital	Treasury shares	Share premium	Share premium on treasury shares	Difference arising from business combination under common control	Legal reserve	Loans repayment reserve	Projects expansion reserve	Treasury shares reserve	Unappropriated	Translating financial operations (in Baht)	Gain (losses) on remeasuring available-for-sale investments	Gain (losses) on cash flow hedges	Share of other comprehensive income (loss) of joint ventures	Share of other comprehensive income (loss) of associates	Total other components of equity	Equity attributable to owners of parent	Former shareholder before business restructuring	Non-controlling interests	Total equity
<b>Year ended 31 December 2017</b>																				
	<b>45,088,491,170</b>	<b>(2,409,544,289)</b>	<b>36,936,829,684</b>	<b>7,490,764</b>	<b>(1,658,035,683)</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>2,409,544,289</b>	<b>147,220,167,889</b>	<b>85,091,912</b>	<b>(20,398,751)</b>	<b>(36,741,542)</b>	<b>645,471,666</b>	<b>(20,344,315)</b>	<b>653,078,970</b>	<b>246,015,749,753</b>	<b>18,330,742,219</b>	<b>2,667,045,159</b>	<b>267,013,537,131</b>
<b>Transactions with owners, recorded directly in equity</b>																				
<i>Distributions to owner of the parent</i>																				
	-	2,409,544,289	-	1,379,249,345	-	-	-	-	(2,409,544,289)	2,409,544,289	-	-	-	-	-	-	3,788,793,634	-	-	3,788,793,634
35	-	-	-	-	-	-	-	-	-	(15,844,641,990)	-	-	-	-	-	-	(15,844,641,990)	-	(531,354,408)	(16,375,996,398)
	<b>-</b>	<b>2,409,544,289</b>	<b>-</b>	<b>1,379,249,345</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(2,409,544,289)</b>	<b>(13,435,097,701)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(12,055,848,356)</b>	<b>-</b>	<b>(531,354,408)</b>	<b>(12,587,202,764)</b>
<i>Changes in ownership interests in subsidiaries</i>																				
11	-	-	-	-	-	-	-	-	-	(582,931,911)	(14,794,976)	-	-	-	-	(14,794,976)	(597,726,887)	-	(346,469,449)	(944,196,336)
11	-	-	-	-	-	-	-	-	-	1,302,886	-	-	-	-	-	-	1,302,886	-	135,184,564	136,487,450
11	-	-	-	-	-	-	-	-	-	28,905,296	-	-	-	-	-	-	28,905,296	-	3,026,828,615	3,055,733,911
	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(552,723,729)</b>	<b>(14,794,976)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(14,794,976)</b>	<b>(567,518,705)</b>	<b>-</b>	<b>2,815,543,730</b>	<b>2,248,025,025</b>
<i>Changes in interests from business restructuring</i>																				
	-	-	-	-	3,348,742,574	-	-	-	-	-	-	-	-	-	-	-	3,348,742,574	(20,851,762,306)	-	(17,503,019,732)
	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3,348,742,574</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3,348,742,574</b>	<b>(20,851,762,306)</b>	<b>-</b>	<b>(17,503,019,732)</b>
	<b>-</b>	<b>2,409,544,289</b>	<b>-</b>	<b>1,379,249,345</b>	<b>3,348,742,574</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(2,409,544,289)</b>	<b>(13,987,821,430)</b>	<b>(14,794,976)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(14,794,976)</b>	<b>(9,274,624,487)</b>	<b>(20,851,762,306)</b>	<b>2,284,189,322</b>	<b>(27,842,197,471)</b>
<b>Comprehensive income (loss) for the year</b>																				
	-	-	-	-	-	-	-	-	-	39,298,309,631	-	-	-	-	-	-	39,298,309,631	2,369,790,494	451,758,594	42,119,858,719
	-	-	-	-	(514,968,823)	-	-	-	-	(514,968,823)	(454,182,193)	162,484,979	(753,189,044)	361,702,612	28,434,680	(654,748,966)	(1,169,717,789)	151,229,593	(8,612,727)	(1,027,100,923)
	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>38,783,340,808</b>	<b>(454,182,193)</b>	<b>162,484,979</b>	<b>(753,189,044)</b>	<b>361,702,612</b>	<b>28,434,680</b>	<b>(654,748,966)</b>	<b>38,128,591,842</b>	<b>2,521,020,087</b>	<b>443,145,867</b>	<b>41,092,757,796</b>
	<b>45,088,491,170</b>	<b>-</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>1,690,706,891</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>-</b>	<b>172,015,687,267</b>	<b>(383,885,257)</b>	<b>142,086,228</b>	<b>(789,930,586)</b>	<b>1,007,174,278</b>	<b>8,090,365</b>	<b>(16,464,972)</b>	<b>274,869,717,108</b>	<b>-</b>	<b>5,394,380,348</b>	<b>280,264,097,456</b>
<b>Year ended 31 December 2018</b>																				
	<b>45,088,491,170</b>	<b>-</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>1,690,706,891</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>-</b>	<b>172,015,687,267</b>	<b>(383,885,257)</b>	<b>142,086,228</b>	<b>(789,930,586)</b>	<b>1,007,174,278</b>	<b>8,090,365</b>	<b>(16,464,972)</b>	<b>274,869,717,108</b>	<b>-</b>	<b>5,394,380,348</b>	<b>280,264,097,456</b>
<b>Transactions with owners, recorded directly in equity</b>																				
<i>Distributions to owner of the parent</i>																				
35	-	-	-	-	-	-	-	-	-	(19,161,780,626)	-	-	-	-	-	-	(19,161,780,626)	-	(577,303,184)	(19,739,083,810)
	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(19,161,780,626)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(19,161,780,626)</b>	<b>-</b>	<b>(577,303,184)</b>	<b>(19,739,083,810)</b>
<i>Changes in ownership interests in subsidiaries</i>																				
5, 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,363,403,595	2,363,403,595
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92,811,500	92,811,500
	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2,456,215,095</b>	<b>2,456,215,095</b>
	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(19,161,780,626)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(19,161,780,626)</b>	<b>-</b>	<b>1,878,911,911</b>	<b>(17,282,868,715)</b>
<b>Comprehensive income (loss) for the year</b>																				
	-	-	-	-	-	-	-	-	-	40,069,490,129	-	-	-	-	-	-	40,069,490,129	-	201,484,045	40,270,974,174
	-	-	-	-	-	-	-	-	-	35,793,779	(96,351,209)	(90,402,521)	805,057,265	(399,462,671)	13,701,315	232,542,179	268,335,958	-	(38,330,939)	230,005,019
	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>40,105,283,908</b>	<b>(96,351,209)</b>	<b>(90,402,521)</b>	<b>805,057,265</b>	<b>(399,462,671)</b>	<b>13,701,315</b>	<b>232,542,179</b>	<b>40,337,826,087</b>	<b>-</b>	<b>163,153,106</b>	<b>40,500,979,193</b>
	<b>45,088,491,170</b>	<b>-</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>1,690,706,891</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>-</b>	<b>192,959,190,549</b>	<b>(480,236,466)</b>	<b>51,683,707</b>	<b>15,126,679</b>	<b>607,711,607</b>	<b>21,791,680</b>	<b>216,077,207</b>	<b>296,045,762,569</b>	<b>-</b>	<b>7,436,445,365</b>	<b>303,482,207,934</b>

The accompanying notes are an integral part of these financial statements.

**PTT Global Chemical Public Company Limited and its Subsidiaries**

**Statement of changes in equity**

Note	Separate financial statements													
						Retained earnings					Other components of shareholders' equity			
	Issued and paid share capital	Treasury shares	Share premium	Share premium on treasury shares	Difference arising from business combination under common control	Legal reserve	Loans repayment reserve	Projects expansion reserve	Treasury shares reserve	Unappropriated	Gain (losses) on			Total equity
											available-for-sale investments	cash flow hedges	Total other components of equity	
<i>(in Baht)</i>														
<b>Year ended 31 December 2017</b>														
<b>Balance at 1 January 2017</b>	<b>45,088,491,170</b>	<b>(2,409,544,289)</b>	<b>36,936,829,684</b>	<b>7,490,764</b>	<b>480,500,000</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>2,409,544,289</b>	<b>138,850,652,172</b>	<b>(20,398,751)</b>	<b>(36,741,542)</b>	<b>(57,140,293)</b>	<b>239,074,550,456</b>
<b>Transactions with owners, recorded directly in equity</b>														
<i>Distributions to owners of the Company</i>														
Sale of treasury shares	-	2,409,544,289	-	1,379,249,345	-	-	-	-	(2,409,544,289)	2,409,544,289	-	-	-	3,788,793,634
Dividends to owners of the Company	35	-	-	-	-	-	-	-	-	(15,844,641,990)	-	-	-	(15,844,641,990)
<b>Total distributions to owners of the Company</b>	<b>-</b>	<b>2,409,544,289</b>	<b>-</b>	<b>1,379,249,345</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(2,409,544,289)</b>	<b>(13,435,097,701)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(12,055,848,356)</b>
<i>Changes in interests from business restructuring</i>														
Impact of business restructuring	-	-	-	-	(403,046,482)	-	-	-	-	-	-	-	-	(403,046,482)
<b>Total changes in interests from business restructuring</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(403,046,482)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(403,046,482)</b>
<b>Total transactions with owners, recorded directly in equity</b>	<b>-</b>	<b>2,409,544,289</b>	<b>-</b>	<b>1,379,249,345</b>	<b>(403,046,482)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(2,409,544,289)</b>	<b>(13,435,097,701)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(12,458,894,838)</b>
<b>Comprehensive income (loss) for the year</b>														
Profit	-	-	-	-	-	-	-	-	-	35,522,943,282	-	-	-	35,522,943,282
Other comprehensive income (loss)	-	-	-	-	-	-	-	-	-	(383,377,148)	162,484,979	(207,931,358)	(45,446,379)	(428,823,527)
<b>Total comprehensive income (loss) for the year</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>35,139,566,134</b>	<b>162,484,979</b>	<b>(207,931,358)</b>	<b>(45,446,379)</b>	<b>35,094,119,755</b>
<b>Balance at 31 December 2017</b>	<b>45,088,491,170</b>	<b>-</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>77,453,518</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>-</b>	<b>160,555,120,605</b>	<b>142,086,228</b>	<b>(244,672,900)</b>	<b>(102,586,672)</b>	<b>261,709,775,373</b>
<b>Year ended 31 December 2018</b>														
<b>Balance at 1 January 2018</b>	<b>45,088,491,170</b>	<b>-</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>77,453,518</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>-</b>	<b>160,555,120,605</b>	<b>142,086,228</b>	<b>(244,672,900)</b>	<b>(102,586,672)</b>	<b>261,709,775,373</b>
<b>Transactions with owners, recorded directly in equity</b>														
<i>Distributions to owners of the Company</i>														
Dividends to owners of the Company	35	-	-	-	-	-	-	-	-	(19,161,780,626)	-	-	-	(19,161,780,626)
<b>Total distributions to owners of the Company</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(19,161,780,626)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(19,161,780,626)</b>
<b>Total transactions with owners, recorded directly in equity</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(19,161,780,626)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(19,161,780,626)</b>
<b>Comprehensive income (loss) for the year</b>														
Profit	-	-	-	-	-	-	-	-	-	29,720,817,828	-	-	-	29,720,817,828
Other comprehensive income (loss)	-	-	-	-	-	-	-	-	-	-	(90,402,521)	658,371,137	567,968,616	567,968,616
<b>Total comprehensive income (loss) for the year</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>29,720,817,828</b>	<b>(90,402,521)</b>	<b>658,371,137</b>	<b>567,968,616</b>	<b>30,288,786,444</b>
<b>Balance at 31 December 2018</b>	<b>45,088,491,170</b>	<b>-</b>	<b>36,936,829,684</b>	<b>1,386,740,109</b>	<b>77,453,518</b>	<b>4,512,930,269</b>	<b>807,802,564</b>	<b>12,446,994,126</b>	<b>-</b>	<b>171,114,157,807</b>	<b>51,683,707</b>	<b>413,698,237</b>	<b>465,381,944</b>	<b>272,836,781,191</b>

The accompanying notes are an integral part of these financial statements.

**PTT Global Chemical Public Company Limited and its Subsidiaries**

**Statement of cash flows**

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	For the year ended 31 December		For the year ended 31 December	
	2018	2017	2018	2017
	<i>(in Baht)</i>			
<b><i>Cash flows from operating activities</i></b>				
Profit for the year	40,270,974,174	42,119,858,719	29,720,817,828	35,522,943,282
<i>Adjustments for</i>				
Depreciation and amortisation	19,054,766,596	19,450,785,937	13,926,079,334	14,240,330,975
Investment income	(1,577,303,108)	(945,697,441)	(6,284,765,652)	(6,370,363,096)
Finance costs	3,593,353,668	3,935,049,416	2,927,274,215	3,072,187,725
Unrealised (gain) loss on derivative	136,879,945	(224,340,459)	118,341,564	(213,058,305)
Unrealised (gain) loss on exchange	(334,981,690)	(2,940,426,690)	(281,407,352)	(3,032,735,152)
(Reversal of) bad and doubtful debt expenses	11,218,974	(18,544,833)	-	-
Loss from written-off of assets	40,372,959	78,368,227	13,065,025	65,495,291
(Reversal of) losses on inventories devaluation	1,346,625,546	(12,535,433)	1,330,081,525	-
Expenses from raw materials derogation	2,003,572,583	-	-	-
Loss on impairment of assets	-	2,296,219,775	729,567,425	4,720,383,020
Loss on disposal of property, plant and equipment	22,408,748	472,100,362	3,553,332	355,200,203
Provision for employee benefits	383,910,976	483,451,117	272,715,440	347,063,749
Realised deferred pipeline income and equipment and other income	(6,559,468)	(5,553,843)	(7,862,360)	(6,856,736)
Gain on bargain purchases	(1,354,901,971)	-	-	-
Share of profit of investments in joint ventures, net of tax expense	(5,208,691,184)	(4,110,647,538)	-	-
Share of profit of investments in associates, net of tax expense	(1,686,140,092)	(1,460,922,849)	-	-
Tax expense	2,985,954,248	3,863,252,511	3,228,105,397	3,465,441,780
	<u>59,681,460,904</u>	<u>62,980,416,978</u>	<u>45,695,565,721</u>	<u>52,166,032,736</u>

The accompanying notes are an integral part of these financial statements.

**PTT Global Chemical Public Company Limited and its Subsidiaries**

**Statement of cash flows**

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	For the year ended 31 December		For the year ended 31 December	
	2018	2017	2018	2017
	<i>(in Baht)</i>			
<b><i>Cash flows from operating activities (continue)</i></b>				
<i>Changes in operating assets and liabilities</i>				
Trade accounts receivable	1,972,547,646	(3,878,776,109)	50,941,794	(644,600,060)
Other receivables	(2,194,830,878)	910,375,604	286,080,901	455,798,383
Inventories	(917,999,476)	613,270,808	(1,376,326,558)	(2,877,414,849)
Value-added tax receivable	(955,024,742)	179,013,441	(820,811,688)	-
Other current assets	(550,809,553)	(972,648,074)	(297,467,041)	(833,872,282)
Other non-current assets	55,416,788	42,308,241	(109,972,896)	41,813,698
Trade accounts payable	1,860,866,374	2,644,282,969	1,011,331,784	2,566,532,062
Other payables	193,161,182	3,428,240,381	(108,196,027)	3,483,421,668
Current provisions	(29,593,048)	(136,966,151)	-	-
Other current liabilities	11,177,391	(13,497,520)	-	-
Non-current provisions for employee benefits	(150,305,564)	(180,672,040)	(89,105,922)	(83,657,575)
Other non-current provisions	54,072,970	(8,682,547)	-	-
Other non-current liabilities	(121,866,769)	(19,547,570)	2,226,848	(15,105,616)
Net cash generated from operating	58,908,273,225	65,587,118,411	44,244,266,916	54,258,948,165
Taxes paid	(5,279,263,371)	(3,631,882,330)	(4,743,628,244)	(3,106,447,170)
<b>Net cash from operating activities</b>	<b>53,629,009,854</b>	<b>61,955,236,081</b>	<b>39,500,638,672</b>	<b>51,152,500,995</b>
<b><i>Cash flows from investing activities</i></b>				
Interest received	922,850,661	798,717,604	786,413,438	722,256,362
Dividends received	2,399,301,624	3,435,719,653	4,893,350,060	5,500,774,450
Acquisition of investment properties	(5,523,531,948)	-	-	-
Acquisition of property, plant and equipment	(26,156,311,877)	(15,637,761,330)	(14,653,309,304)	(9,879,598,901)
Proceeds from sale of property, plant and equipment	94,672,013	32,893,064	93,880,905	21,844,549
Acquisition of intangible assets	(1,016,175,888)	(729,386,072)	(777,243,580)	(505,687,032)
Acquisition of other non-current assets	(1,604,304,847)	(2,625,924,412)	(1,077,732,369)	(2,223,435,844)
(Increase) decrease in current investments	(1,814,924,783)	3,489,423,199	2,304,291,452	5,198,577,042
(Increase) decrease in available-for-sale securities	187,747,103	(5,163,662,114)	187,747,103	(5,163,662,114)
Acquisition of other long-term investments	(530,948,062)	(1,875,000)	(473,850,000)	(1,875,000)
Proceed from sale of other long-term investments	246,395,861	-	246,395,861	-
Increase in short-term loans to related parties	(234,817,500)	-	(485,469,576)	(886,034,886)
Proceeds from repayment of short-term loans to related parties	-	-	120,023,452	1,065,000,000
Increase in long-term loan to related party	-	(8,461,650,425)	-	(8,461,650,425)
Proceeds from repayment of long-term loan to related parties	3,212,377,500	1,127,928,297	3,212,377,500	1,127,928,297
Proceeds from capital pay back of subsidiaries	-	-	40,700,000	113,440
Acquisition of investment in subsidiaries, joint ventures and associates (net)	(3,023,883,732)	(17,809,320,079)	(11,454,800,880)	(21,374,127,184)
<b>Net cash used in investing activities</b>	<b>(32,841,553,875)</b>	<b>(41,544,897,615)</b>	<b>(17,037,155,938)</b>	<b>(34,859,577,246)</b>

The accompanying notes are an integral part of these financial statements.



**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Statement of cash flows**

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	For the year ended 31 December		For the year ended 31 December	
<i>Note</i>	2018	2017	2018	2017
	<i>(in Baht)</i>			
<b><i>Cash flows from financing activities</i></b>				
Finance costs paid	(3,403,044,412)	(3,801,195,904)	(2,887,032,853)	(3,010,335,432)
Dividends paid	(19,739,083,810)	(16,500,996,398)	(19,161,780,626)	(15,844,641,990)
Repayment of finance lease liabilities	(152,762,836)	(185,986,789)	(122,484,066)	(125,139,768)
Proceeds from short-term loans from financial institutions	18,524,232,681	182,600,154	16,452,870,311	-
Proceeds from short-term loans from related parties	-	-	105,299,204	1,059,906,592
Proceeds from long-term loans from financial institutions	14,438,870,000	7,371,460,962	-	4,974,989,995
Proceeds from long-term loans from related party	-	-	16,472,854,839	-
Proceeds from long-term loans from other parties	127,959,729	57,095,474	-	-
Repayment of short-term loans from financial institutions	(18,388,851,664)	(486,595,503)	(16,452,870,311)	-
Repayment of short-term loans from related parties	-	-	(732,420,891)	(15,696,036)
Repayment of long-term loans from financial institutions	(18,069,061,020)	(10,248,229,100)	(6,793,400,000)	(7,843,400,000)
Repayment of long-term loans from other parties	(746,806,619)	(65,310,503)	-	-
Proceeds from change in ownership interest in subsidiary without a change in control	-	3,192,221,361	-	-
Proceeds from increase in investment in subsidiary from non-controlling interests	92,811,500	-	-	-
Proceeds from debentures	16,371,246,158	9,985,105,044	-	9,985,105,044
Repayment of debentures	(16,452,870,311)	(2,800,000,000)	(16,452,870,311)	(2,800,000,000)
Proceeds from sale of treasury shares	-	3,788,793,634	-	3,788,793,634
<b>Net cash used in financing activities</b>	<b>(27,397,360,604)</b>	<b>(9,511,037,568)</b>	<b>(29,571,834,704)</b>	<b>(9,830,417,961)</b>
Net increase (decrease) in cash and cash equivalents, before effect of exchange rates	(6,609,904,625)	10,899,300,898	(7,108,351,970)	6,462,505,788
Effect of exchange rate changes on cash and cash equivalents	(75,447,225)	(190,294,172)	(185,189,619)	23,354,272
<b>Net increase (decrease) in cash and cash equivalents</b>	<b>(6,685,351,850)</b>	<b>10,709,006,726</b>	<b>(7,293,541,589)</b>	<b>6,485,860,060</b>
Cash and cash equivalents at 1 January	43,429,391,977	32,720,385,251	34,435,521,847	27,949,661,787
<b>Cash and cash equivalents at 31 December</b>	<b>36,744,040,127</b>	<b>43,429,391,977</b>	<b>27,141,980,258</b>	<b>34,435,521,847</b>

The accompanying notes are an integral part of these financial statements.

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

<b>Note</b>	<b>Contents</b>
1	General information
2	Basis of preparation of the financial statements
3	Significant accounting policies
4	Expenses from raw materials derogation
5	Acquisitions of businesses
6	Related parties
7	Cash and cash equivalents
8	Trade accounts receivable
9	Other receivables
10	Inventories
11	Investments in subsidiaries
12	Investments in joint ventures and associates
13	Other investments
14	Investment properties
15	Property, plant and equipment
16	Land leasehold right
17	Goodwill
18	Intangible assets
19	Deferred tax
20	Interest-bearing liabilities
21	Trade accounts payable
22	Other payables
23	Non-current provisions for employee benefits
24	Share capital
25	Additional paid-in capital and reserves
26	Segment information
27	Selling and distribution expenses
28	Administrative expenses
29	Employee benefit expenses
30	Expenses by nature
31	Finance costs
32	Income tax expense
33	Promotional privileges
34	Basic earnings per share
35	Dividends
36	Financial instruments
37	Commitments with non-related parties
38	Litigations
39	Thai Financial Reporting Standards (TFRS) not yet adopted
40	Events after the reporting period

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

These notes form an integral part of the financial statements.

The financial statements issued for Thai statutory and regulatory reporting purposes are prepared in the Thai language. These English language financial statements have been prepared from the Thai language statutory financial statements and, were approved and authorised for issue by the Board of Directors on 18 February 2019.

## 1 General information

PTT Global Chemical Public Company Limited, the “Company”, was registered on 19 October 2011 in accordance with the Public Company Limited Act, B.E. 2535 (1992).

The Board of Governors of the SET approved the listing of the Company on the day that the Registrar accepted the registration on 19 October 2011.

The Company is a company in the PTT Public Company Limited (“PTT”) group of companies. PTT is incorporated in Thailand and is the major shareholder of the Company, holding 48.18% of the Company’s issued and paid-up share capital.

The Company is incorporated in Thailand and has its registered offices as follows:

Head Office	: 555/1, Energy Complex, Building A, 14th - 18th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand
Branch 1 (Rayong office Branch)	: 59, Radniyom Road, Tambon Noenphra, Amphoe Mueang Rayong, Rayong, Thailand
Branch 2 (Olefin 1 Branch)	: 14, I-1 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 3 (Olefin 2 Branch)	: 9, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 4 (Aromatics 1 Branch)	: 4, I-2 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 5 (Aromatics 2 Branch)	: 98/9, Rayong 3191 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 6 (Refining Branch)	: 8, I-8 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 7 (Jetty and Buffer Tank Farm Branch)	: 19, Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 8 (Aromatics reserve Branch)	: 11, I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Branch 9 (Lab Service Center Branch)	: 24/9, Pakorn Songkroa-Rat Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 10 (PTTGC 10 Branch)	: 555/1, Energy Complex, Building A, 1st, 3rd and 10th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok, Thailand
Branch 11 (Olefin 3 Branch)	: 8, Phadang Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 12 (Polyethylene Branch)	: 8, Map Ta Phut Industrial Estate, I-10 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong, Thailand
Branch 13 (Innoplus Solution Center Branch)	: 83/9-10, Moo 5, Tambon Tabma, Amphoe Mueang Rayong, Rayong, Thailand

The principal businesses of the Company are production and distribution of ethylene, propylene polyethylene and biochemical products. By-products are mixed C4, cracker bottom and tail gas, refining and provision of integrated petroleum products, and production and distribution of aromatics products with plans to proceed with the production of aromatic products. Minor activities are production and distribution of electricity, water, steam and other utilities. In addition, the Company also operates production support facilities such as jetty and buffer tank farm services for liquid chemical, oil and gas.

