

FY2023 3rd Quarter (April 1-December 31) Financial Statements

JERA Co., Inc.

- **Condensed Quarterly Consolidated Statement of Profit or Loss**
- **Condensed Quarterly Consolidated Statement of Financial Position**
- **Condensed Quarterly Consolidated Statement of Cash Flows**

Condensed Quarterly Consolidated Statement of Profit or Loss

(From April 1, 2023 to Dec 31, 2023)

(Unit: Millions of yen)

Item	Amount
Revenue	2,782,518
Cost of sales	(2,208,202)
Gross profit	574,316
Selling, general and administrative expenses	(137,791)
Other income	5,369
Other expenses	(18,454)
Share of profit (loss) of investments accounted for using equity method	63,516
Operating profit	486,956
Finance income	51,950
Finance costs	(45,739)
Profit before tax	493,168
Income tax expense	(104,236)
Profit for the period	388,932
Profit for the period attributable to	
Owners of parent	338,937
Non-controlling interests	49,994
Profit for the period	388,932

Condensed Quarterly Consolidated Statement of Financial Position
(As of Dec 31, 2023)

(Unit: Millions of yen)

Item	Amount	Item	Amount
Assets		Liabilities and equity	
Current assets		Liabilities	
Cash and cash equivalents	1,401,490	Current liabilities	
Trade and other receivables	791,825	Trade and other payables	808,760
Inventories	410,439	Bonds and borrowings	678,435
Derivative assets	830,120	Lease liabilities	65,261
Other financial assets	60,920	Derivative liabilities	782,314
Other current assets	107,901	Other financial liabilities	41,176
Total current assets	3,602,698	Other current liabilities	226,137
Non-current assets		Total current liabilities	2,602,086
Property, plant and equipment	2,828,595	Non-current liabilities	
Right-of-use assets	330,729	Bonds and borrowings	2,665,326
Goodwill and intangible assets	219,768	Lease liabilities	285,174
Investments accounted for using equity method	1,321,874	Derivative liabilities	219,629
Derivative assets	266,785	Other financial liabilities	224,606
Other financial assets	154,570	Deferred tax liabilities	60,165
Deferred tax assets	95,730	Other non-current liabilities	156,012
Other non-current assets	21,746	Total non-current liabilities	3,610,914
Total non-current assets	5,239,800	Total liabilities	6,213,000
		Equity	
		Share capital	100,000
		Capital surplus	1,179,251
		Other equity instruments	199,392
		Retained earnings	656,466
		Other components of equity	470,078
		Total equity attributable to owners of parent	2,605,189
		Non-controlling interests	24,308
		Total equity	2,629,498
Total assets	8,842,498	Total liabilities and equity	8,842,498

Condensed Quarterly