Details of the Company's subsidiaries as at 31 December 2018 and 2017 were as follows:

Name of the entity	Type of business	Country of incorporation	Ownership interest (%)	
			2018	2017
<b>Direct subsidiaries</b>				
Global Green Chemicals Plc.	Manufacturing and distributing biochemical products	Thailand	72.29	72.29
GC Glycol Co., Ltd. (Formerly TOC Glycol Co., Ltd.)	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Polyols Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	82.10	82.10
GC Marketing Solutions Co., Ltd. (Formerly PTT Polymer Marketing Co., Ltd.)	Development, marketing and distributing polymers products, byproducts and other polymers-related products	Thailand	100	100
GC Maintenance and Engineering Co., Ltd. (Formerly PTT Maintenance and Engineering Co., Ltd.)	Factory maintenance and engineering services	Thailand	100	100

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

Name of the entity	Type of business	Country of incorporation	Ownership interest (%)	
			2018	2017
<i>Direct subsidiaries (continue)</i>				
GC Logistic Solutions Co., Ltd. (Formerly PTT Polymer Logistics Co., Ltd.)	Transportation, warehouse and bagging packing management of polyethylene	Thailand	100	100
GC Ventures Co., Ltd.	Invest in form of Corporate Venture Capital (CVC)	Thailand	100	-
GC Treasury Center Co., Ltd.	Financial service management for the group	Thailand	100	100
GC Styrenics Co., Ltd. (Formerly Thai Styrenics Co., Ltd.)	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Oxirane Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
GC Estate Co., Ltd.	Real estate development for rent and to invest in petrochemical and related industries	Thailand	100	-
Solution Creation Co., Ltd.	Manufacturing and distributing petrochemical products and health and nutrition products	Thailand	100	100
Thai Tank Terminal Limited	Service for the storage and handling of liquid chemicals, oil and gas	Thailand	51	51
Bio Spectrum Co., Ltd. (In process of liquidation)	Manufacturing and distributing biochemical products	Thailand	100	100
PTT Phenol Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	100	100
Siam Mitsui PTA Co., Ltd. (49% Direct interest and 25% Indirect interest)	Manufacturing and distributing petrochemical products	Thailand	74	-
Auria BioChemicals Co., Ltd. (54% Direct interest and 46% Indirect interest) (In process of liquidation)	Research and development of bio-based chemicals	Thailand	100	100
NPC Safety and Environmental Service Co., Ltd.	Safety and environmental services	Thailand	100	100
PTTGC America Corporation	Holding and operating international business	United States of America	100	100
PTTGC International Private Limited (Formerly PTT Chemical International Pte. Ltd.)	Holding and operating international business	Singapore	100	100

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

Name of the entity	Type of business	Country of incorporation	Ownership interest (%)	
			2018	2017
<i>Indirect subsidiaries</i>				
GGC Biochemical Co., Ltd.	Holding and operating in Thailand	Thailand	100	-
Thai Fatty Alcohols Co., Ltd.	Manufacturing and distributing biochemical products	Thailand	72.29	72.29
Thai Pet Resin Co., Ltd.	Manufacturing and distributing petrochemical products	Thailand	74	-
PL Global Transport Co., Ltd.	Transportation of polyethylene	Thailand	100	100
NPC S&E Security Guard Co., Ltd.	Safety services	Thailand	100	100
GC Ventures America Corporation	Invest in form of Corporate Venture Capital (CVC) outside Thailand	United States of America	100	-
Polymer Marketing DMCC	Distributing polymer products and other polymers-related products	United Arab Emirates	100	100
Polymer Marketing Myanmar Company Ltd.	Distributing polymer products and other polymers-related products	Myanmar	100	-
Polymer Marketing Vietnam Company Ltd.	Distributing polymer products and other polymers-related products	Vietnam	100	100
PTTGC America LLC	Operating petrochemical business	United States of America	100	100
PTTGC Innovation America Corporation (Formerly Myriant Corporation)	Research and development of bio-based chemicals	United States of America	100	100
PTTGC International (Netherlands) B.V.	Holding and operating international business	Netherlands	100	100
PTTGC International (USA) Inc.	Holding and operating international business	United States of America	100	100
Vencorex Holding	Manufacturing and distributing chemical specialties	France	90.82	90.82

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 2 Basis of preparation of the financial statements

#### (a) *Statement of compliance*

The financial statements are prepared in accordance with Thai Financial Reporting Standards (TFRS); guidelines promulgated by the Federation of Accounting Professions (“FAP”); and applicable rules and regulations of the Thai Securities and Exchange Commission.

The FAP has issued new and revised TFRS effective for annual accounting periods beginning on or after 1 January 2018. The application of these new and revised TFRS has resulted in changes in certain of the Group’s accounting policies. These changes have no material effect on the financial statements.

In addition to the above new and revised TFRS, the FAP has issued a number of new and revised TFRS which are not yet effective for current periods. The Group has not early adopted these standards in preparing these financial statements. Those new and revised TFRS that are relevant to the Group’s operations are disclosed in note 39.

#### (b) *Basis of measurement*

The financial statements have been prepared on the historical cost basis, except as described in accounting policy.

#### (c) *Functional and presentation currency*

The financial statements are prepared and presented in Thai Baht which is the Company’s functional currency.

#### (d) *Use of judgements and estimates*

The preparation of financial statements in conformity with TFRS requires management to make judgements, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised prospectively.

Information about assumptions and estimation uncertainties is included in the following notes:

Note 4 and 38	Recognition and measurement of provisions and contingencies: key assumptions about the likelihood and magnitude of an outflow of resources.
Notes 5	Acquisition of subsidiary: fair value of the consideration transferred (including contingent consideration) and fair value of the assets acquired and liabilities assumed, measured on a provisional basis;
Notes 11, 12, 14, 15, 17 and 18	Impairment test: key assumptions underlying recoverable amounts
Note 23	Measurement of defined benefit obligations: key actuarial assumptions
Note 19	Recognition of deferred tax assets: availability of future taxable profit against which tax losses carried forward can be used;

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### *Measurement of fair values*

A number of the Group's accounting policies and disclosures require the measurement of fair values, for both financial assets and liabilities.

When measuring the fair value of an asset or a liability, the Group uses observable market data as far as possible. Fair values are categorised into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or liability might be categorised in different levels of the fair value hierarchy, then the fair value measurement is categorised in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

Further information about the assumptions made in measuring fair values is included in note 36: Financial instruments.

### **3 Significant accounting policies**

The accounting policies set out below have been applied consistently to all periods presented in these financial statements.

#### **(a) Basis of consolidation**

The consolidated financial statements relate to the Company and its subsidiaries (together referred to as the "Group") and the Group's interests in joint ventures and associates.

#### *Business combinations*

The Group applies the acquisition method for all business combinations when control is transferred to the Group, as describe in subsidiaries section, other than those with entities under common control.

The Group recognises goodwill at the acquisition date measured as the excess of (1) over (2) as:

- (1) The aggregate of:
  - the fair value of the consideration transferred;
  - the recognised amount of any non-controlling interests in the acquiree; and
  - if the business combination is achieved in stages, the fair value of the existing equity interest in the acquiree.
- (2) The net fair value of the identifiable assets acquired and liabilities assumed.

If value of (1) is less than (2), difference is contributed to gain on bargain purchase and recognised immediately in profit or loss.

The consideration transferred is recognised at fair value at the acquisition date.



# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

### **For the year ended 31 December 2018**

Transaction costs that the Group incurs in connection with a business combination, such as legal fees, and other professional and consulting fees are expensed as incurred.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs, the Group reports provisional amounts for the items for which the accounting is incomplete. Those provisional amounts are adjusted during the measurement period, or additional assets or liabilities are recognized, to reflect new information obtained about facts and circumstances that existed at the acquisition date that, if known, would have affected the amounts recognized at that date.

#### *Acquisitions from entities under common control*

Business combination under common control are accounted for using a method similar to the pooling of interest method. Under that method the acquirer recognizes assets and liabilities of the acquired businesses at their carrying amounts in the consolidated financial statements of the ultimate parent company at the moment of the transaction. The difference between the carrying amount of the acquired net assets and the consideration transferred is recognized as surplus or discount from business combinations under common control in shareholder's equity. The surplus or discount will be transferred to retained earnings upon divestment of the businesses acquired.

The results from operations of the acquired businesses will be included in the consolidated financial statements of the acquirer from the beginning of the comparative period or the moment the businesses came under common control, whichever date is later, until control ceases.

#### *Subsidiaries*

Subsidiaries are entities controlled by the Group. The Group controls an entity when it has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

#### *Non-controlling interests*

At the acquisition date, the Group measures any non-controlling interest at its proportionate interest in the identifiable net assets of the acquiree.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

#### *Loss of control*

When the Group loses control over a subsidiary, it derecognises the assets and liabilities of the subsidiary, and any related non-controlling interests and other components of equity. Any resulting gain or loss is recognised in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

#### *Interests in equity-accounted investees*

The Group's interests in equity-accounted investees comprise interests in joint ventures and associates.

A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than the rights to its assets and obligations for its liabilities. Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Interests in joint ventures and associates are accounted for using the equity method. They are recognised initially at cost. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the profit or loss and other comprehensive income of equity-accounted investees, until the date on which joint control or significant influence ceases.

### *Transactions eliminated on consolidation*

Intra-group balances and transactions and any unrealised income or expenses arising from intra-group transactions are eliminated in preparing the consolidated financial statements. Unrealised gains and losses arising from transactions with joint ventures and associates are eliminated against the investment to the extent of the Group's interest in the investee.

### **(b) Foreign currencies**

#### *Foreign currency transactions*

Transactions in foreign currencies are translated to the respective functional currency of Group entities at exchange rate at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated to the functional currency at the exchange rate at the reporting date.

Non-monetary assets and liabilities measured at cost in foreign currencies are translated to the functional currency at the exchange rates at the dates of the transactions.

Foreign currency differences arising on retranslation are generally recognised in profit or loss. However, foreign currency differences arising from the translation of qualifying cash flow hedges to the extent that the hedges are effective are recognised in other comprehensive income.

#### *Foreign operations*

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition of foreign operations, are translated to Thai Baht at the exchange rates at the reporting date.

The revenues and expenses of foreign operations are translated to Thai Baht at rates approximating the exchange rates at the dates of the transactions.

Foreign exchange differences are recognised in other comprehensive income and presented in the foreign currency translation reserve in equity until disposal of the investment, except to extent that the translation difference is allocated to non-controlling interest.

### **(c) Derivatives**

Derivatives are used to manage exposure to foreign exchange, interest rate arising from operating and financing activities. Derivatives are not used for trading purposes. However, derivatives that do not qualify for hedging instruments are accounted for as trading instruments.

Derivatives are recognised initially at fair value; attributable transaction costs are recognised in profit or loss when incurred. Subsequent to initial recognition, they are remeasured at fair value. The gain or loss on remeasurement is recognised immediately in profit or loss.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

The fair value of interest rate swaps is based on broker quotes at the reporting date. Those quotes are tested for reasonableness by discounting estimated future cash flows based on the terms and maturity of each contract and using market interest rates for a similar instrument at the reporting date.

The fair value of forward exchange contracts is based on their listed market price as the reporting date, if available. If a listed market price is not available, then fair value is estimated by forward contract with the same nature and maturity date at the reporting date.

### (d) *Hedge accounting*

#### *Cash flow hedges accounting of the non-financial assets or non-financial liabilities*

When a derivative is designated as the hedging instrument in a hedge of the variability in cash flows of a non-financial asset or non-financial liability, the effective portion of gain or loss from subsequent measurement of fair value of the derivative is recognised in other comprehensive income and presented in the hedging reserve in equity. Any ineffective portion is recognised immediately in profit or loss.

When a hedge of a non-financial asset or non-financial liability occurs, the gain or loss recognised in other comprehensive income is included in the cost of the non-financial asset or non-financial liability.

#### *Discontinuing hedge accounting*

When the hedging instrument expires or is sold, terminated, or no longer qualifies for hedge accounting, the hedge accounting is discontinued prospectively. Any cumulative gain or loss on the hedging instrument existing in equity is retained in equity. When the hedge of the non-financial assets or non-financial liabilities item ultimately occurs, the gain or loss is adjusted according to cash flow hedges accounting.

When the non-financial assets or non-financial liabilities item is no longer expected to occur, the cumulative gain or loss that was reported in equity is recognised in profit or loss immediately.

### (e) *Cash and cash equivalents*

Cash and cash equivalents comprise cash balances, call deposits and highly liquid current investments.

### (f) *Trade and other receivables*

Trade and other receivables are stated at their invoice value less allowance for doubtful accounts.

The allowance for doubtful accounts is assessed primarily on analysis of overdue aging and future expectations of customer payments. Bad debts are written off when incurred.

### (g) *Inventories*

Inventories are stated at the lower of cost and net realisable value.

Cost is calculated using the weighted average cost principle, and comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. In the case of manufactured inventories and work-in-progress, cost includes an appropriate share of production overheads based on normal operating capacity.

Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs to complete and to make the sale.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### (h) *Investments*

#### *Investments in subsidiaries, joint ventures and associates*

Investments in subsidiaries, joint ventures and associates in the separate financial statements of the Company are accounted for using the cost method. Investments in joint ventures and associates in the consolidated financial statements are accounted for using the equity method.

#### *Investments in other debt securities and equity securities*

Debt securities that the Group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are stated at amortised cost, less any impairment losses. The difference between the acquisition cost and redemption value of such debt securities is amortised using the effective interest rate method over the period to maturity.

Debt securities and marketable equity securities, other than those securities held for trading or intended to be held to maturity, are classified as available-for-sale investments. Available-for-sale investments are, subsequent to initial recognition, stated at fair value, and changes therein, other than impairment losses and foreign currency differences on available-for-sale monetary items, are recognised directly in equity. Impairment losses and foreign exchange differences are recognised in profit or loss. When these investments are derecognised, the cumulative gain or loss previously recognised directly in equity is recognised in profit or loss. Where these investments are interest-bearing, interest calculated using the effective interest method is recognised in profit or loss.

Equity securities which are not marketable are stated at cost less any impairment losses.

The fair value of financial instruments classified as available-for-sale is determined as the quoted bid price at the reporting date.

#### *Disposal of investments*

On disposal of an investment, the difference between net disposal proceeds and the carrying amount together with the associated cumulative gain or loss that was reported in equity is recognised in profit or loss.

If the Group disposes of part of its holding of a particular investment, the deemed cost of the part sold is determined using the weighted average method applied to the carrying value of the total holding of the investment.

### (i) *Investment properties*

Investment properties are properties which are held to earn rental income, for capital appreciation or for both, but not for sale in the ordinary course of business, use in the production or supply of goods or services or for administrative purposes.

Investment properties are measured at cost less accumulated depreciation and impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the investment property. The cost of self-constructed investment property includes the cost of materials and direct labour, and other costs directly attributable to bringing the investment property to a working condition for its intended use and capitalised borrowing costs.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Depreciation is charged to profit or loss on a straight-line basis over the estimated useful lives of each property. The estimated useful lives are as follows:

Investment property	20 years
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### (j) *Property, plant and equipment*

#### *Recognition and measurement*

##### *Owned assets*

Property, plant and equipment are measured at cost less accumulated depreciation and impairment losses.

Cost includes expenditure that is directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials and direct labour, any other costs directly attributable to bringing the assets to a working condition for their intended use, the costs of dismantling and removing the items and restoring the site on which they are located, and capitalised borrowing costs. Cost also may include transfers from other comprehensive income of any gain or loss on qualifying cash flow hedges of foreign currency purchases of property, plant and equipment. Purchased software that is integral to the functionality of the related equipment is capitalised as part of that equipment.

When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Any gains and losses on disposal of an item of property, plant and equipment are determined by comparing the proceeds from disposal with the carrying amount of property, plant and equipment, and are recognised in profit or loss.

##### *Leased assets*

Leases in terms of which the Group substantially assumes all the risk and rewards of ownership are classified as finance leases. Property, plant and equipment acquired by way of finance leases are capitalised at the lower of their fair value and the present value of the minimum lease payments at the inception of the lease, less accumulated depreciation and impairment losses. Lease payments are apportioned between the finance charges and reduction of the lease liability so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are charged directly to the profit or loss.

##### *Subsequent costs*

The cost of replacing a part of an item of property, plant and equipment is recognised in the carrying amount of the item if it is probable that the future economic benefits embodied within the part will flow to the Group, and its cost can be measured reliably. The carrying amount of the replaced part is derecognised. The costs of the day-to-day servicing of property, plant and equipment are recognised in profit or loss as incurred.

##### *Depreciation*

Depreciation is calculated based on the depreciable amount, which is the cost of an asset, or other amount substituted for cost, less its residual value.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Depreciation is charged to profit or loss on a straight-line basis over the estimated useful lives of each component of an item of property, plant and equipment. The estimated useful lives are as follows:

Land improvement	5-30 years
Plant, machinery, equipment and factory tools	5-40 years
Buildings and buildings improvement	5-30 years
Furniture, fixtures and office equipment	3-10 years
Vehicles	5-25 years

No depreciation is provided on freehold land or assets under construction.

Depreciation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

### (k) *Intangible assets*

#### *Goodwill*

Goodwill that arises upon the acquisition of businesses is included in intangible assets. Subsequent to initial recognition, goodwill is measured at cost less accumulated impairment losses.

Goodwill in investment in joint ventures and associates is included in the carrying amount of the investment in joint ventures and associates, impairment loss on such an investment is deducted directly in investment in joint ventures and associates.

#### *Other intangible assets*

Other intangible assets that are acquired by the Group and have finite useful lives are measured at cost less accumulated amortisation and accumulated impairment losses.

#### *Subsequent expenditure*

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill and brands, are recognised in profit or loss as incurred.

#### *Amortisation*

Amortisation is based on the cost of the asset, or other amount substituted for cost, less its residual value.

Amortisation is recognised in profit or loss on a straight-line basis over the estimated useful lives of intangible assets, other than goodwill and trademark, from the date that they are available for use, since this most closely reflects the expected pattern of consumption of the future economic benefits embodied in the asset. The estimated useful lives for the current and comparative periods are as follows:

Production licence fees	10-30 years
Computer software	3-10 years
Customer contracts and the related customer relationships	5 years
Right to use pipe rack	6-15 years
Right to use - others	3-16 years

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

Amortisation methods, useful lives and residual values are reviewed at each financial year-end and adjusted if appropriate.

#### **(l) Impairment**

The carrying amounts of the Group's assets are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, the assets' recoverable amounts are estimated. For goodwill and intangible assets that have indefinite useful lives or are not yet available for use, the recoverable amount is estimated each year at the same time.

An impairment loss is recognised if the carrying amount of an asset or its cash-generating unit exceeds its recoverable amount. The impairment loss is recognised in profit or loss.

When a decline in the fair value of an available-for-sale financial asset has been recognised directly in equity and there is objective evidence that the value of the asset is impaired, the cumulative loss that had been recognised directly in equity is recognised in profit or loss even though the financial asset has not been derecognised. The amount of the cumulative loss that is recognised in profit or loss is the difference between the acquisition cost and current fair value, less any impairment loss on that financial asset previously recognised in profit or loss.

#### *Calculation of recoverable amount*

The recoverable amount of held-to-maturity securities carried at amortised cost is calculated as the present value of the estimated future cash flows discounted at the original effective interest rate.

The recoverable amount of available-for-sale financial assets is calculated by reference to the fair value.

The recoverable amount of a non-financial asset is the greater of the asset's value in use and fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. For an asset that does not generate cash inflows largely independent of those from other assets, the recoverable amount is determined for the cash-generating unit to which the asset belongs.

#### *Reversals of impairment*

An impairment loss in respect of a financial asset is reversed if the subsequent increase in recoverable amount can be related objectively to an event occurring after the impairment loss was recognised in profit or loss.

An impairment loss in respect of goodwill is not reversed.

Impairment losses recognised in prior periods in respect of other non-financial assets are assessed at each reporting date for any indications that the loss has decreased or no longer exists. An impairment loss is reversed if there has been a change in the estimates used to determine the recoverable amount. An impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortisation, if no impairment loss had been recognised.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

**(m) Interest-bearing liabilities**

Interest-bearing liabilities are recognised initially at fair value less attributable transaction charges. Subsequent to initial recognition, interest-bearing liabilities are stated at amortised cost with any difference between cost and redemption value being recognised in profit or loss over the period of the borrowings on an effective interest basis.

**(n) Trade and other payables**

Trade and other payables are stated at cost.

**(o) Employee benefits**

*Defined contribution plans*

Obligations for contributions to defined contribution plans are expensed as the related service is provided.

*Defined benefit plans*

The Group's net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods, discounting that amount.

The calculation of defined benefit obligations is performed every 3 years by a qualified actuary using the projected unit credit method.

Remeasurements of the net defined benefit liability, actuarial gain or loss are recognised immediately in OCI. The Group determines the interest expense on the net defined benefit liability for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period. Net interest expense and other expenses related to defined benefit plans are recognised in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognised immediately in profit or loss. The Group recognises gains and losses on the settlement of a defined benefit plan when the settlement occurs.

*Other long-term employee benefits*

The Group's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognised in profit or loss in the period in which they arise.

*Termination benefits*

Termination benefits are expensed at the earlier of when the Group can no longer withdraw the offer of those benefits and when the Group recognises costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the end of the reporting period, then they are discounted.



# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### *Short-term employee benefits*

Short-term employee benefits are expensed as the related service is provided. A liability is recognised for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

### **(p) Provisions**

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount on provisions is recognised as finance cost.

### **(q) Revenue**

Revenue excludes value added taxes and is arrived at after deduction of trade discounts.

#### *Sale of goods and services rendered*

Revenue is recognised in profit or loss when the significant risks and rewards of ownership have been transferred to the buyer. No revenue is recognised if there is continuing management involvement with the goods or there are significant uncertainties regarding recovery of the consideration due, associated costs or the probable return of goods. Service income is recognised as services are provided.

#### *Rental income*

Rental income from investment property is recognised in profit or loss on a straight-line basis over the term of the lease. Lease incentives granted are recognised as an integral part of the total rental income. Contingent rentals are recognised as income in the accounting period in which they are earned.

#### *Investments*

Revenue from investments comprises dividend and interest income from investments and bank deposits.

#### *Dividend income*

Dividend income is recognised in profit or loss on the date the Group's right to receive payments is established.

#### *Interest income*

Interest income is recognised in profit or loss as it accrues.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### (r) *Finance costs*

Finance costs is recognised using the effective interest method and comprise interest expense on borrowings, unwinding of the discount on provisions and contingent consideration, fair value losses on financial assets at fair value through profit or loss, impairment losses recognised on financial assets (other than trade receivables), and losses on hedging instruments that are recognised in profit or loss.

Borrowing costs that are not directly attributable to the acquisition, construction or production of a qualifying asset are recognised in profit or loss using the effective interest method.

### (s) *Lease payments*

Payments made under operating leases are recognised in profit or loss on a straight line basis over the term of the lease.

Contingent lease payments which the lease adjustment is confirmed are accounted for by revising the minimum lease payments over the remaining term of the lease.

### (t) *Income tax*

Income tax expense for the year comprises current and deferred tax. Current and deferred tax are recognised in profit or loss except to the extent that they are relate to the items recognised in equity are recognised in equity are recognised in other comprehensive income.

Current tax is the expected tax payable or receivable on the taxable income for the year, using tax rates enacted at the end of the reporting period, and any adjustment to tax payable or receivable in respect of previous years.

Deferred tax is recognised in respect of temporary differences between the carrying amounts and taxable value of assets and liabilities, using tax rates enacted or substantively enacted to the temporary differences when they reverse.

Deferred tax is not recognised for the following temporary differences:

- the initial recognition of goodwill and related transactions
- the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss
- differences relating to investments in subsidiaries to the extent that it is probable that they will not reverse in the foreseeable future.

The measurement of deferred tax reflects the tax consequences that would follow the manner in which the Group expects, at the end of the reporting period, to recover or settle the carrying amount of its assets and liabilities.

In determining the amount of current and deferred tax, the Group takes into account the impact of uncertain tax positions and whether additional taxes and interest may be due. The Group believes that its accruals for tax liabilities are adequate for all open tax years based on its assessment of many factors, including interpretations of tax law and prior experience. This assessment relies on estimates and assumptions and may involve a series of judgements about future events. New information may become available that causes the Group to change its judgement regarding the adequacy of existing tax liabilities; such changes to tax liabilities will impact tax expense in the period that such a determination is made.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Deferred tax assets and liabilities on different tax entities are offset if there is a legally enforceable right to offset current tax assets and liabilities, and they relate to income taxes levied by the same tax authority.

A deferred tax asset is recognised to the extent that it is probable that deferred tax assets can be utilised as future tax benefit. Deferred tax assets are reviewed at each reporting date and reduced to the extent that it is no longer probable that the related tax benefit will be realised.

### (u) *Earnings per share*

The Group presents basic earnings per share (EPS) data for its ordinary shares. Basic EPS is calculated by dividing the profit or loss attributable to ordinary shareholders of the Company by the weighted average number of ordinary shares outstanding during the year, adjusted for treasury shares.

### (v) *Segment reporting*

Segment results that are reported to the Group's Management Committee (the chief operating decision maker) include items directly attributable to a segment as well as those that can be allocated on a reasonable basis.

## 4 Expenses from raw materials derogation

As raw material used in production process are volatile commodities, the subsidiary has policy to manage inventory to be at an appropriate level in order to mitigate impact from the raw material price volatility. During second quarter of 2018, a subsidiary has found that the quantity of raw materials in the system was higher than actual quantity at the storage facilities of the suppliers. In addition, this also includes the case that the subsidiary delivered the raw materials to the supplier for refining, however, the supplier neither returned back the refining products according to the contract nor the raw materials to the subsidiary. In October and December 2017, the subsidiary performed raw material inventory physical checking and the result of inspection was in line with what was recorded in the system.

During June 2018, the subsidiary conducted an in-depth investigation and found the misconduct among certain suppliers and some employees in the relevant functions of the subsidiary, in which certain suppliers are related. The subsidiary take legal action against the parties involved and conducted a disciplinary investigation against involved employees. On 17 July 2018, the subsidiary had already taken legal actions against involved parties (external and internal). Also, the subsidiary is in the process of conducting the disciplinary investigation against every involved employees.

In consequence, the Group has recognised expenses from raw materials derogation in the consolidated statements of income for the year ended 31 December 2018 amounting to Baht 2,004 million (owners of the parent net of tax amounting to Baht 1,261 million). However, the subsidiary is legally entitled to claim from those involved.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

### **For the year ended 31 December 2018**

In addition, the subsidiary was informed from the third party who received the transfer of claim from the supplier for the payment of raw materials, which the supplier borrowed from the third party to purchase raw materials to sell to the subsidiary and the subsidiary had to pay for the raw materials to that third party under the transfer of right for the payment of raw materials. After reviewing the documents provided, the subsidiary informed to third party that these documents are not in the system, nor there was no evidence regarding the delivery of raw materials as prescribed in the documents. Subsequently on 20 August 2018, that third party filed a civil lawsuit against the supplier and the subsidiary as joint defendants for violation of loan agreement and transfer of claim (as disclosed in note 38), with damage claimed amounting to Baht 308.75 million with interest rate at 15% per annum amounting to Baht 15.90 million, totalling Baht 324.65 million. The legal advisor of the subsidiary provided the opinion that if it can be proven that the delivery of the materials had not been made to the subsidiary, the subsidiary should not have any obligation to pay for such payments. The Court specified the day of determination of dispute issue and the legal process or plaintiff's witness hearing on 26 November 2018, which the parties announced to the court that they could not negotiate a settlement, therefore, the court determined the dispute issues and scheduled the trial hearing of the plaintiff and defendant's witnesses in July 2019.

On 31 January 2019, the subsidiary has reached the agreements with some of the suppliers to compensate for the raw materials derogation issue by entering into settlement agreements which requires suppliers to deliver the pending quantity of raw material under the period specified in the agreements.

## **5 Acquisition of businesses**

On 8 August 2018, the Group entered into the Shares Purchase Agreement to acquire 74% share of Siam Mitsui PTA Company Limited, Purified Terephthalic Acid producer, and 74% share of Thai PET Resin Company Limited, Polyethylene Terephthalate resin producer, directly and indirectly, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. Subsequently on 27 December 2018, the Group completed the share acquisition of subsidiaries for a preliminary cash consideration of approximately Baht 4,123 million. The final purchase price was settled with the seller for an additional payment of approximately Baht 1,249 million, which will be paid in March 2019.

Management believes that the acquisition is harmonized with the business strategy of the Company that intends to expand the downstream investment and increase market potential in polymer business to satisfy customer's need.

The purchase under this condition is in accordance with TFRS 3 Business Combinations, requires the recognition of assets, liabilities and contingent liabilities acquired at the acquisition date at fair value. The Group is in process of hiring an independent appraiser to determine the fair value of assets and liabilities acquired during the measurement period, which must not exceed one year from the acquisition date to reflect new information obtained about facts and circumstances that existed as of the acquisition date. Accordingly, the fair value of assets acquired and liabilities assumed have been provisionally determined at the acquisition date (the value of property, plant and equipment determined by independent assets appraiser). However, the fair value of assets acquired and liabilities assumed has not yet completed. Upon the completion of the fair value determined by independent appraisers, the fair value of the assets acquired and liabilities assumed will be adjusted accordingly.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

The following summarises the major classes of consideration transferred, and the recognised amounts of assets acquired and liabilities assumed at the acquisition date:

#### *Identifiable assets acquired and liabilities assumed*

	<i>Note</i>	<b>Fair values</b> <i>(in million Baht)</i>
Cash and cash equivalents		1,589
Trade accounts receivable		2,481
Inventories		2,201
Property, plant and equipment	15	9,549
Intangible assets	18	8
Trade accounts payable		(2,777)
Other payables		(183)
Long-term loans from financial institutions		(750)
Deferred tax	19	(584)
Other assets/(liabilities), net		(2,444)
<b>Net identifiable assets acquired and liabilities assumed</b>		<b>9,090</b>
Non-controlling interest acquired		(2,363)
<b>Net assets acquired and liabilities assumed</b>		<b>6,727</b>
Gain on bargain purchase		(1,355)
<b>Total consideration</b>		<b>5,372</b>
Cash acquired		(1,589)
<b>Net consideration</b>		<b>3,783</b>

#### *Acquisition-related costs*

The Group incurred acquisition-related costs of Baht 110 million related to external legal fees and due diligence costs. The legal fees and due diligence costs have been included in administrative expenses in the Group's consolidated statement of income in the period which transaction occurred.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 6 Related parties

A related party is as follows;

- An individual or an entity which has the ability, directly or indirectly, to control or joint control or exercise significant influence over the Group in making financial and operating decisions or;
- An individual or an entity which is subject to common control or common significant influence with the Group or;
- The Group has the ability, directly or indirectly, to control or joint control or exercise significant influence over an individual or an entity in making financial and operating decisions.

Relationships with related parties were as follows:

Name of entities	Country of incorporation / nationality	Nature of relationships
PTT Plc.	Thailand	Parent, some common directors and management and the Company's director as a management
Global Green Chemicals Plc.	Thailand	Subsidiary, 72.29% shareholding, some common directors and the Company's management as a director
GC Glycol Co., Ltd. (Formerly TOC Glycol Co., Ltd.)	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Polyols Co., Ltd.	Thailand	Subsidiary, 82.10% shareholding and the Company's management as a director
GC Maintenance and Engineering Co., Ltd. (Formerly PTT Maintenance and engineering Co., Ltd.)	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Marketing Solutions Co., Ltd. (Formerly PTT Polymer Marketing Co., Ltd.)	Thailand	Subsidiary, 100% shareholding by the Group, and the Company's management as a director
GC Logistics Solutions Co., Ltd. (Formerly PTT Polymer Logistics Co., Ltd.)	Thailand	Subsidiary, 100% shareholding by the Group
GC Ventures Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Treasury Center Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Styrenics Co., Ltd. (Formerly Thai Styrenics Co., Ltd.)	Thailand	Subsidiary, 100% shareholding and the Company's management as a director

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Name of entities	Country of incorporation / nationality	Nature of relationships
GC Estate Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
GC Oxirane Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Solution Creation Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Thai Tank Terminal Limited	Thailand	Subsidiary, 51% shareholding and the Company's management as a director
Bio Spectrum Co., Ltd. (In process of liquidation)	Thailand	Subsidiary, 100% shareholding
PTT Phenol Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Siam Mitsui PTA Co., Ltd.	Thailand	Subsidiary, 49% shareholding by the Company and 25% shareholding by subsidiary and the Company's management as a director
NPC Safety and Environmental Service Co., Ltd.	Thailand	Subsidiary, 100% shareholding and the Company's management as a director
Auria BioChemicals Co., Ltd. (In process of liquidation)	Thailand	Subsidiary, 100% shareholding by the Group
PTTGC America Corporation	United States of America	Subsidiary, 100% shareholding, some common management and the Company's management as a director
PTTGC International Private Limited (Formerly PTT Chemical International Private Limited)	Singapore	Subsidiary, 100% shareholding, some common directors and management and the Company's management as a director
GGC Biochemicals Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group
Thai PET Resin Co., Ltd.	Thailand	Indirect subsidiary, 84.4% shareholding by subsidiaries and the Company's management as a director
Thai Fatty Alcohols Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group
PL Global Transport Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Name of entities	Country of incorporation / nationality	Nature of relationships
NPC S&E Security Guard Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group
Vencorex (Thailand) Co., Ltd.	Thailand	Indirect subsidiary, 100% shareholding by the Group
GC Ventures America Corporation	United States of America	Indirect subsidiary, 100% shareholding by the Group, and the Company's management as a director
Polymer Marketing DMCC	United Arab Emirates	Indirect subsidiary, 100% shareholding by the Group
Polymer Marketing Myanmar Company Limited	Myanmar	Indirect subsidiary, 100% shareholding by the Group
Polymer Marketing Vietnam Company Limited	Vietnam	Indirect subsidiary, 100% shareholding by the Group
PTTGC America LLC	United States of America	Indirect subsidiary, 100% shareholding by the Group, some common management and the Company's management as a director
PTTGC Innovation America Corporation (Formerly Myriant Corporation)	United States of America	Indirect subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director
PTTGC International (Netherlands) B.V.	Netherlands	Indirect subsidiary, 100% shareholding by the Group, some common directors and the Company's management as a director
PTTGC International (USA) Inc.	United States of America	Indirect subsidiary, 100% shareholding by the Group, some common directors and management, the Company's director as a management and the Company's management as a director
Vencorex France S.A.S.	France	Indirect subsidiary, 100% shareholding by the Group
Vencorex Holding	France	Indirect subsidiary, 90.82% shareholding by the Group, some common directors and the Company's management as a director
PTT Asahi Chemical Co., Ltd.	Thailand	Joint venture, 50% shareholding and the Company's management as a director
PTT MCC Biochem Co., Ltd.	Thailand	Joint venture, 50% shareholding



# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Name of entities	Country of incorporation / nationality	Nature of relationships
HMC Polymers Co., Ltd.	Thailand	Joint venture, 41.44% shareholding and the Company's management as a director
Thai Ethoxylate Co., Ltd.	Thailand	Indirect joint venture, 50% shareholding by the Group
NatureWorks Asia Pacific Co., Ltd.	Thailand	Indirect joint venture, 50% shareholding by the Group
Emery Oleochemicals (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group, some common directors and the Company's management as a director
Emery Oleochemicals Marketing (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group
Emery Specialty Chemicals Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group, some common directors and the Company's management as a director
Emeryoleo Specialties (M) Sdn. Bhd.	Malaysia	Indirect joint venture, 50% shareholding by the Group
NatureWorks LLC	United States of America	Indirect joint venture, 50% shareholding by the Group, some common directors and the Company's management as a director
Global Power Synergy Plc.	Thailand	Associate, 23% shareholding, shareholding by parent company, some common directors and the Company's management as a director
Kuraray GC Advanced Materials Company Limited	Thailand	Associate, 33.40% shareholding
PTT Energy Solutions Co., Ltd.	Thailand	Associate, 20% shareholding, shareholding by parent company and the Company's management as a director
PTT Digital Solutions Co., Ltd.	Thailand	Associate, 40% shareholding, shareholding by parent company, some common directors and the Company's management as a director
Vinythai Plc.	Thailand	Associate, 25% shareholding and the Company's management as a director
Eastern Fluid Transport Co., Ltd.	Thailand	Associate, 15% shareholding by the Company and 15% shareholding by subsidiary
Thai Eastern Topseeds Oil Co., Ltd.	Thailand	Indirect associate, 30% shareholding by the Group

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Name of entities	Country of incorporation / nationality	Nature of relationships
S.P. Petpack Inter Group Co., Ltd.	Thailand	Indirect associate, 25% shareholding by the Group
PT. Indo Thai Trading	Indonesia	Indirect associate, 49% shareholding by the Group
Advanced Biochemical (Thailand) Co., Ltd.	Thailand	Related party, shareholding by associate
Thai Petroleum Pipeline Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Dhipaya Insurance Plc.	Thailand	Related party, shareholding by parent company
Thai Paraxylene Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Thai Oil Plc.	Thailand	Related party, shareholding by parent company
TOP Solvent Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
TOP Solvent (Vietnam) LLC.	Vietnam	Related party, indirect shareholding by parent company
Business Services Alliance Co., Ltd.	Thailand	Related party, shareholding by parent company, the Company and two Company's associates, each of 25% shareholding of preferred stock
PTT Natural Gas Distribution Co., Ltd.	Thailand	Related party, shareholding by parent company
PTT Retail Services Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
PTT Retail Management Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
PTT Oil and Retail Business Plc.	Thailand	Related party, shareholding by parent company
PTTEP Siam Limited	Thailand	Related party, indirect shareholding by parent company
PTTEP International Limited	Thailand	Related party, indirect shareholding by parent company
PTT Exploration and Production Plc.	Thailand	Related party, shareholding by parent company
Combined Heat and Power Producing Co., Ltd.	Thailand	Related party, indirect shareholding by parent company

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Name of entities	Country of incorporation / nationality	Nature of relationships
PTT Tank Terminal Limited	Thailand	Related party, shareholding by parent company
PTT Energy Resources Co., Ltd.	Thailand	Related party, shareholding by parent company
PTT LNG Co., Ltd.	Thailand	Related party, shareholding by parent company
Rak Phasak Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
LABIX Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Sak Chaisidhi Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Sport Services Alliance Co., Ltd.	Thailand	Related party, indirect shareholding by parent company and the Company's management as a director
Community Partnership Association	Thailand	The Company's management as a director
Amata Natural Gas Distribution Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Energy Complex Co., Ltd.	Thailand	Related party, shareholding by parent company
UBE Chemicals (Asia) Plc.	Thailand	Related party, indirect shareholding by parent company
IRPC Plc.	Thailand	Related party, shareholding by parent company
IRPC Polyol Co., Ltd.	Thailand	Related party, indirect shareholding by parent company
Carigali-PTTEPI Operating Company Sdn. Bhd.	Malaysia	Related party, indirect shareholding by parent company
PTT International Trading DMCC	United Arab Emirates	Related party, indirect shareholding by parent company
PTT International Trading London Ltd.	England	Related party, shareholding by parent company and some common directors
PTT International Trading Pte. Ltd.	Singapore	Related party, shareholding by parent company

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

The pricing policies for particular types of transactions are explained further below:

<b>Transactions</b>	<b>Pricing policies</b>
Sale of goods	Contract price / Regional market price / World market price
Rendering of services	Contract price
Purchase of goods / raw materials / services	Contract price / Market price
Interest on loan	Average cost of fund / Contractually agreed rate

Significant transactions for the year ended 31 December 2018 and 2017 with related parties were as follows:

	<b>Consolidated</b>		<b>Separate</b>	
	<b>financial statements</b>	<b>financial statements</b>	<b>financial statements</b>	<b>financial statements</b>
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Parent</b>				
Sales of goods or rendering of services	124,542	148,614	121,869	142,927
Purchases of goods or receiving of services	310,191	244,807	307,987	244,075
Other income	76	40	26	24
Other expense	115	88	85	64
Purchases of assets	6,944	-	-	-
<b>Subsidiaries</b>				
Sales of goods or rendering of services	-	-	107,775	95,027
Purchases of goods or receiving of services	-	-	3,364	3,203
Interest income	-	-	16	22
Dividend income	-	-	2,912	3,160
Other income	-	-	1,263	805
Interest expense	-	-	427	26
Other expense	-	-	2,146	2,131
<b>Joint ventures</b>				
Sales of goods or rendering of services	9,199	9,691	4,839	5,342
Purchases of goods or receiving of services	4,042	4,437	297	236
Interest income	242	134	240	132
Dividend income	-	-	1,242	1,781
Other income	70	34	63	27
Other expense	2	10	2	10
<b>Associates</b>				
Sales of goods or rendering of services	9,684	9,591	5,720	6,195
Purchases of goods or receiving of services	9,635	8,642	4,783	4,207
Dividend income	2	2	730	561
Other income	69	81	68	81
Other expense	462	460	342	325

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Other related parties</b>				
Sales of goods or rendering of services	127,249	46,338	122,271	43,559
Purchases of goods or receiving of services	22,608	16,060	21,074	15,094
Other income	182	229	175	213
Other expense	431	374	320	306
<b>Key management personnel</b>				
Key management personnel compensation				
Short-term benefits	369	357	192	208
Post-employment benefits and other long-term benefits	5	6	4	4
<b>Total key management personnel compensation</b>	<b>374</b>	<b>363</b>	<b>196</b>	<b>212</b>

Balances as at 31 December with related parties were as follows:

***Trade accounts receivable - related parties***

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Parent	3,576	12,625	3,554	12,215
Subsidiaries	-	-	9,520	8,475
Joint ventures	1,192	1,193	556	458
Associates	716	979	404	668
Other related parties	12,117	4,979	11,674	4,720
Total	17,601	19,776	25,708	26,536
Less allowance for doubtful accounts	-	-	-	-
<b>Net</b>	<b>17,601</b>	<b>19,776</b>	<b>25,708</b>	<b>26,536</b>
Bad and doubtful debts expense for the year	-	-	-	-

***Other receivables - related parties***

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Parent	49	210	42	207
Subsidiaries	-	-	441	599
Joint ventures	52	40	43	32
Associates	284	95	125	31
Other related parties	920	670	780	578
Total	1,305	1,015	1,431	1,447
Less allowance for doubtful accounts	-	-	-	-
<b>Net</b>	<b>1,305</b>	<b>1,015</b>	<b>1,431</b>	<b>1,447</b>
Bad and doubtful debts expense for the year	-	-	-	-

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### Loans to related parties

	Interest rate		Consolidated		Separate	
	2018	2017	financial statements	financial statements	financial statements	financial statements
	(% per annum)		2018	2017	2018	2017
<i>Short-term loans</i>						
Subsidiaries	1.89 - 3.52	1.87 - 4.42	-	-	607	476
Joint ventures	LIBOR plus margin	-	242	-	242	-
Total			242	-	849	476
Less allowance for doubtful accounts			-	-	-	-
<b>Net</b>			<b>242</b>	<b>-</b>	<b>849</b>	<b>476</b>
<i>Long-term loans</i>						
Joint venture	LIBOR plus margin	LIBOR plus margin	3,551	6,665	3,551	6,665
Total			3,551	6,665	3,551	6,665
Less allowance for doubtful accounts			-	-	-	-
<b>Net</b>			<b>3,551</b>	<b>6,665</b>	<b>3,551</b>	<b>6,665</b>
<i>Summary of loans to related parties</i>						
Short-term loans			242	-	849	476
Long-term loans			3,551	6,665	3,551	6,665
Total			3,793	6,665	4,400	7,141
Less allowance for doubtful accounts			-	-	-	-
<b>Net</b>			<b>3,793</b>	<b>6,665</b>	<b>4,400</b>	<b>7,141</b>
Bad and doubtful debts expense for the year			-	-	-	-

Movements during the years ended 31 December 2018 and 2017 of loans to related parties were as follows:

### Loans to related parties

	Consolidated		Separate	
	financial statements	financial statements	financial statements	financial statements
	2018	2017	2018	2017
<i>Short-term loans</i>				
<b>Subsidiaries</b>				
At 1 January	-	-	476	655
Increase	-	-	251	886
Decrease	-	-	(120)	(1,065)
<b>At 31 December</b>	<b>-</b>	<b>-</b>	<b>607</b>	<b>476</b>
<b>Joint venture</b>				
At 1 January	-	-	-	-
Increase	235	-	235	-
Effect of change in exchange rates	7	-	7	-
<b>At 31 December</b>	<b>242</b>	<b>-</b>	<b>242</b>	<b>-</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

*Loans to related parties (continue)*

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Short-term loans</b>				
<b>Total</b>				
At 1 January	-	-	476	655
Increase	235	-	486	886
Decrease	-	-	(120)	(1,065)
Effect of change in exchange rates	7	-	7	-
<b>At 31 December</b>	<b>242</b>	<b>-</b>	<b>849</b>	<b>476</b>
<b>Long-term loans</b>				
<b>Subsidiaries</b>				
At 1 January	6,665	-	6,665	-
Increase	-	8,060	-	8,060
Decrease	(3,212)	(1,128)	(3,212)	(1,128)
Effect of change in exchange rates	98	(267)	98	(267)
<b>At 31 December</b>	<b>3,551</b>	<b>6,665</b>	<b>3,551</b>	<b>6,665</b>
<b>Investments in subsidiaries (Note 11)</b>	<b>-</b>	<b>-</b>	<b>67,783</b>	<b>56,859</b>
<b>Investments in joint ventures (Note 12)</b>	<b>30,758</b>	<b>27,577</b>	<b>15,373</b>	<b>15,373</b>
<b>Investments in associates (Note 12)</b>	<b>15,450</b>	<b>14,002</b>	<b>9,793</b>	<b>9,323</b>

*Trade accounts payable - related parties*

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Parent	23,678	23,189	23,604	23,147
Subsidiaries	-	-	36	81
Joint ventures	562	362	60	30
Associates	1,817	1,662	792	778
Other related parties	2,110	1,572	1,655	1,350
<b>Total</b>	<b>28,167</b>	<b>26,785</b>	<b>26,147</b>	<b>25,386</b>

*Other payables - related parties*

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Parent	43	36	20	20
Subsidiaries	-	-	1,121	652
Joint ventures	7	13	3	10
Associates	150	143	109	100
Other related parties	143	805	124	788
<b>Total</b>	<b>343</b>	<b>997</b>	<b>1,377</b>	<b>1,570</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### *Payables to contractor - related parties*

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Parent	-	-	569	443
Associates	81	68	51	48
Other related parties	24	8	3	8
<b>Total</b>	<b>105</b>	<b>76</b>	<b>623</b>	<b>499</b>

### *Loans from related parties*

	Interest rate		Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017	2018	2017
	<i>(% per annum)</i>		<i>(in million Baht)</i>			
<b>Short-term loans</b>						
Subsidiaries	1.10	1.08 - 1.39	-	-	1,931	2,558
<b>Total</b>			<b>-</b>	<b>-</b>	<b>1,931</b>	<b>2,558</b>
<b>Long-term loans</b>						
Subsidiary	4.68	-	-	-	16,105	-
<b>Total</b>			<b>-</b>	<b>-</b>	<b>16,105</b>	<b>-</b>
<b>Summary of loans from related parties</b>						
Short-term loans			-	-	1,931	2,558
Long-term loans			-	-	16,105	-
<b>Total loans from related parties</b>			<b>-</b>	<b>-</b>	<b>18,036</b>	<b>2,558</b>

Movements during the year ended 31 December 2018 and 2017 of loans from related parties were as follows:

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Short-term loans</b>				
<b>Subsidiaries</b>				
At 1 January	-	-	2,558	1,514
Increase	-	-	105	1,060
Decrease	-	-	(732)	(16)
<b>At 31 December</b>	<b>-</b>	<b>-</b>	<b>1,931</b>	<b>2,558</b>
<b>Long term loans</b>				
<b>Subsidiary</b>				
At 1 January	-	-	-	-
Increase	-	-	16,473	-
Effect of change in exchange rate	-	-	(300)	-
	-	-	<b>16,173</b>	-
Less Deferred financing cost	-	-	(68)	-
<b>At 31 December</b>	<b>-</b>	<b>-</b>	<b>16,105</b>	<b>-</b>



**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

***Significant agreements with related parties***

As at 31 December 2018, the Group has significant agreements with related parties as follows:

***Olefins Sales and Purchase Agreements***

The Company has 4 Ethylene sales and purchase agreements with a parent company and 2 related parties. Selling prices are determined based on Ethylene price in the world market. These agreements are for the periods from 7 years to 21 years, commencing from the effective date specified in each agreement. One agreement that is expired in July 2019 is automatically renewed except for advance cancellation not less than 1 year through written notice by each party. Other three agreements will expire in December 2021, May 2022 and December 2027.

The Company has 4 Propylene sales and purchase agreements with 3 related parties. Selling prices are determined based on Polypropylene and Propylene prices in the world market. Three agreements are for the periods from 4 years to 15 years, commencing from the effective date specified in each agreement and expiring in December 2020, December 2023 and December 2026 and another agreement is for the period 15 years, start from the plant commercial operation date.

***By-Product Sales and Purchase Agreements***

The Company has a Hydrogen sales and purchase agreement with 2 related parties. Selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in March 2024 and another agreement is for the period of 15 years, start from the plant commercial operation date or one hundred and eighty (180) days from the first date of counter party's plant start receiving product from the company, whichever occurs earlier.

The Company has a Tail Gas sales and purchase agreement with a related party. Selling price in the agreement is determined based on Natural Gas price for the industry. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in August 2021.

The Company has a Butene sales and purchase agreements with a related party. Selling price in the agreement is determined based on Butene in the world market. The agreement is for the period of 1 year, commencing from the date as specified in the agreement and expiring in December 2019.

***Utilities and Other Services Agreements***

The Company has 3 Power Supply agreements with 3 related parties. Selling prices in these agreements are determined based on reference price from the Provincial Electricity Authority. These agreements are for the period of 6 years 8 months and 15 years, commencing from the date as specified in each agreement and expiring in September 2022, June 2027 and September 2028.

The Company has 6 Utilities agreements covering electricity, steam and demineralised water with a related party. These agreements are for the periods from 12 years to 19 years 9 months, commencing from the date as specified in each agreement and expiring in December 2028.

The Company and certain related parties have various Utilities agreements for the industries covering electricity, steam, and water with a related party. These agreements are for the periods from 15 years to 20 years, commencing from the date as specified in each agreement and expiring from December 2021 to June 2033 and two agreements are for the period 15 years, start from the plant commercial operation date. All agreements can be renewed for the period of 5 years with the terms and conditions agreed by both parties.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

### **For the year ended 31 December 2018**

The Company has a Product Transportation agreement with a related party. The agreement is for the period of 3 years, commencing from the date as specified in the agreement and expiring in November 2021. The agreement is automatically renewed for the period of 3 years and two more periods can be renewed, except for advance cancellation through written notice by each party.

#### ***Feedstock and Fuel Gas Sales and Purchase Agreements***

The Company has 3 LPG sales and purchase agreements with a parent company. The selling price is determined based on the Polypropylene price. The agreement is for the period from 8 years 7 months to 15 years, commencing from the date as specified in the agreement. Two agreements will expire in December 2020 and one agreement will expire in May 2021.

The Company has a Natural Gas sales and purchase agreement with a parent company. The selling price is determined based on gas price as specified in the agreement. The agreement is for the period of 20 years, commencing from the date as specified in the agreement. Subsequently, the agreement is renewed for the period of 2 years 3 months and expiring in March 2021.

The Company has 2 Natural Gas sales and purchase agreements with a parent company. Selling prices are determined based on gas price as specified in the agreement and Thailand Producer Price Index as classification of products by activity (CPA). These agreements are for the period of 10 years, commencing from the date as specified in each agreement and expiring in May 2023 and December 2029.

The Company and 2 related parties have various Natural Gas sales and purchase agreements with a parent company. Selling price in an agreement is determined based on fuel oil prices and Thailand Producer Price Index (PPI). These agreements are for the periods from 10 years to 15 years, commencing from the date as specified in each agreement and expiring from November 2019 to December 2029.

The Company has a Natural Gas Liquid sales and purchase agreement with a parent company. The selling price is determined based on the standard price of Naphtha in the region. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in May 2021. The agreement is renewable for the period of 5 years with the agreement of both parties.

The Company has 2 Ethane, Propane and LPG sales and purchase agreements with a parent company. Selling price in the agreement is determined based on the high density Polyethylene and Polypropylene price and another agreement is determined based on the high density Polyethylene price. These agreements have been extended and consequently will expire in December 2020.

The Company has an Ethane sales and purchase agreement with a parent company. The selling price is determined based on prices prevailing in the high density Polyethylene price in the world market. The agreement is for the period of 15 years, commencing from the date as specified in the agreement and expiring in January 2025. The agreement is renewable for 5 years with the agreement of both parties by providing not less than 1 year advance written notice to the counterparty.

The Company has an Ethane Rich Gas sales and purchase agreement with a related party. The selling price is determined based on prevailing prices of Polyethylene and Polypropylene in the region. This agreement is for the period of 10 years and will expire in January 2021.

From 1 August 2012, the Company has entered into the adjustment of the pricing formula in the sales and purchase agreements of petrochemical natural gas feedstock with a parent company.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

**For the year ended 31 December 2018**

### ***Petroleum Product Offtake Agreement***

The Company has a Petroleum Product sales and purchase agreement with a parent company and a related party. For domestic sales, the product price reflects prices prevailing in Thailand for products of a similar quality that are sold in or imported to Thailand. For export sales, the product price reflects the prevailing international spot price for that product. These agreements are for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

### ***Expansion Phase Product Offtake Agreement***

The Company has an expansion phase product offtake agreement with a parent company and a related party, whereas a parent company agree to purchase 100% of the volume of refined petroleum products produce by reforming and upgrading complexes. As specified in the Product Offtake Agreement, at least 50% of such volume will be sold at a competitive domestic market price and the remaining sold at a competitive export market price or other mutually agreed price. The agreement is for the period of 18 years, commencing from the date as specified in the agreement and expiring in February 2024. The agreement is automatically renewed except for advance cancellation through written notice by each party.

### ***Long-term Crude Oil and Other Raw materials Supply Agreements***

The Company entered into 2 supply agreements for crude oil and other raw materials with a parent company, the reference price being based on market price of crude oil and other raw materials. These agreements are for the periods of 18 years and 20 years, will expire in December 2019 and February 2024. The agreements are automatically renewed except for advance cancellation through written notice by each party.

### ***Crack Spread Swap Agreements***

The Company has entered into crack spread swap agreements with a related party to hedge the Company's oil refinery margin. Under the agreements the floating amount of the basket refinery margin, (calculated based on the Singapore price of refined petroleum products, Gasoil, Kerosene and Fuel Oil against the price of Dubai crude oil), is swapped for a fixed amount of the basket refinery margin for a fixed quantity per month. Under the agreement, the Company shall make payment or receive of the crack spread difference according to terms and conditions stipulated in the agreements.

### ***Crude Oil Price Hedging Agreements***

The Company has entered into crude oil price hedging agreements to mitigate price risk with a related party. As at 31 December 2018, the Company has no oil volume under the agreement.

### ***Sales and Purchase Aromatics Product Agreements***

The Company, a parent company, related parties and various other companies have entered into raw material and product sales and purchase agreements. The sales and purchase prices of raw material and product are based on the prices specified in the agreements. These agreements are for the periods from 1 year to 11 years 9 months, commencing from the effective date as specified in each agreement. The agreements will expire in March 2019, December 2019 and December 2026. Other agreements are automatically renewed except for a 1-2 years advance cancellation through written notice by each party.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

**For the year ended 31 December 2018**

### ***Polyethylene Sales and Purchase Agreements***

The Company and a related party have 2 Polyethylene sales and purchase agreements with a related party. The Company agrees to sell all Polyethylene to a related party for distributing to the customers in the market. Under which the Polyethylene pricing structure is changed to link to the Polyethylene product price, that the Company sells to end customers, adjusted by the appropriate marketing expenses for fairness to both parties. These agreements are for the period of 15 years, commencing from the effective date as specified in each agreement. One agreement will expire in December 2021 and another will expire in June 2023.

### ***Lending and Borrowing Agreements***

The Company has unsecured short-term lending agreements for the period of 3 years through Liquidity Management System “LMS” with 6 related parties with the credit facility of Baht 1,000 million, Baht 800 million, Baht 350 million, Baht 300 million, Baht 80 million and Baht 40 million. These loans bear interest based on market rate referenced to BIBOR O/N plus interest rate spread.

The Company has an unsecured short-term lending agreement for the period of 1 year with related party with the credit facility of USD 7.5 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has an unsecured long-term lending agreement for the period of 3.5 years with related party with the credit facility of USD 238.36 million. This loan bears interest based on market rate referenced to LIBOR plus interest rate spread.

The Company has unsecured short-term borrowing agreements for the period of 3 years through Liquidity Management System “LMS” with 6 related parties with the credit facility of Baht 4,000 million, Baht 400 million, Baht 200 million, Baht 60 million and Baht 50 million. These loans bear interest based on market rate referenced to BIBOR O/N minus interest rate spread.

The Company has unsecured long-term borrowing agreement for the period of 4.2 years with related party with the credit facility of USD 495.89 million. These loans bear interest at the fixed rate.

### ***Service Agreements***

The Company has Shared Service agreements with 22 related parties for the provision of general services. All of these agreements are effective from the date as specified in the agreements and the service charges will be agreed in the fourth quarter of each year.

The Company has a Technical Services agreement with a related party. Under which the Company agreed to obtain certain technical advisory services. The agreement is for the period of 3 years 4 months and will expire in December 2019.

The Company has Management and Engineering agreement, Design, Supply, Construction and Installation agreement, Inspection of Construction, Equipment and Machinery agreement and Management and Maintenance Work agreement with a related party. These agreements are for the periods from 1 year 4 months to 5 years, commencing from the date as specified in the agreements and expiring in June 2023.

The Company has 3 Services agreements to have the right to lay the pipelines for delivery of raw material and product on pipeline structure with a parent company. These agreements are for the period of 15 years from the agreement date and will expire in June 2025.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

### **For the year ended 31 December 2018**

The Company has a Security Service agreement with a related party. Under which the related party agrees to provide security service to asset, employees and visitors in the location of the Company. The agreement is for the period of 2 years and will expire in December 2020.

The Company has a Safety Inspection Service agreement and an Emergency Control Center agreement with a related party. These agreements are for the period from 2 years to 3 years and will expire in December 2020 with service rate as stipulated in the agreement.

The Company has Warehouse Management agreements with a related party. The agreements are for the periods from 1 years to 21 years 3 months and expiring in December 2030.

The Company has a Logistics Services agreement with a related party. The agreement is for the period of 3 years 1 month and will expire in December 2020.

The Company has entered into 2 Information and Communication Technology Service agreements with a related party. Under which the related party agrees to provide Information Technology system maintenance and support services, system structure and data centre management, system supporting and advisory, including system design and development as the Company's requirements. These agreements are for the periods from 1 years to 15 years, commencing from the date as specified in the agreements and expiring in December 2019 and December 2027.

The Company has Share Service agreement for Engineering, Procurement and Construction (EPC) Phase with 2 related parties. The agreement is effective from the date as specified in the agreement for the period of 3 years. This agreement will expire at least 6 months before the completion of EPC Phase and can be terminated by providing not less than 3 months advance written notice to the counter party.

#### ***Rental Agreements***

The Company has Office Rental and Service agreement with a related party. The agreement is for the period of 3 year and will expire in September 2021 with rental and service rate and conditions as stipulated in the agreement.

The Company has entered into Land Lease agreement with a parent company to operate jetty and buffer tank farm services. The agreement is for the period of 22 years 6 months, commencing from the date signed in the agreement by both parties, and will expire in December 2037 with land lease rate and condition as specified in the agreement.

The Company has various Land Lease agreements with related parties. These agreements are for the periods from 14 years to 16 years, commencing from the date as specified in the agreements, and will expire in October 2033 with land lease rate and condition as specified in the agreement.

A Subsidiary has Land Lease and Office Rental agreements with 2 related parties and other companies. These agreements are for the periods from 10 months to 30 years, commencing from the date as specified in the agreements and the renewal of the contract will be subject to negotiation with the counter party.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### *Sales and Purchase agreement for land and properties*

A Subsidiary has entered into a Sales and Purchase agreement for land and properties with a parent company to support future investments in accordance with the direction and long-term strategy of the Group. The subsidiary paid all contract amount and registered the ownership at the land office on 29 June 2018. These land and properties consist of investment properties of Baht 5,759 million, land and buildings of Baht 1,185 million, totalling Baht 6,944 million.

## 7 Cash and cash equivalents

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Cash on hand	76	2	2	2
Cash and highly liquid current investments (Private funds)	533	443	533	443
Cash at banks - current accounts	1,679	1,032	4	5
Cash at banks - savings accounts	16,037	10,119	10,978	3,340
Cash at banks - foreign accounts	1,624	1,849	322	1,453
Highly liquid current investments	16,795	29,984	15,303	29,193
<b>Total</b>	<b>36,744</b>	<b>43,429</b>	<b>27,142</b>	<b>34,436</b>

## 8 Trade accounts receivable

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
		<i>(in million Baht)</i>			
Related parties	6	17,601	19,776	25,708	26,536
Other parties		24,433	21,954	9,144	8,440
<b>Total</b>		<b>42,034</b>	<b>41,730</b>	<b>34,852</b>	<b>34,976</b>
Less allowance for doubtful accounts		(43)	(33)	(19)	(19)
<b>Net</b>		<b>41,991</b>	<b>41,697</b>	<b>34,833</b>	<b>34,957</b>
(Reversal of) bad and doubtful debts expense for the year		11	(19)	-	-

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

Aging analyses for trade accounts receivable were as follows:

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Related parties</b>				
Within credit terms	17,579	19,686	25,271	26,367
Overdue:				
Less than 3 months	21	86	437	169
3 - 6 months	1	4	-	-
6 - 12 months	-	-	-	-
Over 12 months	-	-	-	-
	<u>17,601</u>	<u>19,776</u>	<u>25,708</u>	<u>26,536</u>
<i>Less allowance for doubtful accounts</i>	-	-	-	-
<b>Net</b>	<b><u>17,601</u></b>	<b><u>19,776</u></b>	<b><u>25,708</u></b>	<b><u>26,536</u></b>
<b>Other parties</b>				
Within credit terms	23,798	21,310	9,125	8,362
Overdue:				
Less than 3 months	589	608	-	59
3 - 6 months	2	-	-	-
6 - 12 months	7	-	-	-
Over 12 months	37	36	19	19
	<u>24,433</u>	<u>21,954</u>	<u>9,144</u>	<u>8,440</u>
<i>Less allowance for doubtful accounts</i>	(43)	(33)	(19)	(19)
<b>Net</b>	<b><u>24,390</u></b>	<b><u>21,921</u></b>	<b><u>9,125</u></b>	<b><u>8,421</u></b>
<b>Total</b>	<b><u>41,991</u></b>	<b><u>41,697</u></b>	<b><u>34,833</u></b>	<b><u>34,957</u></b>

The normal credit term granted by the Group ranges from 14 days to 90 days.

**9 Other receivables**

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Prepaid expenses	1,503	1,642	947	1,257
Receivable from oil hedging contracts	436	39	436	39
Accrued income	488	583	560	705
Other account receivables	693	356	697	690
Receivable from Revenue Department	117	126	-	-
Others	388	213	137	86
<b>Total</b>	<b><u>3,625</u></b>	<b><u>2,959</u></b>	<b><u>2,777</u></b>	<b><u>2,777</u></b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 10 Inventories

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Finished goods	15,551	14,805	10,574	10,878
Work in progress	1,823	1,759	1,266	1,171
Raw materials	8,870	7,002	7,147	5,477
Factory supplies and spare parts	9,992	9,228	7,834	7,516
Goods in transit	4,750	5,180	3,701	4,111
<b>Total</b>	<b>40,986</b>	<b>37,974</b>	<b>30,522</b>	<b>29,153</b>
Less allowance for decline in value	(1,366)	(12)	(1,330)	-
allowance for obsolescence	(254)	(207)	(87)	(81)
<b>Net</b>	<b>39,366</b>	<b>37,755</b>	<b>29,105</b>	<b>29,072</b>
Inventories recognised as an expense in 'cost of sales of goods':				
- Cost	462,756	380,366	416,495	331,386
- (Reversal of) write-down to net realisable value	1,347	(13)	1,330	-
<b>Net</b>	<b>464,103</b>	<b>380,353</b>	<b>417,825</b>	<b>331,386</b>

As at 31 December 2018 and 2017, the Company's inventories included petroleum legal reserve of 341 million liters with approximated value of Baht 4,752 million and 353 million liters with approximated value of Baht 4,671 million, respectively.

### 11 Investments in subsidiaries

	Separate financial statements	
	2018	2017
	<i>(in million Baht)</i>	
<b>Subsidiaries</b>		
At 1 January	56,859	55,286
Acquisition	11,694	6,001
Capital distribution	(41)	-
Impairment losses	(729)	(4,428)
<b>At 31 December</b>	<b>67,783</b>	<b>56,859</b>



**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

Investments in subsidiaries as at 31 December 2018 and 2017, and dividend income from those investments for the years then ended, were as follows:

	Ownership Interest		Separate financial statements				Fair value of listed securities		Dividend income					
	2018	2017	Paid-up capital		Cost		At cost-net		2018	2017				
	(%)	(%)	2018	2017	2018	2017	2018	2017	2018	2017				
<b>Subsidiaries</b>														
Global Green Chemicals Plc.	72	72	10,237	10,237	7,400	7,400	-	-	7,400	7,400	7,289	11,322	148	370
GC Glycol Co., Ltd. (Formerly TOC Glycol Co., Ltd.)	100	100	5,395	5,395	5,395	5,395	-	-	5,395	5,395	-	-	1,079	2,158
GC Polyols Co., Ltd.	82	82	1,281	763	1,052	626	-	-	1,052	626	-	-	-	-
GC Marketing Solutions Co., Ltd. (Formerly PTT Polymer Marketing Co., Ltd.)	99	99	40	40	451	451	-	-	451	451	-	-	21	123
GC Maintenance and Engineering Co., Ltd. (Formerly PTT Maintenance and Engineering Co., Ltd.)	100	100	137	137	155	155	-	-	155	155	-	-	-	-
GC Logistics Solutions Co., Ltd. (Formerly PTT Polymer Logistics Co., Ltd.)	99	99	1,200	1,200	1,607	1,607	-	-	1,607	1,607	-	-	-	-
GC Ventures Co., Ltd.	100	-	144	-	144	-	-	-	144	-	-	-	-	-
GC Treasury Center Co., Ltd.	100	100	10	3	10	3	-	-	10	3	-	-	-	-
GC Styrenics Co., Ltd. (Formerly Thai Styrenics Co., Ltd.)	100	100	190	190	190	190	-	-	190	190	-	-	-	-
GC Estate Co., Ltd.	100	-	7,200	-	7,200	-	-	-	7,200	-	-	-	-	-
GC Oxirane Co., Ltd.	100	100	2,392	2,212	2,392	2,212	-	-	2,392	2,212	-	-	-	-
Solution Creation Co., Ltd.	100	100	183	166	183	166	-	-	183	166	-	-	-	-
Thai Tank Terminal Co., Ltd.	51	51	900	900	459	459	-	-	459	459	-	-	542	509

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

	Ownership Interest		Separate financial statements								Fair value of listed securities		Dividend income	
	2018	2017	Paid-up capital		Cost		Impairment		At cost-net		2018	2017	2018	2017
		(%)	2018	2017	2018	2017	2018	2017	2018	2017				
<i>Subsidiaries (continue)</i>														
Bio Spectrum Co., Ltd. (In process of liquidation)	100	100	146	146	96	96	(95)	(95)	1	1	-	-	-	-
PTT Phenol Co., Ltd.	100	100	11,851	11,851	13,155	13,155	-	-	13,155	13,155	-	-	1,122	-
Siam Mitsui PTA Co., Ltd.	49	-	4,800	-	2,903	-	-	-	2,903	-	-	-	-	-
NPC Safety and Environmental Service Co., Ltd.	100	100	165	165	165	165	-	-	165	165	-	-	-	-
Auria BioChemicals Co., Ltd. (In process of liquidation)	54	54	90	90	8	49	(7)	(7)	1	42	-	-	-	-
PTTGC International Private Limited (Formerly PTT Chemical International Pte. Ltd.)	100	100	30,785	29,968	30,785	29,968	(10,226)	(9,497)	20,559	20,471	-	-	-	-
PTTGC America Corporation	100	100	-	-	4,361	4,361	-	-	4,361	4,361	-	-	-	-
<b>Total</b>					<b>78,111</b>	<b>66,458</b>	<b>(10,328)</b>	<b>(9,599)</b>	<b>67,783</b>	<b>56,859</b>	<b>7,289</b>	<b>11,322</b>	<b>2,912</b>	<b>3,160</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

#### *Change in investment in subsidiaries*

On 11 January 2018, Solution Creation Co., Ltd. has called for paid capital from the capital increase by the Extraordinary General Meeting of shareholders of the subsidiary held on 4 September 2017 to invest in TPBI & Myanmar Star Co.,Ltd. at Baht 16.75 million, of which fully received in January 2018.

At the Board of Directors' Meeting of the Company held on 18 December 2017, the Board approved to establish GC Estate Co., Ltd. which is 100% shareholding by the Company, for developing estate for rent to invest in petrochemical and related industries. Subsequently on 23 January 2018, GC Estate Co., Ltd. registered the initial authorised share capital of Baht 1.01 million and called for paid-up capital of 10,100 shares at Baht 100 per share, totalling Baht 1.01 million, of which fully received in January 2018. Subsequently, at the Annual General Meeting of shareholders of the subsidiary held on 21 March 2018, the shareholders approved to increase the registered capital to Baht 1,300 million and called for paid-up capital of 12.99 million shares at Baht 100 per share, totalling Baht 1,298.99 million, of which fully received in March 2018. Subsequently, at the Extraordinary General Meeting of shareholders of the subsidiary held on 20 June 2018, the shareholders approved to increase the registered capital to Baht 7,200 million and called for paid-up capital of 59 million shares at Baht 100 per share, totalling Baht 5,900 million, of which fully received in June 2018.

On 22 March 2018, GC Treasury Center Co., Ltd. has called for paid capital from the capital increase by the Annual General Meeting of shareholders of the subsidiary held on 21 March 2018 at 75,000 shares, Baht 100 per share, totalling Baht 7.50 million, of which fully received in January 2018.

At the Board of Directors' Meeting of the Company held on 21 May 2018, the Board approved to establish GC Ventures Co., Ltd. ("GCV") for investment in Corporate Venture Capital (CVC) which is 100% owned by the Company. On 22 May 2018, GCV registered the initial authorised share capital of Baht 5 million and called for paid-up capital of 0.05 million shares at Baht 100 per share, totalling Baht 5 million, of which fully received in May 2018. Subsequently, at the Annual General Meeting of shareholders of the subsidiary held on 8 June 2018, the shareholders approved to increase the registered capital to Baht 144 million and called for paid-up capital of 1.39 million shares at Baht 100 per share, totalling Baht 139 million, of which fully received in June 2018.

On 31 August 2018, PTTGC International Private Limited has called for paid capital from the capital increase by the Board of Directors Meeting held on 20 November 2009 for the purpose of corporate and its subsidiary operation at SGD 1.12 million or equivalent to Baht 27.15 million, of which fully received in August 2018.

On 8 November 2018, GC Oxirane Co., Ltd. has called for paid capital from the capital increase by the Board of Directors Meeting held on 22 May 2017 for conducting a Propylene Oxide Project at Baht 179.73 million, of which fully received in December 2018.

On 8 August 2018, the Company and a subsidiary entered into the Shares Purchase Agreement to acquire 74% share (49% direct interest and 25% indirect interest) of Siam Mitsui PTA Company Limited, Purified Terephthalic Acid producer, and 74% share (74% indirect interest) of Thai PET Resin Company Limited, Polyethylene Terephthalate resin producer, from SCG Chemicals Co., Ltd. and Mitsui Chemicals, Inc. Subsequently on 27 December 2018, the Group completed the share acquisition of subsidiaries for a preliminary cash consideration of approximately Baht 4,123 million. The final purchase price was settled with the seller for an additional payment of approximately Baht 1,249 million, which will be paid in March 2019.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

### **For the year ended 31 December 2018**

During the year ended 31 December 2018, PTTGC International Private Limited has called for paid-up capital from the capital increase by the Board of Directors' Meeting held on 18 December 2017 to invest in PTTGC Innovation America Corp. at USD 25 million or equivalent to Baht 790.71 million, to finance the loan prepayment in order to reduce the Group's finance cost and for subsidiary operation, of which fully received during the year ended 31 December 2018.

During the year ended 31 December 2018, GC Polyols Co., Ltd. has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the Company held on 22 May 2017 for conducting a Polyols & PU System Project at Baht 425.69 million, of which fully received during the year ended 31 December 2018.

On 14 February 2017, Solution Creation Co., Ltd. has called for paid capital from the capital increase by the Extraordinary General Meeting of shareholders of the subsidiary held on 14 February 2017 to invest in S.P. Petpack Inter Group Co., Ltd. at Baht 50 million, of which fully received in February 2017.

At the Board of Directors' Meeting of the Company held on 22 May 2017, the Board approved to establish GC Oxirane Co., Ltd. for conducting a Propylene Oxide Project which is 100% owned by the Company. Subsequently on 2 June 2017, GC Oxirane Co., Ltd. registered the initial authorised share capital of Baht 5,530 million and called for paid-up capital of 55.30 million shares at Baht 25 per share, totalling Baht 1,382.50 million, of which fully received in June 2017. Subsequently on 5 October 2017, the Board of Directors' Meeting approved to call for the additional paid-up capital of the remaining share capital at Baht 15 per share, totaling Baht 829.50 million, of which fully received in October 2017.

At the Board of Directors' Meeting of the Company held on 22 May 2017, the Board approved to establish GC Polyols Co., Ltd. ("GCP") for conducting a Polyols & PU System Project which is 100% owned by the Company. On 2 June 2017, GCP registered the initial authorised share capital of Baht 2,502 million and called for paid-up capital of 25.02 million shares at Baht 25 per share, totalling Baht 625.50 million, of which fully received in June 2017. Subsequently on 25 August 2017, the Company entered into a joint venture agreement with Sanyo Chemical Industries, Ltd. and Toyota Tsusho Corporation. GCP increased the registered capital to Baht 3,050 million and called for paid-up capital by the Extraordinary meeting of shareholder of subsidiary held on 11 September 2017 at 5.48 million shares at Baht 25 per share, totalling Baht 137 million, of which fully paid in September 2017. GCP registered an increase in share capital with the Ministry of Commerce on 5 October 2017.

On 6 June 2017, PTTGC International Private Limited has called for paid-up capital from the capital increase by the Board of Directors' Meeting of the subsidiary held on 20 February 2014 to invest in PTTGC International (Netherlands) B.V. ("PTTGC NL") for the purpose of investing in Vencorex Holding S.A.S. ("Vencorex") which a subsidiary holds an interest through PTTGC NL and for the purpose of corporate operation at EUR 31.37 million or equivalent to Baht 1,202.94 million, of which fully received in June 2017. Subsequently on 21 June 2017, PTTGC NL in which the Company holds a 100% interest through a subsidiary CH Inter, settled the payment of 34% of the share capital in Vencorex which PTTGC NL acquired from Perstorp Holding AB ("Perstorp") since 28 August 2014, and as a result its shareholding interest in Vencorex also increased by 5.82% from 85% to 90.82% in accordance with the terms of the agreement. The Group paid for the additional share capital totalling EUR 31.09 million (approximately Baht 1,168.63 million).

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

At the Board of Directors' Meeting of the Company held on 30 October 2017, the Board approved to established GC Treasury Center Co., Ltd. ("GCTC") for liquidity management and financing vehicle of the Group which is 100% owned by the Company. Subsequently on 19 December 2017, GCTC registered the initial authorised share capital of Baht 5 million and called for paid-up capital of 0.05 million shares at Baht 50 per share, totaling Baht 2.50 million, of which fully received in December 2017.

During the year ended 31 December 2017, PTTGC International Private Limited has called for paid capital from the capital increase by the Board of Directors' Meeting of the subsidiary held on 21 December 2016 to invest in PTTGC Innovation America Corp. at USD 7.61 million of equivalent to Baht 266.86 million, of which fully received during the year ended 31 December 2017.

During the year ended 31 December 2017, PTTGC America Corporation has called for paid capital from the capital increase by the Board of Directors' Meeting held on 29 June 2015 for the purpose of US Petrochemical Complex project at USD 13.20 million of equivalent to Baht 453.16 million, of which fully received during the year ended 31 December 2017.

#### *Impairment loss on investment in subsidiary*

During the year ended 31 December 2018, the Company recognised impairment loss on the investment in PTTGC International Private Limited totalling Baht 729.56 million in the separate financial statements. Impairment loss Baht 727.65 million as the recoverable amount of investment in PTTGC Innovation America Corp. was less than its carrying amount. Impairment loss on investment resulted from the capital increase to finance the loan prepayment in order to reduce the Group's finance cost and impairment loss Baht 1.91 million as the recoverable amount of investment in PTT Chemical International (Asia Pacific ROH) Limited ("AP ROH") was less than its carrying amount due to the dissolution of AP ROH. On 30 November 2016, AP ROH registered the dissolution with Department of Business Development, Ministry of Commerce. AP ROH has finalised the liquidation process on 30 November 2018.

During the year ended 31 December 2017, the Company recognised impairment loss on the investment in PTTGC International Private Limited and Auria BioChemicals Co., Ltd. totalling Baht 4,420.97 million and 7.25 million, respectively in the separate financial statements as the recoverable amount of investment was less than its carrying amount due to change in operation plan of PTTGC Innovation America Corp. to become open innovation and technology scouting, according to the Company's strategy on research and development and also the approval on the cancelation of Joint Venture Agreement between the Company and PTTGC Innovation America Corp. in Auria BioChemicals Co., Ltd.

#### *Initial public offering of Global Green Chemicals Plc. ordinary shares*

On 2 May 2017, Global Green Chemicals Plc. ("GGC") which is a subsidiary of the Company completed its Initial Public Offering ("IPO") on the Stock Exchange of Thailand by issuing 246.67 million new ordinary shares with an offering price of Baht 11.20 per share (par value of Baht 10 per share and share premium of Baht 1.20 per share) amounting to Baht 2,763 million with over-allotment of 37 million shares from the Company to the Over-allotment Agent in order to deliver them to the subscribers of GGC shares. Subsequently on 2 June 2017, the Over-allotment Agent procured shares in order to deliver them to the Company by means of exercising its over-allotment option to purchase newly issued ordinary shares from GGC. GGC has sold these shares to the Over-allotment Agent and increased its paid-up capital, and the Over-allotment Agent has returned the shares to the Company. Therefore, the Group received proceeds from issuing 283.67 million ordinary shares of GGC with price of Baht 11.20 per share, totalling of Baht 3,177 million.

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

Details of the change in ownership are as follows:

	<b>Consolidated financial statements</b> <i>(in million Baht)</i>
Consideration received	3,177
Less Transaction costs from issuance of Global Green Chemicals Plc.'s ordinary shares	(121)
<b>Net</b>	<b>3,056</b>
Dilution of ownership interest to non-controlling interest	(3,027)
<b>Change in parent's equity</b>	<b>29</b>

As a result of IPO, the Company's ownership interest in Global Green Chemicals Plc. decreased from 100% to 72.29%.

*Others*

On 25 April 2018, Auria BioChemicals Co., Ltd. which is a subsidiary of the Company registered the dissolution with Department of Business Development, Ministry of Commerce. Subsequently on 19 December 2018, Auria BioChemicals Co., Ltd. distributed capital to the Company amounting to Baht 40.77 million. As at 31 December 2018, the aforementioned Company is in the liquidation process.

**12 Investments in joint ventures and associates**

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Joint ventures</b>				
At 1 January	27,577	26,285	15,373	-
Acquisitions	-	-	-	15,373
Share of profit of investment in joint ventures	5,209	4,111	-	-
Share of other comprehensive income (loss) of joint ventures	(374)	466	-	-
Dividend income	(1,654)	(3,285)	-	-
<b>At 31 December</b>	<b>30,758</b>	<b>27,577</b>	<b>15,373</b>	<b>15,373</b>
<b>Associates</b>				
At 1 January	14,002	13,026	9,323	9,323
Acquisitions	489	80	470	-
Share of profit of investment in associates	1,686	1,461	-	-
Share of other comprehensive income (loss) of associates	5	(2)	-	-
Dividend income	(732)	(563)	-	-
<b>At 31 December</b>	<b>15,450</b>	<b>14,002</b>	<b>9,793</b>	<b>9,323</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Total</b>				
At 1 January	41,579	39,311	24,696	9,323
Acquisitions	489	80	470	15,373
Share of profit of investment in joint ventures and associates	6,895	5,572	-	-
Share of other comprehensive income (loss) of joint ventures and associates	(369)	464	-	-
Dividend income	(2,386)	(3,848)	-	-
<b>At 31 December</b>	<b><u>46,208</u></b>	<b><u>41,579</u></b>	<b><u>25,166</u></b>	<b><u>24,696</u></b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

Investments in joint ventures and associates as at 31 December 2018 and 2017, and dividend income for the years then ended were as follows:

	<b>Consolidated financial statements</b>													
	Ownership interest		Paid-up capital		Cost		Equity		Impairment		Equity - net		Dividend income	
	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017
	(%)		(in million Baht)											
<b>Direct joint ventures</b>														
PTT Asahi Chemical Co., Ltd.	50	50	13,819	13,819	996	996	9,569	6,555	-	-	9,569	6,555	-	-
PTT MCC Biochem Co., Ltd.	50	50	1,860	1,860	160	160	206	452	-	-	206	452	-	-
HMC Polymers Co., Ltd.	41	41	3,790	3,790	14,217	14,217	12,885	12,848	-	-	12,885	12,848	1,242	2,195
					<b>15,373</b>	<b>15,373</b>	<b>22,660</b>	<b>19,855</b>	<b>-</b>	<b>-</b>	<b>22,660</b>	<b>19,855</b>	<b>1,242</b>	<b>2,195</b>
<b>Indirect joint ventures</b>														
Thai Ethoxylate Co., Ltd.	50	50	420	420	210	210	736	709	-	-	736	709	91	72
Emery Oleochemicals (M) Sdn. Bhd.	50	50	4,530	4,530	4,966	4,966	4,519	4,526	-	-	4,519	4,526	-	-
Emery Specialty Chemicals Sdn. Bhd.	50	50	818	818	407	407	-	-	-	-	-	-	-	-
Nature Works LLC	50	50	43,167	43,167	4,793	4,793	2,843	2,487	-	-	2,843	2,487	321	1,018
					<b>10,376</b>	<b>10,376</b>	<b>8,098</b>	<b>7,722</b>	<b>-</b>	<b>-</b>	<b>8,098</b>	<b>7,722</b>	<b>412</b>	<b>1,090</b>
<b>Total - joint ventures</b>					<b>25,749</b>	<b>25,749</b>	<b>30,758</b>	<b>27,577</b>	<b>-</b>	<b>-</b>	<b>30,758</b>	<b>27,577</b>	<b>1,654</b>	<b>3,285</b>



**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

<b>Consolidated financial statements</b>															
	Ownership interest		Paid-up capital		Cost		Equity		Impairment		Equity - net		Dividend income		
	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	
	(%)		(in million Baht)												
<b><i>Direct associates</i></b>															
Global Power Synergy Plc.	23	23	14,983	14,983	5,934	5,934	8,756	8,402	-	-	8,756	8,402	426	392	
Kuraray GC Advanced Materials Co., Ltd.	33	-	1,408	-	470	-	470	-	-	-	-	-	-	-	
PTT Energy Solution Co., Ltd.	20	20	150	150	30	30	48	51	-	-	48	51	-	-	
PTT Digital Solutions Co., Ltd.	40	40	150	150	60	60	703	606	-	-	703	606	33	31	
Vinythai Plc.	25	25	7,111	7,111	3,297	3,297	5,130	4,632	-	-	5,130	4,632	266	133	
Eastern Fluid Transport Co., Ltd.	23	23	10	10	2	2	20	20	-	-	20	20	7	7	
					<u>9,793</u>	<u>9,323</u>	<u>15,127</u>	<u>13,711</u>	<u>-</u>	<u>-</u>	<u>15,127</u>	<u>13,711</u>	<u>732</u>	<u>563</u>	
<b><i>Indirect associates</i></b>															
PT. Indo Thai Trading	49	49	255	255	124	124	220	201	-	-	220	201	-	-	
Thai Eastern Top Seeds Oil Co., Ltd.	30	30	222	156	67	47	57	45	-	-	57	45	-	-	
S.P. Petpack Inter Group Co., Ltd.	25	25	200	200	50	50	46	45	-	-	46	45	-	-	
					<u>241</u>	<u>221</u>	<u>323</u>	<u>291</u>	<u>-</u>	<u>-</u>	<u>323</u>	<u>291</u>	<u>-</u>	<u>-</u>	
<b>Total - associates</b>					<u>10,034</u>	<u>9,544</u>	<u>15,450</u>	<u>14,002</u>	<u>-</u>	<u>-</u>	<u>15,450</u>	<u>14,002</u>	<u>732</u>	<u>563</u>	
<b>Total</b>					<u>35,783</u>	<u>35,293</u>	<u>46,208</u>	<u>41,579</u>	<u>-</u>	<u>-</u>	<u>46,208</u>	<u>41,579</u>	<u>2,386</u>	<u>3,848</u>	

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

	Separate financial statements													
	Ownership interest		Paid-up capital		Cost		Impairment		At cost - net		Fair value of listed securities		Dividend income	
	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017
	(%)		(in million Baht)											
<b>Joint ventures</b>														
PTT Asahi Chemical Co., Ltd.	50	50	13,819	13,819	996	996	-	-	996	996	-	-	-	-
PTT MCC Biochem Co., Ltd.	50	50	1,860	1,860	160	160	-	-	160	160	-	-	-	-
HMC Polymers Co., Ltd.	41	41	3,790	3,790	14,217	14,217	-	-	14,217	14,217	-	-	1,242	1,781
					<u>15,373</u>	<u>15,373</u>	<u>-</u>	<u>-</u>	<u>15,373</u>	<u>15,373</u>	<u>-</u>	<u>-</u>	<u>1,242</u>	<u>1,781</u>
<b>Associates</b>														
Global Power Synergy Plc.	23	23	14,983	14,983	5,934	5,934	-	-	5,934	5,934	19,923	24,521	426	392
Kuraray GC Advanced Materials Co., Ltd.	33	-	1,408	-	470	-	-	-	470	-	-	-	-	-
PTT Energy Solution Co., Ltd.	20	20	150	150	30	30	-	-	30	30	-	-	-	-
PTT Digital Solutions Co., Ltd.	40	40	150	150	60	60	-	-	60	60	-	-	33	31
Vinythai Plc.	25	25	7,111	7,111	3,297	3,297	-	-	3,297	3,297	5,921	6,128	266	133
Eastern Fluid Transport Co., Ltd.	15	15	10	10	2	2	-	-	2	2	-	-	5	5
					<u>9,793</u>	<u>9,323</u>	<u>-</u>	<u>-</u>	<u>9,793</u>	<u>9,323</u>	<u>25,844</u>	<u>30,649</u>	<u>730</u>	<u>561</u>
<b>Total</b>					<u>25,166</u>	<u>24,696</u>	<u>-</u>	<u>-</u>	<u>25,166</u>	<u>24,696</u>	<u>25,844</u>	<u>30,649</u>	<u>1,972</u>	<u>2,342</u>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

#### Joint Ventures and Associate

The following table summarises the financial information of the joint ventures and associate as included in their own financial statements, adjusted for fair value adjustments at acquisition and differences in accounting policies. The table also reconciles the summarized financial information to the carrying amount of the Group's interest in these companies.

	PTT Asahi Chemical Co., Ltd.	HMC Polymers Co., Ltd. <i>(in million Baht)</i>	Global Power Synergy Plc.
<b>For the year ended 31 December 2018</b>			
<b>Statement of income</b>			
Revenue	18,239	31,120	24,235
Profit for the year	6,028	4,002	3,359
Other comprehensive income (loss)	-	(918)	(41)
<b>Total comprehensive income for the year</b>	<b>6,028</b>	<b>3,084</b>	<b>3,318</b>

#### As at 31 December 2018

##### Statement of financial position

Current assets	6,067	9,018	12,154
Non-current assets	21,710	26,441	52,275
Current liabilities	(1,418)	(4,826)	(4,497)
Non-current liabilities	(7,220)	(6,877)	(17,363)
<b>Net assets</b>	<b>19,139</b>	<b>23,756</b>	<b>42,569</b>

#### Remark:

	PTT Asahi Chemical Co., Ltd. <i>(in million Baht)</i>	HMC Polymers Co., Ltd.
Depreciation and amortisation	924	1,640
Cash and cash equivalents	2,868	1,489

The reconciliation of the summarised financial information to the carrying amount of the Group's interest in this company.

	PTT Asahi Chemical Co., Ltd.	HMC Polymers Co., Ltd. <i>(in million Baht)</i>	Global Power Synergy Plc.
Group's interest in net assets of investee at 1 January 2018	6,555	12,848	8,402
Total comprehensive income attributable to the Group	3,014	1,278	780
Dividends received during the year	-	(1,242)	(426)
<b>Carrying amount of interest in investee at 31 December 2018</b>	<b>9,569</b>	<b>12,884</b>	<b>8,756</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

#### *Immaterial joint ventures and associates*

The summarised financial information for the Group's interest in immaterial joint ventures and associates based on the amounts reported in the Group's consolidated financial statements:

	Immaterial Joint ventures	Immaterial Associates
<b>For the year ended 31 December 2018</b>	<i>(in million Baht)</i>	
Carrying amount of interests in immaterial joint ventures and associates	8,305	6,720
Group's share of:		
- Profit for the year	1,052	923
- Other comprehensive income (loss)	7	14
- Total comprehensive income for the year	1,059	937

#### *Change in investment in joint venture and associates*

On 14 August 2018, Thai Eastern Top Seeds Oil Co., Ltd, an indirect associate of the Group, called for paid - up capital from the capital increase of 665,999 shares at Baht 29.89 per share, totalling Baht 19.91 million, of which fully received in September 2018.

At the Board of Directors' Meeting of the Company held on 18 June 2018, the Board approved to establish Kuraray GC Advanced Materials Co., Ltd. (KGC) as a joint venture company. The purpose of the joint venture company is planned to invest in production of specialty chemicals. The Company will hold 33.4% share while Kuraray Co., Ltd (KRR) and Sumitomo Corporation (SC) will hold indirect share via KRR and SC Affiliate Company by 53.3% and 13.3%, respectively. Subsequently on 19 June 2018, KGC registered the initial authorised share capital of Baht 10 million and called for paid-up capital of 33,400 shares at Baht 100 per share, totalling Baht 3.34 million. Subsequently, on 28 August 2018, KGC had called for paid - up capital from the capital increase of 4,667,650 shares at Baht 100 per share, totalling Baht 466.77 million, of which fully received in December 2018.

On 25 January 2017, Solution Creation Co., Ltd. which is a subsidiary of the Company signed a joint venture agreement with S.P. Petpack Co., Ltd. ("S.P. PETPACK"). On 23 February 2017, Solution Creation Co., Ltd. purchased the shares to hold 25% of the issued and paid capital of S.P. Petpack Inter Group Co., Ltd., a subsidiary of S.P. PETPACK, at Baht 50 million for the purpose of jointly investment expansion in building plastic packaging manufacturing plant and develop packaging market in the Republic of the Union of Myanmar. This project follows strategic direction and business strategy of the Group to expand into Cambodia-Laos-Myanmar-Vietnam ("CLMV") market.

During the year ended 31 December 2017, Thai Eastern Top Seeds Oil Company Limited which is an indirect associate of the Company has called for paid-up capital from the capital increase by the Board of Directors' Meeting held on 16 December 2016 for the purpose of working capital at Baht 45.11 per share, 665,999 shares, totalling Baht 30.04 million, of which fully received in April 2017.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 13 Other investments

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Current investments</b>				
Promissory notes - financial institutions	10,503	8,572	3,696	5,890
Available-for-sale debt securities	1,108	40	1,108	40
Available-for-sale debt securities (Private funds)	5,207	3,008	5,207	3,008
	<u>16,818</u>	<u>11,620</u>	<u>10,011</u>	<u>8,938</u>
<b>Other long - term investments</b>				
Promissory notes - financial institutions	484	-	484	-
Available-for-sale debt securities	1,369	2,555	1,369	2,555
Available-for-sale debt securities (Private funds)	4,588	6,779	4,588	6,779
Available-for-sale equity securities	362	365	362	365
Other non-marketable equity securities				
Alliance Petrochemical Investment (Singapore) Pte. Ltd. (15.34% shareholding by the Company)	-	290	-	290
Exeltium SAS (4% shareholding by the Group)	283	283	-	-
Other	60	3	3	3
	<u>7,146</u>	<u>10,275</u>	<u>6,806</u>	<u>9,992</u>
<b>Total</b>	<u><u>23,964</u></u>	<u><u>21,895</u></u>	<u><u>16,817</u></u>	<u><u>18,930</u></u>

During the third quarter of 2018, the Company completely divested all shares in Alliance Petrochemical Investment (Singapore) Pte. Ltd., in which the Company owns 15.34% to other party with the total value from the sale of shares totalling Baht 654 million. The Company has recognised gain on divestment amounting to Baht 364 million.

During the third quarter of 2016, the Company established private funds and engaged independent assets management companies for the purpose of cash balance management of the Company. Those private funds have invested in debt securities which had high liquidity and credit quality. As at 31 December 2018, the value of private funds outstanding totalling Baht 10,388 million (2017: Baht 10,229 million).

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**14 Investment properties**

	<b>Consolidated financial statements</b>		
	Land	Buildings <i>(in million Baht)</i>	Total
<b><i>Cost</i></b>			
At 1 January 2018	-	-	-
Additions	5,717	41	5,758
Reclassification to property, plant and equipment	(235)	-	(235)
<b>At 31 December 2018</b>	<b><u>5,482</u></b>	<b><u>41</u></b>	<b><u>5,523</u></b>
<b><i>Depreciation</i></b>			
At 1 January 2018	-	-	-
Depreciation charge for the year	-	(1)	(1)
<b>At 31 December 2018</b>	<b><u>-</u></b>	<b><u>(1)</u></b>	<b><u>(1)</u></b>
<b><i>Net book value</i></b>			
<b>At 1 January 2018</b>	<b><u>-</u></b>	<b><u>-</u></b>	<b><u>-</u></b>
<b>At 31 December 2018</b>	<b><u>5,482</u></b>	<b><u>40</u></b>	<b><u>5,522</u></b>

The fair value of investment properties as at 31 December 2018 of Baht 6,464 million was determined at open market values on an existing use basis and income approach. The fair value measurement for investment property has been categorised as a Level 2 and 3 fair value.

**Measurement of fair value**

*Fair value hierarchy*

The fair value of investment property was determined by external, independent property valuers, having appropriate recognised professional qualifications and recent experience in the location and category of the property being valued. The independent valuers provide the fair value of the Group's investment property portfolio on an annual basis.

*Valuation technique and significant unobservable inputs*

The fair value of investment property for land was determined by independent property valuers at open market values by scoring and weighted other different factors.

The fair value of investment property for buildings was determined by the Group at income approach. The significant unobservable inputs comprise yield rate and finance costs.

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**15 Property, plant and equipment**

		<b>Consolidated financial statements</b>						
	<i>Note</i>	Land improvement	Plant, machinery, equipment and factory tools	Buildings and buildings improvement	Furniture, fixtures and office equipment <i>(in million Baht)</i>	Vehicles	Assets under construction	Total
<b>Cost</b>								
At 1 January 2017		8,226	331,598	16,045	3,049	857	21,137	380,912
Additions		228	353	21	284	76	15,285	16,247
Transfers		655	11,640	941	71	-	(13,626)	(319)
Disposals		(17)	(4,069)	(198)	(813)	(90)	(270)	(5,457)
Effect of change in exchange rates		(18)	188	25	(12)	(1)	(577)	(395)
<b>At 31 December 2017 and</b>								
<b>1 January 2018</b>		<b>9,074</b>	<b>339,710</b>	<b>16,834</b>	<b>2,579</b>	<b>842</b>	<b>21,949</b>	<b>390,988</b>
Additions		1,864	521	123	252	54	30,227	33,041
Acquired through business acquisitions	5	1,959	7,309	205	6	-	70	9,549
Transfers		358	10,468	518	140	-	(11,160)	324
Disposals		-	(2,062)	(2)	(177)	(15)	(69)	(2,325)
Effect of change in exchange rates		(15)	(481)	(64)	(2)	-	(51)	(613)
<b>At 31 December 2018</b>		<b>13,240</b>	<b>355,465</b>	<b>17,614</b>	<b>2,798</b>	<b>881</b>	<b>40,966</b>	<b>430,964</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**Consolidated financial statements**

	Land improvement	Plant, machinery, equipment and factory tools	Buildings and buildings improvement	Furniture, fixtures and office equipment <i>(in million Baht)</i>	Vehicles	Assets under construction	Total
<b><i>Depreciation and impairment losses</i></b>							
At 1 January 2017	(740)	(144,394)	(6,504)	(2,418)	(616)	(2,248)	(156,920)
Depreciation charge for the year	(108)	(16,315)	(684)	(274)	(63)	-	(17,444)
Transfers	(157)	(613)	(16)	(2)	-	786	(2)
Disposals	13	3,609	174	810	87	-	4,693
Impairment losses	(321)	(1,169)	(36)	(7)	-	(270)	(1,803)
Effect of change in exchange rates	25	(21)	(4)	9	-	168	177
<b>At 31 December 2017 and 1 January 2018</b>	<b>(1,288)</b>	<b>(158,903)</b>	<b>(7,070)</b>	<b>(1,882)</b>	<b>(592)</b>	<b>(1,564)</b>	<b>(171,299)</b>
Depreciation charge for the year	(86)	(15,925)	(717)	(296)	(66)	-	(17,090)
Transfers	-	(7)	-	-	-	-	(7)
Disposals	-	1,287	(13)	171	13	-	1,458
Reversal of impairment losses	-	739	14	-	-	-	753
Effect of change in exchange rates	4	206	22	1	-	9	242
<b>At 31 December 2018</b>	<b>(1,370)</b>	<b>(172,603)</b>	<b>(7,764)</b>	<b>(2,006)</b>	<b>(645)</b>	<b>(1,555)</b>	<b>(185,943)</b>



**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**Consolidated financial statements**

	Land improvement	Plant, machinery, equipment and factory tools	Buildings and buildings improvement	Furniture, fixtures and office equipment <i>(in million Baht)</i>	Vehicles	Assets under construction	Total
<b>Net book value</b>							
<b>At 1 January 2017</b>							
Owned assets	7,470	187,199	9,541	443	130	18,889	223,672
Assets under finance leases	16	5	-	188	111	-	320
	<b>7,486</b>	<b>187,204</b>	<b>9,541</b>	<b>631</b>	<b>241</b>	<b>18,889</b>	<b>223,992</b>
<b>At 31 December 2017 and 1 January 2018</b>							
Owned assets	7,786	180,807	9,764	539	110	20,385	219,391
Assets under finance leases	-	-	-	158	140	-	298
	<b>7,786</b>	<b>180,807</b>	<b>9,764</b>	<b>697</b>	<b>250</b>	<b>20,385</b>	<b>219,689</b>
<b>At 31 December 2018</b>							
Owned assets	11,870	182,862	9,850	618	109	39,411	244,720
Assets under finance leases	-	-	-	174	127	-	301
	<b>11,870</b>	<b>182,862</b>	<b>9,850</b>	<b>792</b>	<b>236</b>	<b>39,411</b>	<b>245,021</b>

The gross amount of the Group's fully depreciated property and equipment that was still in use as at 31 December 2018 amounted to Baht 17,947 million. (2017: Baht 14,712 million)

*Security*

At 31 December 2018, the Group's properties with a net book value of Baht 17,069 million (2017: Baht 18,355 million) were registered to secure Bank loan (see note 20).

*Property, plant and equipment under construction*

Capitalised borrowing costs relating to the acquisition of the land and the construction of the new factory amounted to Baht 504 million (2017: Baht 141 million), with a capitalization rate of 3.38% to 5.00% (2017: 2.81% to 5.00%).

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**Separate financial statements**

	Land improvement	Plant, machinery, equipment and factory tools	Buildings and buildings improvement	Furniture, fixtures and office equipment <i>(in million Baht)</i>	Vehicles	Assets under construction	Total
<b>Cost</b>							
At 1 January 2017	6,036	263,384	9,282	2,196	548	8,957	290,403
Additions	222	332	15	147	62	8,936	9,714
Transfers	36	4,720	153	41	-	(4,976)	(26)
Disposals	(15)	(2,761)	(141)	(747)	(71)	(268)	(4,003)
<b>At 31 December 2017 and 1 January 2018</b>	<b>6,279</b>	<b>265,675</b>	<b>9,309</b>	<b>1,637</b>	<b>539</b>	<b>12,649</b>	<b>296,088</b>
Additions	291	523	28	168	21	17,420	18,451
Transfers	69	8,947	370	106	-	(9,502)	(10)
Disposals	-	(929)	(3)	(169)	(3)	(64)	(1,168)
<b>At 31 December 2018</b>	<b>6,639</b>	<b>274,216</b>	<b>9,704</b>	<b>1,742</b>	<b>557</b>	<b>20,503</b>	<b>313,361</b>
<b>Depreciation</b>							
At 1 January 2017	(493)	(113,894)	(3,666)	(1,768)	(415)	-	(120,236)
Depreciation charge for the year	(56)	(12,295)	(381)	(175)	(35)	-	(12,942)
Disposals	12	2,409	119	747	71	-	3,358
Impairment loss	-	-	-	-	-	(270)	(270)
<b>At 31 December 2017 and 1 January 2018</b>	<b>(537)</b>	<b>(123,780)</b>	<b>(3,928)</b>	<b>(1,196)</b>	<b>(379)</b>	<b>(270)</b>	<b>(130,090)</b>
Depreciation charge for the year	(59)	(12,002)	(398)	(199)	(38)	-	(12,696)
Disposals	-	907	3	163	3	-	1,076
<b>At 31 December 2018</b>	<b>(596)</b>	<b>(134,875)</b>	<b>(4,323)</b>	<b>(1,232)</b>	<b>(414)</b>	<b>(270)</b>	<b>(141,710)</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

	<b>Separate financial statements</b>						Total
	Land improvement	Plant, machinery, equipment and factory tools	Buildings and buildings improvement	Furniture, fixtures and office equipment <i>(in million Baht)</i>	Vehicles	Assets under construction	
<b><i>Net book value</i></b>							
<b>At 1 January 2017</b>							
Owned assets	5,543	149,490	5,616	280	75	8,957	169,961
Assets under finance leases	-	-	-	148	58	-	206
	<b>5,543</b>	<b>149,490</b>	<b>5,616</b>	<b>428</b>	<b>133</b>	<b>8,957</b>	<b>170,167</b>
<b>At 31 December 2017 and 1 January 2018</b>							
Owned assets	5,742	141,895	5,381	318	67	12,379	165,782
Assets under finance leases	-	-	-	123	93	-	216
	<b>5,742</b>	<b>141,895</b>	<b>5,381</b>	<b>441</b>	<b>160</b>	<b>12,379</b>	<b>165,998</b>
<b>At 31 December 2018</b>							
Owned assets	6,043	139,341	5,381	371	63	20,233	171,432
Assets under finance leases	-	-	-	139	80	-	219
	<b>6,043</b>	<b>139,341</b>	<b>5,381</b>	<b>510</b>	<b>143</b>	<b>20,233</b>	<b>171,651</b>

The gross amount of the Company's fully depreciated property and equipment that was still in use as at 31 December 2018 amounted to Baht 11,079 million (2017: Baht 9,131 million).

*Property, plant and equipment under construction*

Capitalised borrowing costs relating to the acquisition of the land and the construction of the new factory amounted to Baht 192 million (2017: Baht 119 million), with a capitalisation rate of 5% (2017: 5%).

**PTT Global Chemical Public Company Limited and its Subsidiaries**

**Notes to the financial statements**

**For the year ended 31 December 2018**

**16 Land leasehold right**

	<b>Consolidated financial statements</b>	<b>Separate financial statements</b>
	<i>(in million Baht)</i>	
<b>Cost</b>		
At 1 January 2017	1,131	1,130
<b>At 31 December 2017 and 1 January 2018</b>	<b>1,131</b>	<b>1,130</b>
<b>At 31 December 2018</b>	<b>1,131</b>	<b>1,130</b>
<b>Amortisation</b>		
At 1 January 2017	(769)	(768)
Amortisation charge for the year	(38)	(38)
<b>At 31 December 2017 and 1 January 2018</b>	<b>(807)</b>	<b>(806)</b>
Amortisation charge for the year	(90)	(90)
<b>At 31 December 2018</b>	<b>(897)</b>	<b>(896)</b>
<b>Net book value</b>		
At 1 January 2017	362	362
<b>At 31 December 2017 and 1 January 2018</b>	<b>324</b>	<b>324</b>
<b>At 31 December 2018</b>	<b>234</b>	<b>234</b>

**17 Goodwill**

	<b>Consolidated financial statements</b>
	<i>(in million Baht)</i>
<b>Cost</b>	
At 1 January 2017	1,648
<b>At 31 December 2017 and 1 January 2018</b>	<b>1,648</b>
<b>At 31 December 2018</b>	<b>1,648</b>
<b>Impairment losses</b>	
At 1 January 2017	(717)
<b>At 31 December 2017 and 1 January 2018</b>	<b>(717)</b>
<b>At 31 December 2018</b>	<b>(717)</b>
<b>Net book value</b>	
At 1 January 2017	931
<b>At 31 December 2017 and 1 January 2018</b>	<b>931</b>
<b>At 31 December 2018</b>	<b>931</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**18 Intangible assets**

<b>Consolidated financial statements</b>								
	<i>Note</i>	Production licence fees	Computer software	Customer contracts and the related customer relationships	Right to use pipe rack <i>(in million Baht)</i>	Right to use - others	Intangible in progress	Total
<b>Cost</b>								
At 1 January 2017		5,973	4,025	162	508	2,719	927	14,314
Additions		7	33	-	-	37	689	766
Transfers		-	207	-	-	66	(281)	(8)
Disposals		-	(56)	-	-	(11)	-	(67)
Effect of change in exchange rates		-	1	(13)	-	(68)	2	(78)
<b>At 31 December 2017 and 1 January 2018</b>		<b>5,980</b>	<b>4,210</b>	<b>149</b>	<b>508</b>	<b>2,743</b>	<b>1,337</b>	<b>14,927</b>
Additions		23	58	-	15	6	921	1,023
Acquired through business acquisitions	5	-	5	-	-	3	-	8
Transfers		1,162	348	-	7	5	(1,520)	2
Disposals		-	(7)	-	-	(191)	-	(198)
Effect of change in exchange rates		-	(5)	(1)	-	(63)	(2)	(71)
<b>At 31 December 2018</b>		<b>7,165</b>	<b>4,609</b>	<b>148</b>	<b>530</b>	<b>2,503</b>	<b>736</b>	<b>15,691</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

	<b>Consolidated financial statements</b>						
	Production licence fees	Computer software	Customer contracts and the related customer relationships	Right to use pipe rack <i>(in million Baht)</i>	Right to use - others	Intangible in progress	Total
<i><b>Amortisation and impairment losses</b></i>							
At 1 January 2017	(2,153)	(2,133)	(128)	(325)	(1,304)	-	(6,043)
Amortisation charge for the year	(202)	(296)	(12)	(33)	(210)	-	(753)
Transfers	-	2	-	-	-	-	2
Disposals	-	56	-	-	8	-	64
Impairment losses	-	-	-	-	(471)	(22)	(493)
Effect of change in exchange rates	-	(1)	10	-	55	-	64
<b>At 31 December 2017</b>	<b>(2,355)</b>	<b>(2,372)</b>	<b>(130)</b>	<b>(358)</b>	<b>(1,922)</b>	<b>(22)</b>	<b>(7,159)</b>
<b>and 1 January 2018</b>	<b>(2,355)</b>	<b>(2,372)</b>	<b>(130)</b>	<b>(358)</b>	<b>(1,922)</b>	<b>(22)</b>	<b>(7,159)</b>
Amortisation charge for the year	(243)	(308)	(12)	(29)	(127)	-	(719)
Disposals	-	7	-	-	105	-	112
Reversal of impairment losses	-	-	-	-	86	-	86
Effect of change in exchange rates	-	5	2	-	37	-	44
<b>At 31 December 2018</b>	<b>(2,598)</b>	<b>(2,668)</b>	<b>(140)</b>	<b>(387)</b>	<b>(1,821)</b>	<b>(22)</b>	<b>(7,636)</b>
<i><b>Net book value</b></i>							
At 1 January 2017	<b>3,820</b>	<b>1,892</b>	<b>34</b>	<b>183</b>	<b>1,415</b>	<b>927</b>	<b>8,271</b>
At 31 December 2017 and 1 January 2018	<b>3,625</b>	<b>1,838</b>	<b>19</b>	<b>150</b>	<b>821</b>	<b>1,315</b>	<b>7,768</b>
At 31 December 2018	<b>4,567</b>	<b>1,941</b>	<b>8</b>	<b>143</b>	<b>682</b>	<b>714</b>	<b>8,055</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

	Production licence fees	Computer software	Separate financial statements		Intangible in progress	Total
			Right to use pipe rack <i>(in million Baht)</i>	Right to use - others		
<b>Cost</b>						
At 1 January 2017	4,113	3,167	415	-	823	8,518
Additions	7	26	-	-	473	506
Transfers	-	150	-	-	(150)	-
Disposals	-	(55)	-	-	-	(55)
<b>At 31 December 2017 and 1 January 2018</b>	<b>4,120</b>	<b>3,288</b>	<b>415</b>	<b>-</b>	<b>1,146</b>	<b>8,969</b>
Additions	10	22	15	-	730	777
Transfers	1,162	305	4	-	(1,471)	-
Disposals	-	(6)	-	-	-	(6)
<b>At 31 December 2018</b>	<b>5,292</b>	<b>3,609</b>	<b>434</b>	<b>-</b>	<b>405</b>	<b>9,740</b>
<b>Amortisation</b>						
At 1 January 2017	(1,495)	(1,542)	(248)	-	-	(3,285)
Amortisation charge for the year	(149)	(247)	(30)	-	-	(426)
Disposals	-	55	-	-	-	55
Impairment loss	-	-	-	-	(22)	(22)
<b>At 31 December 2017 and 1 January 2018</b>	<b>(1,644)</b>	<b>(1,734)</b>	<b>(278)</b>	<b>-</b>	<b>(22)</b>	<b>(3,678)</b>
Amortisation charge for the year	(189)	(248)	(27)	-	-	(464)
Disposals	-	6	-	-	-	6
<b>At 31 December 2018</b>	<b>(1,833)</b>	<b>(1,976)</b>	<b>(305)</b>	<b>-</b>	<b>(22)</b>	<b>(4,136)</b>
<b>Net book value</b>						
At 1 January 2017	<b>2,618</b>	<b>1,625</b>	<b>167</b>	<b>-</b>	<b>823</b>	<b>5,233</b>
At 31 December 2017 and 1 January 2018	<b>2,476</b>	<b>1,554</b>	<b>137</b>	<b>-</b>	<b>1,124</b>	<b>5,291</b>
At 31 December 2018	<b>3,459</b>	<b>1,633</b>	<b>129</b>	<b>-</b>	<b>383</b>	<b>5,604</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 19 Deferred tax

Deferred tax assets and liabilities as at 31 December were as follows:

	Consolidated financial statements			
	Assets		Liabilities	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Total	2,232	1,371	(3,808)	(2,902)
Set off of tax	(1,061)	(1,062)	1,061	1,062
<b>Net deferred tax assets (liabilities)</b>	<b>1,171</b>	<b>309</b>	<b>(2,747)</b>	<b>(1,840)</b>

	Separate financial statements			
	Assets		Liabilities	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Total	951	957	(2,740)	(2,568)
Set off of tax	(951)	(957)	951	957
<b>Net deferred tax liabilities</b>	<b>-</b>	<b>-</b>	<b>(1,789)</b>	<b>(1,611)</b>

Movements in total deferred tax assets and liabilities during the year were as follows:

	Consolidated financial statements					At 31 December 2018
	At 1 January 2018	(Charged) / credited to:			Acquisition of businesses (note 5)	
		Profit and loss (note 32)	Other comprehensive income	Exchange differences		
	<i>(in million Baht)</i>					
<b>Deferred tax assets</b>						
Inventories	10	1	-	-	1	12
Employee benefit expenses	688	18	-	-	19	725
Capital distribution from subsidiaries	22	(22)	-	-	-	-
Loss carry forward	41	650	-	(1)	158	848
Others	610	18	-	-	19	647
<b>Total</b>	<b>1,371</b>	<b>665</b>	<b>-</b>	<b>(1)</b>	<b>197</b>	<b>2,232</b>
<b>Deferred tax liabilities</b>						
Property, plant and equipment	(2,847)	146	-	9	(777)	(3,469)
Finance lease assets	(7)	1	-	-	-	(6)
Others	(48)	(268)	(13)	-	(4)	(333)
<b>Total</b>	<b>(2,902)</b>	<b>(121)</b>	<b>(13)</b>	<b>9</b>	<b>(781)</b>	<b>(3,808)</b>
<b>Net</b>	<b>(1,531)</b>	<b>544</b>	<b>(13)</b>	<b>8</b>	<b>(584)</b>	<b>(1,576)</b>



# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	<b>Consolidated financial statements</b>				<b>At 31 December 2017</b>
	<b>At 1 January 2017</b>	<b>(Charged) / credited to:</b>			
		Profit and loss <i>(note 32)</i>	Other comprehensive income <i>(in million Baht)</i>	Exchange differences	
<b><i>Deferred tax assets</i></b>					
Inventories	-	10	-	-	10
Employee benefit expenses	505	100	83	-	688
Capital distribution from subsidiaries	386	(364)	-	-	22
Others	650	7	-	(6)	651
<b>Total</b>	<b>1,541</b>	<b>(247)</b>	<b>83</b>	<b>(6)</b>	<b>1,371</b>
<b><i>Deferred tax liabilities</i></b>					
Property, plant and equipment	(3,029)	188	-	(6)	(2,847)
Finance lease assets	(6)	(1)	-	-	(7)
Others	(425)	366	-	11	(48)
<b>Total</b>	<b>(3,460)</b>	<b>553</b>	<b>-</b>	<b>5</b>	<b>(2,902)</b>
<b>Net</b>	<b>(1,919)</b>	<b>306</b>	<b>83</b>	<b>(1)</b>	<b>(1,531)</b>

	<b>Separate financial statements</b>				<b>At 31 December 2018</b>
	<b>At 1 January 2018</b>	<b>(Charged) / credited to:</b>			
		Profit and loss <i>(note 32)</i>	Other comprehensive income <i>(in million Baht)</i>	Exchange differences	
<b><i>Deferred tax assets</i></b>					
Inventories	10	1	-	-	11
Employee benefit expenses	573	11	-	-	584
Capital distribution from subsidiaries	22	(22)	-	-	-
Others	352	4	-	-	356
<b>Total</b>	<b>957</b>	<b>(6)</b>	<b>-</b>	<b>-</b>	<b>951</b>
<b><i>Deferred tax liabilities</i></b>					
Inventories	(1)	(243)	-	-	(244)
Property, plant and equipment	(2,530)	98	-	-	(2,432)
Finance lease assets	(5)	-	-	-	(5)
Others	(32)	(14)	(13)	-	(59)
<b>Total</b>	<b>(2,568)</b>	<b>(159)</b>	<b>(13)</b>	<b>-</b>	<b>(2,740)</b>
<b>Net</b>	<b>(1,611)</b>	<b>(165)</b>	<b>(13)</b>	<b>-</b>	<b>(1,789)</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	Separate financial statements (Charged) / credited to:			At 31 December 2017
	At 1 January 2017	Profit and loss (note 32) (in million Baht)	Other comprehensive income	
<b>Deferred tax assets</b>				
Inventories	-	10	-	10
Employee benefit expenses	420	82	71	573
Capital distribution from subsidiaries	386	(364)	-	22
Others	328	24	-	352
<b>Total</b>	<b>1,134</b>	<b>(248)</b>	<b>71</b>	<b>957</b>
<b>Deferred tax liabilities</b>				
Inventories	(1)	-	-	(1)
Property, plant and equipment	(2,705)	175	-	(2,530)
Finance lease assets	(4)	(1)	-	(5)
Compensation for damage of assets	(231)	231	-	-
Others	-	(32)	-	(32)
<b>Total</b>	<b>(2,941)</b>	<b>373</b>	<b>-</b>	<b>(2,568)</b>
<b>Net</b>	<b>(1,807)</b>	<b>125</b>	<b>71</b>	<b>(1,611)</b>

In the fourth quarter of 2018, the Group recognised deferred tax assets of previously unrecognised tax losses because management considered it probable that future taxable profits would be available against which such losses can be used.

## 20 Interest-bearing liabilities

Interest bearing liabilities are defined as loans, debentures and finance lease liabilities which are as follows;

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
(in million Baht)					
<b>Current</b>					
Short-term loans from financial institutions					
secured		388	-	-	-
unsecured		2,955	263	-	-
Short-term loans from related parties					
unsecured	6	-	-	1,931	2,558
<b>Short-term loans</b>		<b>3,343</b>	<b>263</b>	<b>1,931</b>	<b>2,558</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Current (Continue)</b>				
Current portion of long-term loans from financial institutions				
secured	883	1,290	-	-
unsecured	6,164	8,003	4,306	6,835
Current portion of long-term loans from other parties				
secured	894	642	-	-
unsecured	34	27	-	-
Current portion of debentures				
unsecured	1,942	-	1,942	-
<b>Current portion of long-term loans</b>	<b>9,917</b>	<b>9,962</b>	<b>6,248</b>	<b>6,835</b>
Current portion of financial lease liabilities	138	138	93	103
<b>Total current</b>	<b>13,398</b>	<b>10,363</b>	<b>8,272</b>	<b>9,496</b>
<b>Non-current</b>				
Long-term loans from financial institutions				
secured	13,648	8,103	-	-
unsecured	17,267	23,718	10,113	14,423
Long-term loans from related party				
unsecured	-	-	16,105	-
Long-term loans from other parties				
secured	-	876	-	-
unsecured	324	246	-	-
Debentures				
unsecured	52,408	54,645	36,379	54,645
<b>Long-term loans</b>	<b>83,647</b>	<b>87,588</b>	<b>62,597</b>	<b>69,068</b>
Finance lease liabilities	181	175	133	118
<b>Total non-current</b>	<b>83,828</b>	<b>87,763</b>	<b>62,730</b>	<b>69,186</b>
<b>Total</b>	<b>97,226</b>	<b>98,126</b>	<b>71,002</b>	<b>78,682</b>

As at 31 December 2018, the Group had unutilised credit facilities totalling Baht 19,072 million (2017: Baht 22,595 million).

The periods to maturity of interest-bearing liabilities, excluding finance lease liabilities, as at 31 December were as follows:

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Within one year	13,260	10,225	8,179	9,393
After one year but within five years	74,624	78,761	62,597	66,073
After five years	9,023	8,827	-	2,995
<b>Total</b>	<b>96,907</b>	<b>97,813</b>	<b>70,776</b>	<b>78,461</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

### For the year ended 31 December 2018

Long-term loans as at 31 December were secured on the following assets;

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
		<i>(in million Baht)</i>		
Property, plant and equipment	17,962	18,355	-	-

Debentures and Loans from financial institutions of the Group were as follow;

#### Debentures

On 28 June 2018, the Company repurchased its existing US dollar debenture and paid for the repurchase of such debenture in a total amount of USD 495.89 million or equivalent to Baht 16,453 million and GC Treasury Center Company Limited, a subsidiary, issues a new debenture with on-par terms and conditions of the existing debenture (Par-for-Par Tender Offer). The Company is the guarantor of the subsidiary's liability in the amount not exceeding 125% of the outstanding debenture. The repurchase of the debenture is for the purpose of financial service management for the Group.

As at 31 December 2018, the Company had unsubordinated and unsecured debentures in US dollar and Thai Baht in the amount of Baht 54,350 million (2017: Baht 54,645 million). These debentures have maturity periods between 4 years to 10 years, bear different interest rates and repayment schedules as specified in each agreement.

Details of the Company's debentures as at 31 December 2018 were as follows:

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (%) p.a.	Repayment Terms
<b>The Company</b>						
Unsubordinated debenture unsecured with a debenture holders' representative	Baht	1,942	1,000	10	5.50	Interest is payable on a semi-annual basis and maturity in June 2019.
Unsubordinated debenture at 99.108% of the face value unsecured with a debenture holders' representative	USD	504.11	1,000	10	4.25	Interest is payable on a semi-annual basis and maturity in September 2022.
Unsubordinated debenture unsecured with a debenture holders' representative	Baht	10,000	1,000	7	4.50	Interest is payable on a semi-annual basis and maturity in August 2021.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	Currency	Facilities (in million)	Face value per share	Years	Interest rates (%) p.a.	Repayment Terms
Unsubordinated debenture unsecured with a debenture holders' representative and debenture issuer has rights to redeem the debentures prior to maturity after one year of issuance	Baht	10,000	1,000	4	3.05	Interest is payable on a semi-annual basis and maturity in August 2021.

### Subsidiaries

Unsubordinated debenture at 100.00% of the face value unsecured with a debenture holders' representative	USD	495.89	1,000	4.2	4.25	Interest is payable on a semi-annual basis and maturity in September 2022.
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### Loans from financial institutions

As at 31 December 2018, the Group and the Company had long-term and revolving long-term credit facility agreements with several financial institutions totalling Baht 37,962 million and Baht 14,419 million, respectively (2017: Baht 41,114 million and Baht 21,258 million, respectively) bear different interest rates as specified in each agreement. The Group is required to comply with certain covenants pertaining to maintenance of certain financial ratios, percentage of share held by the major shareholder and other conditions as specified in each agreement.

Details of the Group's loans as at 31 December 2018 were as follows:

Currency	Facilities (in million)	Interest Rates (%) p.a.	Repayment Terms
Baht	3,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from July 2015.

### The Company

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

Currency	Facilities (in million)	Interest Rates (%) p.a.	Repayment Terms
<b>The Company (continue)</b>			
Baht	7,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 15 instalments commencing from September 2013.
USD	100	LIBOR 6M plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from March 2016.
Baht	3,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from March 2014.
Baht	6,000	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 10 instalments commencing from March 2016.
Baht	5,000	THBFIX 6M plus margin	Principal is repayable in 2 instalments in December 2020 and June 2023
<b>Subsidiaries</b>			
EUR	190	EURIBOR 3 M plus a margin	Principal is repayable on an annual basis, in 6 instalments commencing from 2017.
Baht	1,000	Fixed rate	Principal is repayable on a quarterly basis, in 16 instalments commencing from September 2016.
Baht	700	BIBOR 3 M plus a margin	Principal is repayable on a quarterly basis, in 20 instalments, commencing from March 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from April 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 14 instalments commencing from May 2016.
Baht	900	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 12 instalments commencing from May 2017.
Baht	750	Fixed rate	Principal is repayable on a semi-annual basis, in 20 instalments commencing from May 2018.

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

Currency	Facilities (in million)	Interest Rates (%) p.a.	Repayment Terms
<b>Subsidiaries (continue)</b>			
Baht	750	Fixed rate	Principal is repayable on a semi-annual basis, in 20 instalments commencing from May 2018.
Baht	8,653.87	Highest interest rate for 6 month-fixed deposit plus margin	Principal is repayable on a semi-annual basis, in 17 instalments commencing from September 2018.
Baht	500	Fixed rate	Principal is repayable on a quarterly basis, in 33 instalments commencing from June 2019.
Baht	575	BIBOR 3 M plus a margin	Principal is repayable on a quarterly basis, in 13 instalments commencing from September 2019.
Baht	14,357	THBFIX 3 M plus a margin	Principal is repayable on a semi-annual basis, in 24 instalments commencing from February 2021.
Baht	6,004	THBFIX 3 M plus a margin	Principal is repayable on a semi-annual basis, in 20 instalments commencing from February 2021.

**21 Trade accounts payable**

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
Related parties	6	28,167	26,785	26,147	25,386
Other parties		6,349	4,352	1,313	1,065
<b>Total</b>		<b>34,516</b>	<b>31,137</b>	<b>27,460</b>	<b>26,451</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**22 Other payables**

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Accrued operating expenses	2,912	2,884	2,120	2,084
Accrued interest expenses	706	727	715	698
Other account payables	5,193	5,056	4,331	4,707
Deposits and advances received	1,979	435	198	149
Retention payables	49	42	24	14
Current portion of finance lease liabilities	138	138	93	103
Withholding tax payable	451	347	259	233
Accrued other tax expenses	4,005	3,438	3,967	3,343
Others	435	456	6	5
<b>Total</b>	<b>15,868</b>	<b>13,523</b>	<b>11,713</b>	<b>11,336</b>

**23 Non-current provisions for employee benefits**

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Statement of financial position</b>				
<b>Non-current provisions for:</b>				
Post-employee benefits	3,585	3,467	2,545	2,366
Other long-term employee benefits	698	544	470	466
<b>Total</b>	<b>4,283</b>	<b>4,011</b>	<b>3,015</b>	<b>2,832</b>

Movement in the present value of the defined benefit obligations:

	<b>Consolidated financial statements</b>		<b>Separate financial statements</b>	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
At 1 January	4,011	3,144	2,832	2,113
<b>Include in profit or loss:</b>				
Current service costs	294	226	192	137
Interest on obligation	102	105	80	86
Actuarial (gain) loss	(12)	152	-	124
	384	483	272	347
<b>Included in other comprehensive income</b>				
Actuarial (gain) loss	(20)	543	-	456
Currency translation differences	(32)	22	-	-
	(52)	565	-	456



# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	Consolidated financial statements		Separate financial statements	
<b>Others</b>				
Benefits paid by the plan	(150)	(181)	(89)	(84)
Defined benefit obligations from acquisition of business	90	-	-	-
	<u>(60)</u>	<u>(181)</u>	<u>(89)</u>	<u>(84)</u>
<b>At 31 December</b>	<b><u>4,283</u></b>	<b><u>4,011</u></b>	<b><u>3,015</u></b>	<b><u>2,832</u></b>

(Gains) losses recognised in other comprehensive income arising from:

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Demographic assumptions	-	38	-	49
Financial assumptions	(19)	350	-	325
Experience adjustment	(1)	155	-	82
<b>Total</b>	<b><u>(20)</u></b>	<b><u>543</u></b>	<b><u>-</u></b>	<b><u>456</u></b>

	Consolidated financial statements		Separate financial statements	
Year ended 31 December	2018	2017	2018	2017
	<i>(in million Baht)</i>			

### Statement of comprehensive income:

#### Recognised in profit or loss:

Post-employee benefits	326	272	226	184
Other long-term employee benefits	58	211	46	163
<b>Total</b>	<b><u>384</u></b>	<b><u>483</u></b>	<b><u>272</u></b>	<b><u>347</u></b>

#### Recognised in other comprehensive income:

Actuarial (gains) losses recognised during the year	(20)	543	-	456
Cumulative actuarial losses recognised	<u>1,043</u>	<u>1,051</u>	<u>824</u>	<u>824</u>

The expense is recognised in the following line items in the statement of income:

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Cost of sales	244	192	167	122
Selling and distribution and administrative expenses	140	291	105	225
<b>Total</b>	<b><u>384</u></b>	<b><u>483</u></b>	<b><u>272</u></b>	<b><u>347</u></b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### *Actuarial assumptions*

The following were the principal actuarial assumptions at the reporting date (expressed as weighted averages).

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
Discount rate	1.8-3.5	1.4-2.9	2.9	2.9
Future salary growth	1.5-8	2.5-7	7	7
Employee turnover	0-50	0-50	0-3	0-3
Retirement age	55-65 years	55-65 years	60 years	60 years

Assumptions regarding future mortality have been based on published statistics and mortality tables.

At 31 December 2018, the weighted-average duration of the defined benefit obligation was 18 years (2017: 18 years).

### *Sensitivity analysis*

Reasonably possible changes at the reporting date to one of the relevant actuarial assumptions, holding other assumptions constant, would have affected the defined benefit obligation by the amounts shown below;

	Consolidated financial statements		Separate financial statements	
	Increase	Decrease	Increase	Decrease
	<i>(in million Baht)</i>			
<b>At 31 December 2018</b>				
Discount rate (1% movement)	(425)	503	(308)	363
Future salary growth (1% movement)	433	(358)	299	(259)
<b>At 31 December 2017</b>				
Discount rate (1% movement)	(411)	485	(288)	340
Future salary growth (1% movement)	410	(353)	278	(241)

Although the analysis does not take account of the full distribution of cash flows expected under the plan, it does provide an approximation of the sensitivity of the assumptions shown.

On December 13, 2018, the National Legislative Assembly passed a resolution approving the draft of a new Labor Protection Act, which is in the process being published in the Royal Gazette. The new Labor Protection Act stipulates additional legal severance pay rate for employees who have worked for an uninterrupted period of twenty years or more. Such employees are entitled to receive compensation at a rate of not less than that of 400 days. This change is considered a post-employment benefits plan amendment and the Group have additional liabilities for long-term employee benefits in the consolidated and separate financial statements approximately Baht 954 million and Baht 796 million, respectively (owners of the parent net of tax approximately Baht 760 million and Baht 646 million, respectively). The Group will reflect the effect of this change by recognizing past service cost as expenses in the income statement of the period in which the law is effective.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 24 Share capital

	Par value per share (Baht)	2018		2017	
		Number	Amount (million shares / million Baht)	Number	Amount
<b><i>Authorised</i></b>					
At 1 January					
ordinary shares	10	4,508.8	45,088.5	4,508.8	45,088.5
<b>At 31 December</b>					
<b>ordinary shares</b>	10	<b>4,508.8</b>	<b>45,088.5</b>	<b>4,508.8</b>	<b>45,088.5</b>
<b><i>Issued and paid-up</i></b>					
At 1 January					
ordinary shares	10	4,508.8	45,088.5	4,508.8	45,088.5
<b>At 31 December</b>					
<b>ordinary shares</b>	10	<b>4,508.8</b>	<b>45,088.5</b>	<b>4,508.8</b>	<b>45,088.5</b>

### 25 Additional paid-in capital and reserves

#### *Share premium*

Section 51 of the Public Companies Act B.E. 2535 requires companies to set aside share subscription monies received in excess of the par value of the shares issued to a reserve account (“share premium”). Share premium is not available for dividend distribution.

#### *Surplus on treasury shares*

The surplus on treasury shares represents the accumulated surplus on sale of treasury shares, net of any deficits on sale or cancellation of treasury shares. The surplus on treasury shares is not available for dividend distribution.

#### *Difference arising from business combination under common control*

Difference on common control transactions arising within equity represents the difference of the book values of certain entities or businesses under common control under their cost as of the date of their acquisition. The reserve is non-distributable and will be retained until the respective businesses are sold or otherwise disposed of.

#### *Legal reserve*

Section 116 of the Public Companies Act B.E. 2535 requires that a company shall allocate not less than 5% of its annual net profit, less any accumulated losses brought forward (if any), to a reserve account (“legal reserve”), until this account reaches an amount not less than 10% of the registered authorised capital. The legal reserve is not available for dividend distribution.

#### *Treasury shares reserve*

The treasury shares reserve represents the amount appropriated from retained earnings equal to the cost of the Company’s own shares held by the Company. The treasury shares reserve is not available for dividend distribution.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### *Other components of equity*

#### *Currency translation differences*

The currency translation differences account within equity comprises all foreign currency differences arising from the translation of the financial statements of foreign operations, as well as from the translation of liabilities that hedge the Company's net investment in a foreign operation.

#### *Fair value changes in available-for-sale investments*

The fair value changes in available-for-sale investments account within equity comprises the cumulative net change in the fair value of available-for-sale investments until the investments are derecognised or impaired.

#### *Cash flow hedges*

The cash flow hedges account within equity comprises the cumulative net change in the fair value of cash flow hedges related to hedged transactions that have not yet occurred for effective portion.

#### *Movements in reserves*

Movements in reserves are shown in the statements of changes in equity.

## **26 Segment information**

The Group has significant business segments which offer different products and services, and are managed separately. For each of the business segments, the chief operating decision maker (CODM) reviews internal management reports on at least a quarterly basis. The operations in each of the Group's reportable segments have 7 reportable segments. The Group has reviewed business segments and resulted in changes in reportable segments as follows;

Segment 1	Refinery
Segment 2	Aromatics
Segment 3	Olefins and Derivatives
Segment 4	Green Chemicals
Segment 5	Performance Materials and Chemicals
Segment 6	Service and Others
Segment 7	Investments in Other Joint Ventures and Associates

Performance information of each reportable segment is measured based on segment profit before interest expense, tax, depreciation and amortisation which is included in the internal management reports that are reviewed by the Group's CODM. Management believes that using profit before interest expense, tax, depreciation and amortisation to measure performance is the most relevant in evaluating the results of certain segments relative to other entities that operate within these industries.

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**Information about reporting segments for the year ended 31 December 2018**

	Refinery	Aromatics	Olefins and Derivatives	Green Chemicals	Performance Materials and Chemicals	Service and Others	Investments in Other Joint Ventures and Associates	Elimination	Total
	<i>(in million Baht)</i>								
External revenues	227,034	92,601	135,126	15,233	46,751	1,910	-	-	518,655
Inter-segment revenues	23,877	53,968	13,134	984	135	3,984	-	(96,082)	-
<b>Total revenues</b>	<b>250,911</b>	<b>146,569</b>	<b>148,260</b>	<b>16,217</b>	<b>46,886</b>	<b>5,894</b>	<b>-</b>	<b>(96,082)</b>	<b>518,655</b>
Cost of sales and rendering of services	(242,617)	(138,697)	(106,392)	(14,618)	(37,677)	(3,969)	-	96,013	(447,957)
Selling and distribution and administrative expenses	(786)	(1,656)	(7,173)	(835)	(2,362)	(2,184)	-	1,352	(13,644)
<b>Profit before interest expense, tax, depreciation and amortisation</b>	<b>7,960</b>	<b>5,750</b>	<b>35,137</b>	<b>859</b>	<b>6,998</b>	<b>1,303</b>	<b>-</b>	<b>256</b>	<b>58,263</b>
Interest income	178	159	462	54	59	322	-	(58)	1,176
Finance costs	(382)	(126)	(642)	(233)	(465)	(1,824)	-	79	(3,593)
Depreciation and amortisation	(3,592)	(3,343)	(8,538)	(529)	(2,925)	(552)	-	199	(19,280)
Expenses from raw materials derogation	-	-	-	(2,004)	-	-	-	-	(2,004)
Gain on bargain purchase	-	-	1,355	-	-	-	-	-	1,355
Dividend income	-	-	-	25	-	4,214	-	(4,202)	37
Share of profit of investments in joint ventures	-	-	-	118	-	-	5,091	-	5,209
Share of profit (loss) of investments in associates	-	-	4	(8)	-	-	1,672	18	1,686
Others	12	120	369	22	200	(318)	-	3	408
<b>Profit (loss) before income tax</b>	<b>4,176</b>	<b>2,560</b>	<b>28,147</b>	<b>(1,696)</b>	<b>3,867</b>	<b>3,145</b>	<b>6,763</b>	<b>(3,705)</b>	<b>43,257</b>
<b>Profit (loss) for reportable segment - owner of the parent</b>	<b>4,031</b>	<b>2,269</b>	<b>25,118</b>	<b>(1,056)</b>	<b>4,173</b>	<b>2,467</b>	<b>6,763</b>	<b>(3,696)</b>	<b>40,069</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**Information about reporting segments for the year ended 31 December 2017**

	Refinery	Aromatics	Olefins and Derivatives	Green Chemicals	Performance Materials and Chemicals	Service and Others	Investments in Other Joint Ventures and Associates	Elimination	Total
	<i>(in million Baht)</i>								
External revenues	187,424	65,195	127,874	18,195	39,198	2,035	-	-	439,921
Inter-segment revenues	17,561	44,687	19,242	1,196	124	3,828	-	(86,638)	-
<b>Total revenues</b>	<b>204,985</b>	<b>109,882</b>	<b>147,116</b>	<b>19,391</b>	<b>39,322</b>	<b>5,863</b>	<b>-</b>	<b>(86,638)</b>	<b>439,921</b>
Cost of sales and rendering of services	(190,434)	(99,383)	(106,412)	(17,608)	(34,167)	(4,090)	-	88,089	(364,005)
Selling and distribution and administrative expenses	(642)	(1,462)	(6,451)	(869)	(2,314)	(1,899)	-	1,258	(12,379)
<b>Profit before interest expense, tax, depreciation and amortisation</b>	<b>12,450</b>	<b>9,176</b>	<b>34,983</b>	<b>996</b>	<b>3,368</b>	<b>742</b>	<b>-</b>	<b>1,765</b>	<b>63,480</b>
Interest income	167	108	480	36	34	167	-	(49)	943
Finance costs	(485)	(154)	(743)	(196)	(613)	(1,793)	-	49	(3,935)
Depreciation and amortisation	(3,646)	(3,968)	(8,440)	(855)	(2,850)	(522)	-	197	(20,084)
Loss from impairment of assets	-	(25)	(267)	(2,004)	-	-	-	-	(2,296)
Dividend income	-	-	-	-	-	5,585	-	(5,582)	3
Share of profit of investments in joint ventures	-	-	-	88	-	-	4,015	8	4,111
Share of profit (loss) of investments in associates	-	-	(5)	(1)	-	-	1,476	(9)	1,461
Others	(204)	124	442	(99)	(78)	2,505	-	(390)	2,300
<b>Profit (loss) before income tax</b>	<b>8,282</b>	<b>5,261</b>	<b>26,450</b>	<b>(2,035)</b>	<b>(139)</b>	<b>6,684</b>	<b>5,491</b>	<b>(4,011)</b>	<b>45,983</b>
<b>Profit (loss) for reportable segment - owner of the parent</b>	<b>7,026</b>	<b>4,696</b>	<b>24,328</b>	<b>(1,933)</b>	<b>(47)</b>	<b>5,996</b>	<b>3,277</b>	<b>(4,045)</b>	<b>39,298</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**

**Notes to the financial statements**

**For the year ended 31 December 2018**

	Refinery	Aromatics	Olefins and Derivatives	Green Chemicals	Performance Materials and Chemicals	Service and Others	Investments in Other Joint Ventures and Associates	Elimination	Total
<i>(in million Baht)</i>									
<b>At 31 December 2018</b>									
Segment assets	72,671	74,561	179,071	14,226	60,628	90,078	45,370	(67,350)	469,255
Investment in joint ventures and associates	-	-	46	792	-	-	45,370	-	46,208
Change in non-current assets	(2,362)	(848)	19,245	(135)	7,806	23,135	4,590	(21,696)	29,735
<b>At 31 December 2017</b>									
Segment assets	73,828	77,364	156,873	15,687	49,549	64,848	40,780	(43,965)	434,964
Investment in joint ventures and associates	-	-	45	754	-	-	40,780	-	41,579
Change in non-current assets	(2,830)	(467)	626	(2,013)	1,149	11,749	2,173	(495)	9,892

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### *Geographical segments*

In presenting information on the basis of geographical segments, segment sales and service revenues are based on the geographical location of customers. Segment non-current assets (exclude derivatives and deferred tax) are based on the geographical location of the assets.

### *Geographical information*

	<b>Revenues</b>	
	2018	2017
	<i>(in million Baht)</i>	
Thailand	316,080	286,497
The People's Republic of China	70,588	50,476
Vietnam	27,524	22,240
Singapore	34,337	19,940
India	7,150	7,142
Malaysia	7,292	5,619
Indonesia	7,079	5,466
Japan	4,589	5,061
United States of America	3,509	2,171
Other countries	40,507	35,309
<b>Total</b>	<b>518,655</b>	<b>439,921</b>

	<b>Non-current assets (excluding deferred tax assets and derivatives)</b>	
	2018	2017
	<i>(in million Baht)</i>	
Thailand	302,864	272,814
United States of America	8,353	7,705
France	7,681	8,662
Malaysia	4,526	4,531
Other countries	228	204
<b>Total</b>	<b>323,652</b>	<b>293,916</b>

### *Major customers*

The Group's sales and service revenues mainly comprise revenue from one customer of Refinery and shared facilities, Aromatics and Olefins and derivatives segment representing Baht 124,542 million (2017: Baht 148,614 million).



# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 27 Selling and distribution expenses

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Distribution	2,981	2,694	1,882	1,681
Promotional	98	100	19	22
Marketing	120	93	56	36
Personnel	207	169	-	-
<b>Total</b>	<b>3,406</b>	<b>3,056</b>	<b>1,957</b>	<b>1,739</b>

### 28 Administrative expenses

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
Personnel expense	5,265	5,138	3,686	3,355
Professional and consultancy fee	1,624	1,121	1,569	1,191
Depreciation and amortisation	1,137	1,313	690	654
Loss on disposal of fixed assets	23	744	4	626
Donation	155	225	150	219
Secondment fee	65	55	97	215
Others	3,180	2,545	2,040	1,461
<b>Total</b>	<b>11,449</b>	<b>11,141</b>	<b>8,236</b>	<b>7,721</b>

### 29 Employee benefit expenses

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
		<i>(in million Baht)</i>			
Salaries, bonus, wages and other welfares		13,650	12,732	8,556	7,762
Contribution to provident funds		561	529	472	439
Defined benefit plans	23	326	272	226	184
Other long-term employee benefits		58	211	46	163
<b>Total</b>		<b>14,595</b>	<b>13,744</b>	<b>9,300</b>	<b>8,548</b>

#### *Defined contribution plans*

The defined contribution plans comprise provident funds established by the Group for its employees. Membership to the funds is on a voluntary basis. Contributions are made monthly by the employees at the minimum rate as required by law not exceeding 15% of their basic salaries and the Group contributes at the minimum rate as required by law not exceeding 15% of the employees' basic salaries. The provident funds are registered with the Ministry of Finance as juristic entities and are managed by a licensed Fund Manager.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 30 Expenses by nature

The statements of comprehensive income include an analysis of expenses by function. Expenses by nature disclosed in accordance with the requirements of various TFRS were as follows:

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b><i>Included in cost of sales of goods:</i></b>				
Changes in inventories of finished goods and work in progress	(810)	114	210	(2,764)
Raw materials used	389,710	309,939	331,200	253,686
Personnel expense	9,123	8,437	5,614	5,193
Depreciation of property, plant and equipment	16,310	16,466	12,217	12,494
Amortisation of intangible assets	368	367	253	220
<b><i>Included in selling and distribution and administrative expenses:</i></b>				
Personnel expense	5,472	5,307	3,686	3,355
Depreciation of property, plant and equipment	787	978	479	448
Amortisation of intangible assets	350	335	211	206
Minimum lease payments recognised as an operating lease expense	640	640	328	334

### 31 Finance costs

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
		<i>(in million Baht)</i>			
<b><i>Interest expense :</i></b>					
Subsidiaries	6	-	-	427	26
Debentures		2,227	2,200	1,880	2,200
Bank loans and overdrafts		1,154	1,341	493	681
Loans from other parties		168	114	-	-
<b>Total interest expense</b>		<b>3,549</b>	<b>3,655</b>	<b>2,800</b>	<b>2,907</b>
Other finance costs		548	421	319	284
<i>Less: Capitalised as cost of assets under construction</i>	15	(504)	(141)	(192)	(119)
<b>Net</b>		<b>3,593</b>	<b>3,935</b>	<b>2,927</b>	<b>3,072</b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**32 Income tax expense**

	Note	Consolidated financial statements		Separate financial statements	
		2018	2017	2018	2017
<i>(in million Baht)</i>					
<b>Current tax expense</b>					
Current year		3,509	4,144	3,038	3,574
Under provided in prior years		21	25	25	16
		<u>3,530</u>	<u>4,169</u>	<u>3,063</u>	<u>3,590</u>
<b>Deferred tax expense</b>					
Movements in temporary differences	19	(544)	(306)	165	(125)
<b>Total</b>		<b><u>2,986</u></b>	<b><u>3,863</u></b>	<b><u>3,228</u></b>	<b><u>3,465</u></b>

**Reconciliation of effective tax rate**

	Consolidated financial statements			
	2018		2017	
	Rate (%)	(in million Baht)	Rate (%)	(in million Baht)
Profit before income tax expense		<u>43,257</u>		<u>45,983</u>
Income tax using the Thai corporation tax rate	20.0	8,651	20.0	9,197
Effect of different tax rates in foreign jurisdictions		32		200
Income not subject to tax		(5,995)		(6,616)
Expenses not deductible for tax purposes		232		1,014
Under provided in prior years		21		25
Others		45		43
<b>Total</b>	<b>6.9</b>	<b><u>2,986</u></b>	<b>8.4</b>	<b><u>3,863</u></b>

	Separate financial statements			
	2018		2017	
	Rate (%)	(in million Baht)	Rate (%)	(in million Baht)
Profit before income tax expense		<u>32,949</u>		<u>38,988</u>
Income tax using the Thai corporation tax rate	20.0	6,590	20.0	7,798
Income not subject to tax		(3,521)		(5,356)
Expenses not deductible for tax purposes		134		1,007
Under provided in prior years		25		16
<b>Total</b>	<b>9.8</b>	<b><u>3,228</u></b>	<b>8.9</b>	<b><u>3,465</u></b>

**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

**33 Promotional privileges**

By virtue of the provisions of the Industrial Investment Promotion Act of B.E. 2520, the Company has been granted privileges by the Board of Investment relating to production of upstream, intermediate and downstream petrochemical, utilities and production support facilities, jetty for transportation and storage of liquid product and transportation by marine vessels, production of petroleum product, research and development of polymer products and chemical formula, lab testing services and refinery. The privileges granted include:

- (a) exemption from payment of import duty on machinery approved by the Board;
- (b) exemption from payment of income tax not over 100 percent of investment excluded land and working capital of certain operations for a period of eight years from the date on which the income is first derived from such operations
- (c) a 50% reduction in the normal income tax rate on the net profit derived from certain operations for a period of five years, commencing from the expiry date in (b) above.

As promoted companies, the Company must comply with certain terms and conditions prescribed in the promotional certificates.

Summary of revenues from promoted and non-promoted businesses:

	<b>Separate financial statements</b>					
	2018			2017		
	Promoted businesses	Non- promoted businesses	Total	Promoted businesses	Non- promoted businesses	Total
	<i>(in million Baht)</i>					
Export sales	2,927	52,985	55,912	5,566	39,635	45,201
Local sales	22,614	377,607	400,221	76,051	256,998	333,049
Service income	1	580	581	16	456	472
<b>Total revenue</b>	<b><u>25,542</u></b>	<b><u>431,172</u></b>	<b><u>456,714</u></b>	<b><u>81,633</u></b>	<b><u>297,089</u></b>	<b><u>378,722</u></b>

Certain subsidiaries in the Group have been granted promotional privileges as same as the Company.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 34 Basic earnings per share

The calculation of basic earnings per share for the year ended 31 December 2018 and 2017 were based on the profit for the years attributable to ordinary shareholders of the Company and the weighted average number of ordinary shares outstanding during the years as follows:

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht / million shares)</i>			
Profit attributable to ordinary shareholders of the Company (basic)	40,069.49	39,298.31	29,720.82	35,522.94
Number of ordinary shares as at 1 January	4,508.85	4,508.85	4,508.85	4,508.85
Effect of treasury shares	-	(37.18)	-	(37.18)
Weighted average number of ordinary shares outstanding (basic)	4,508.85	4,471.67	4,508.85	4,471.67
<b>Earnings per share (basic) (in Baht)</b>	<b>8.89</b>	<b>8.79</b>	<b>6.59</b>	<b>7.94</b>

### 35 Dividends

At the Board of Directors' Meeting of the Company held on 20 August 2018, the Board approved the appropriation of interim dividends from the earnings from 1 January 2018 to 30 June 2018 at Baht 1.75 per share. The dividend amounting to Baht 7,890 million was paid to the rightful shareholders in September 2018.

At the Annual General Meeting of the shareholders of the Company held on 9 April 2018, the shareholders approved the appropriation of annual dividend from 2017 performance at Baht 4.25 per share, amounting to Baht 19,087 million. The Company had paid interim dividend of the first half year of 2017 at Baht 1.75 per share, amounting to Baht 7,815 million on 18 September 2017. The remaining dividend was paid for the second half year of 2017 at Baht 2.50 per share, amounting to Baht 11,272 million. The dividend was paid to the shareholders in April 2018.

At the Board of Directors' Meeting of the Company held on 21 August 2017, the Board approved the appropriation of interim dividends from the earnings from 1 January 2017 to 30 June 2017 at Baht 1.75 per share. The dividend amounting to Baht 7,815 million was paid to the rightful shareholders in September 2017.

At the Annual General Meeting of the shareholders of the Company held on 5 April 2017, the shareholders approved the appropriation of annual dividend from 2016 performance at Baht 2.85 per share, amounting to Baht 12,713 million. The Company had paid interim dividend of the first half year of 2016 at Baht 1.05 per share, amounting to Baht 4,683 million on 20 September 2016. The remaining dividend was paid for the second half year of 2016 at Baht 1.80 per share, amounting to Baht 8,029 million. The dividend was paid to the shareholders in April 2017.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

**For the year ended 31 December 2018**

### **36 Financial instruments**

#### *Financial risk management policies*

The Group is exposed to normal business risks from changes in market interest rates and currency exchange rates and from non-performance of contractual obligations by counterparties. The Group does not hold or issue derivative financial instruments for speculative or trading purposes.

Risk management is integral to the whole business of the Group. The management continually monitors the Group's risk management process to ensure that an appropriate balance between risk and control is achieved.

#### *Capital management*

The Company's Board of Directors' policy is to maintain a strong capital base so as to maintain investor, creditor, partners and other stakeholders. In addition, the Board monitors the return on capital and the level of dividends to ensure business sustainability.

#### *Interest rate risk*

Interest rate risk is the risk that future movements in market interest rates will affect the results of the Group's operations and its cash flows because the Group's finances loans which have both floating and fixed interest rates for their operations. The Group has managed this risk to ensure the appropriateness to the business operation.

The effective interest rates of interest-bearing liabilities at 31 December 2018 and 2017 and the periods in which those liabilities mature or re-price were disclosed in note 20 to the financial statements.

#### *Foreign currency risk*

The Group is exposed to foreign currency risk relating to purchases, sales, and construction payment, including borrowings which are denominated in foreign currencies. The Group primarily utilises forward exchange contracts to hedge such financial assets and liabilities denominated in foreign currencies. The forward exchange contracts entered into at the reporting date also relate to anticipated purchases and sales, denominated in foreign currencies, for the subsequent period.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

At 31 December, the Group was exposed to foreign currency risk in respect of financial assets and liabilities denominated in the following currencies:

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>USD</b>				
Cash and cash equivalents	18,293	13,744	15,627	11,048
Trade accounts receivable	13,617	10,473	9,027	7,928
Other receivables	1,003	293	786	246
Short-term loans to related party	242	-	242	-
Long-term loans to related party	3,551	6,665	3,551	6,665
Long-term loans to other parties	665	670	-	-
Other investments	5,003	4,129	3,680	4,129
Interest-bearing liabilities	(34,754)	(36,212)	(33,799)	(34,687)
Trade accounts payable	(1,392)	(2,296)	(235)	(1,579)
Payable to contractors	(3,527)	(808)	(1,807)	(408)
Other payables	(3,679)	(2,856)	(1,441)	(2,268)
<b>Gross statement of financial position exposure</b>	<b>(978)</b>	<b>(6,198)</b>	<b>(4,369)</b>	<b>(8,926)</b>
<b>Currency forwards</b>	<b>14,780</b>	<b>6,621</b>	<b>5,225</b>	<b>(3,270)</b>

The Group performs foreign currency risk management on assets and liabilities held in USD. The Group has net liabilities under USD currency. The Group manages net USD liabilities by naturally hedged USD portion of net profit to minimise the impact from fluctuations in foreign currency to the Group's performance.

In addition to forward exchange contracts, the Group uses derivatives financial instruments, principally currency swaps and interest rate swap, to manage exposure to fluctuations in interest rates and in exchange rates. As at 31 December 2018, the Group entered into interest rate swap contracts, totalling Baht 4 million (2017: Baht 11 million) to repay certain interest bearing liabilities in foreign currencies.

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>EUR</b>				
Cash and cash equivalents	185	483	-	-
Trade accounts receivable	1,638	1,494	-	-
Other receivables	136	110	18	4
Value-added tax receivable	187	109	-	-
Other investments	283	283	-	-
Interest-bearing liabilities	(5,902)	(6,529)	-	-
Trade accounts payable	(1,742)	(1,870)	-	-
Payable to contractors	(18)	(11)	(14)	(9)
Other payables	(494)	(550)	(45)	(59)
<b>Gross statement of financial position exposure</b>	<b>(5,727)</b>	<b>(6,481)</b>	<b>(41)</b>	<b>(64)</b>
<b>Currency forwards</b>	<b>18</b>	<b>18</b>	<b>-</b>	<b>-</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b>Others</b>				
Cash and cash equivalents	202	51	1	-
Trade accounts receivable	171	175	-	-
Other receivables	20	24	-	-
Value-added tax receivable	6	-	-	-
Interest-bearing liabilities	(1)	-	-	-
Trade accounts payable	(13)	(16)	-	-
Payable to contractors	(59)	(13)	(31)	(13)
Other payables	(87)	(18)	(37)	(8)
<b>Gross statement of financial position exposure</b>	<b>239</b>	<b>203</b>	<b>(67)</b>	<b>(21)</b>
<b>Currency forwards</b>	<b>748</b>	<b>-</b>	<b>-</b>	<b>-</b>

### **Credit risk**

Credit risk is risk of failure from a customer or a counterparty to settle its obligations to the Group as and when they fall due.

Management has a policy in place and the exposure to credit risk is monitored on an ongoing basis. Credit evaluations are performed on all customers requiring credit over a certain amount. At the reporting date, there were no significant concentrations of credit risk. The maximum exposure to credit risk is represented by the carrying amount of each financial asset in the statement of financial position. However, the majority of the customers are on the long-term contracted commitment and parts of them are the Company's shareholders which the company has consistently collected from them. For the customers who do not have the long-term contracted commitments, the Group monitors the risk on an ongoing basis and would do the business only with the credible customers by limiting the credit lines and requesting the guarantee on some cases. For the export, the credit of counterparty will be considered. The Group will demand a payment on a case to case basis and also has commercial credit insurance. Management does not anticipate material losses from its debt collection.

### **Liquidity risk**

The Group monitors its liquidity risk and maintains a level of cash and cash equivalents deemed adequate by management to finance the Group's operations and to mitigate the effects of fluctuations in cash flows.

### **Carrying amount and fair values**

As at 31 December 2018 and 2017, fair values of financial assets and liabilities are taken to approximately the carrying value, except the following items:



**PTT Global Chemical Public Company Limited and its Subsidiaries**  
**Notes to the financial statements**  
**For the year ended 31 December 2018**

	<b>Consolidated financial statements</b>						
	Carrying value			Fair value			
	Current	Non-current	Total	Level 1	Level 2	Level 3	Total
	<i>(in million Baht)</i>						
<b>31 December 2018</b>							
<b><i>Financial assets</i></b>							
Debt securities							
available-for-sale	6,315	5,957	12,272	-	12,272	-	12,272
Equity securities							
available-for-sale	-	362	362	362	-	-	362
Derivatives	341	122	463	-	463	-	463
<b><i>Financial liabilities</i></b>							
Debentures	1,942	52,408	54,350	-	55,290	-	55,290
Derivatives	311	147	458	-	458	-	458
<b>31 December 2017</b>							
<b><i>Financial assets</i></b>							
Debt securities							
available-for-sale	3,048	9,334	12,382	-	12,382	-	12,382
Equity securities							
available-for-sale	-	365	365	365	-	-	365
Derivatives	134	1	135	-	135	-	135
<b><i>Financial liabilities</i></b>							
Debentures	-	54,645	54,645	-	57,668	-	57,668
Derivatives	716	-	716	-	716	-	716

	<b>Separate financial statements</b>						
	Carrying value			Fair value			
	Current	Non-current	Total	Level 1	Level 2	Level 3	Total
	<i>(in million Baht)</i>						
<b>31 December 2018</b>							
<b><i>Financial assets</i></b>							
Debt securities							
available-for-sale	6,315	5,957	12,272	-	12,272	-	12,272
Equity securities							
available-for-sale	-	362	362	362	-	-	362
Derivatives	340	122	462	-	462	-	462
<b><i>Financial liabilities</i></b>							
Long-term loans							
from related party	-	16,105	16,105	-	16,530	-	16,530
Debentures	1,942	36,379	38,321	-	39,082	-	39,082
Derivatives	3	21	24	-	24	-	24

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	Separate financial statements						Total
	Carrying value			Fair value			
	Current	Non-current	Total	Level 1	Level 2	Level 3	
<i>(in million Baht)</i>							
<b>31 December 2017</b>							
<b>Financial assets</b>							
Debt securities							
available-for-sale	3,048	9,334	12,382	-	12,382	-	12,382
Equity securities							
available-for-sale	-	365	365	365	-	-	365
Derivatives	126	1	127	-	127	-	127
<b>Financial liabilities</b>							
Debentures	-	54,645	54,645	-	57,668	-	57,668
Derivatives	138	-	138	-	138	-	138

Level 2 fair values for debt instrument are based on the yield rate quoted by the Thai Bond Market Association or other markets and for simple over-the-counter derivative financial instruments are based on broker quotes. Those quotes are tested for reasonableness by discounting expected future cash flows using market interest rate for a similar instrument at the measurement date. Fair values reflect the credit risk of the instrument and include adjustments to take account of the credit risk of the Group and counterparty when appropriate.

### 37 Commitments with non-related parties

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
<i>(in million Baht)</i>				
<b>Capital commitments</b>				
<i>Contracted but not provided for</i>				
Land	2	3	2	3
Plant, machinery and equipment	31,460	24,663	19,006	2,273
Buildings	38	25	36	23
Others	617	910	199	439
<b>Total</b>	<b>32,117</b>	<b>25,601</b>	<b>19,243</b>	<b>2,738</b>
<b>Non-cancellable operating lease commitments</b>				
Within one year	195	180	121	116
After one year but within five years	888	884	649	657
After five years	2,402	2,542	2,097	2,236
<b>Total</b>	<b>3,485</b>	<b>3,606</b>	<b>2,867</b>	<b>3,009</b>

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

	Consolidated financial statements		Separate financial statements	
	2018	2017	2018	2017
	<i>(in million Baht)</i>			
<b><i>Other commitments</i></b>				
Unused letters of credits	383	94	-	-
Bank guarantees	2,043	2,627	266	323
Guarantees for credit facilities and bank guarantees	2,784	11,475	25,002	11,475
Other agreements	9,524	9,693	9,047	9,351
<b>Total</b>	<b>14,734</b>	<b>23,889</b>	<b>34,315</b>	<b>21,149</b>

As of 31 December 2018 and 2017, the Company and a subsidiary had capital commitments as follows:

- a) The Company had commitments relating to Olefins Reconfiguration Project totaling Baht 16,125 million (2017: Baht 1,179 million). The project is planning to start commercial operation within 2020.
- b) A subsidiary had commitments relating to Propylene Oxide (PO) Project totaling Baht 9,013 million (2017: Baht 15,186 million). The project is planning to start commercial operation within 2020.

### Utilities and Other Services Agreements with minimum purchase quantity

The Group has 39 utilities and other services agreements which have minimum purchase quantity with other parties. These agreements are for the periods from 1 year to 21 years, commencing from the date as specified in each agreement and expiring in July 2019 to September 2035. The minimum sales and purchase quantity, the selling price of products and the renewal of the contract will be subject as specified in the agreements.

## 38 Litigation

### (a) Purchase and sales of raw materials agreement legal case

On 3 December 2009, a company filed for arbitration against PTT Plc. (“PTT”) and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 13,805 million. On 8 March 2010, the dispute was thrown out of the case-list by the arbitration ruling that the Company was not a party to the contract.

On 27 August 2010, the said company filed a civil suit against PTT and the Company as a producer to perform according to purchase and sales of raw materials agreement, of which the said company has been committed by PTT, or to compensate for damages of approximately Baht 9,380 million. In this regards, the Company filed objections against the indictment with the civil court on the basis that the Company was not a party to the contract.

On 21 May 2013, the Civil Court considered that the arbitration process between such company and PTT has not yet finalised; therefore, they have temporarily thrown out of the case-list until the final decision has been reached under arbitration process. Then, either party or both parties can resubmit the case to the Civil Court for the further trail.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

### **For the year ended 31 December 2018**

Subsequently, on 25 March 2016, the arbitration has reached a conclusion for PTT to compensate the damages in some amount. Currently, this case is under consideration of Civil Court as per the petition of PTT requesting to withdraw award of arbitrator. The Company believes that the outcome of the consideration will not result in any liability to the Company, and therefore, has not provided against any loss that may result from this matter in the financial statements.

#### **(b) Oil spill incident legal case**

During the 3rd quarter of 2014, the number of people in Rayong filed several lawsuits with the Civil Court and Rayong Provincial Court against the Company to claim the extra compensation from oil spill incident and to perform the rehabilitation of the sea and natural environmental recovery. Some cases have been dismissed and some cases have been passed a judgement by the Civil Court on 25 August 2016 ordered the Company to compensate for damages including interest and rehabilitation, of approximately Baht 11.26 million. The Company has appealed on 17 February 2017. Subsequently, on 11 May 2018, the Company made a compromise agreement with most plaintiffs at the Civil Court. On 20 December 2018, the Appeal Court has passed their judgement according to the compromise contracts which the Company has already paid compensation in full amount. For the remaining plaintiffs, the Appeal Court ordered the Company to pay compensation and interest according to the Civil Court's judgement and reduced the amount of interest. On 28 September 2018, Rayong Provincial Court has made the judgement ordering the Company to pay damage cost with interest by deducting the remedy paid payment approximately Bath 38 million of which Baht 24 million has been paid and the remaining amount will be paid to Deposit of Property Office.

#### **(c) Transfer of right for the payment of raw materials legal case of the subsidiary**

On 20 August 2018, the third party filed a civil lawsuit against the supplier of the subsidiary and the subsidiary as joint defendants for violation of loan agreement and transfer of claim, with damage claimed amounting to Baht 308.75 million with interest rate at 15% per annum amounting to Baht 15.90 million, totalling Baht 324.65 million. The supplier borrowed from the third party to purchase raw materials to sell to the subsidiary and the subsidiary had to pay for the raw materials to that third party under the transfer of right for the payment of raw materials. The legal advisor of the subsidiary provided the opinion that if it can be proven that the delivery of the materials had not been made to the subsidiary, the subsidiary should not have any obligation to pay for such payments. The Court specified the day of determination of dispute issue and the legal process or plaintiff's witness hearing to be taken on 26 November 2018, which the parties announced to the court that they could not negotiate a settlement, the court therefore determined the dispute issues and scheduled the trial hearing of the plaintiff and defendant's witnesses in July 2019.

# PTT Global Chemical Public Company Limited and its Subsidiaries

## Notes to the financial statements

For the year ended 31 December 2018

### 39 Thai Financial Reporting Standards (TFRS) not yet adopted

A number of new and revised TFRS which relevant to the Group's operations are expected to have significant impact on the consolidated and separate financial statements on the date of initial application. Those TFRS become effective for annual financial reporting periods beginning on or after 1 January of the following years.

<b>TFRS</b>	<b>Topic</b>	<b>Effective</b>
TFRS 15	Revenue from Contracts with Customers	2019
TFRS 7*	Financial Instruments: Disclosures	2020
TFRS 9*	Financial Instruments	2020
TAS 32*	Financial Instruments: Presentation	2020
TFRIC 16*	Hedges of a Net Investment in a Foreign Operation	2020
TFRIC 19*	Extinguishing Financial Liabilities with Equity Instruments	2020

\* *TFRS - Financial instruments standards*

#### ***TFRS 15 Revenue from Contracts with Customers***

TFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognised. Revenue should be recognised when (or as) an entity transfers control over goods or services to a customer, measured at the amount to which the entity expects to be entitled.

The Group has completed assessment of potential impact of adopting TFRS 15 on the financial statements and there is no material impact on the consolidated and separate financial statements.

#### ***TFRS - Financial instruments standards***

These TFRS establish requirements related to definition, recognition, measurement, impairment and derecognition of financial assets and financial liabilities, including accounting for derivatives and hedge accounting.

The Group is presently considering the potential impact of adopting and initially applying TFRS - Financial instruments standards on the consolidated and separate financial statements.

# **PTT Global Chemical Public Company Limited and its Subsidiaries**

## **Notes to the financial statements**

### **For the year ended 31 December 2018**

#### **40 Events after the reporting period**

At the Board of Directors' meeting held on 18 February 2019, the Board approved to submit for approval at the Annual General Meeting of the Shareholders, a full year 2018 dividend payment at the rate of Baht 4.25 per share, of which Baht 1.75 per share was paid as an interim dividend in September 2018 as discussed in note 35. Thus, the remaining dividend will be at the rate of Baht 2.50 per share to the shareholders entitled to receive dividends. This dividend is subject to the approval of the Shareholders at the Annual General Meeting to be held on 5 April 2019.

At the Board of Directors' meeting of Global Green Chemicals Public Company Limited which is a subsidiary held on 18 February 2019, the Board agreed to propose the shareholders at the Annual General Meeting of the Shareholders of Global Green Chemicals Public Company Limited on 2 April 2019 to consider and approve the following;

- Reduction of the registered capital of Global Green Chemicals Public Company Limited from Baht 10,483.33 million to the new registered capital of Baht 10,236.67 million by decreasing the remaining unissued registered capital of 24.67 million shares with a par value of Bath 10 each;
- Transfer of appropriated legal reserve and share premium to compensate the deficit of Global Green Chemicals Public Company Limited;
- Reduction of the registered and paid-up capital of Global Green Chemicals Public Company Limited from Baht 10,236.67 million to Baht 9,724.83 million by reducing par value from Baht 10 to Baht 9.50 to compensate the deficit of Global Green Chemicals Public Company Limited.

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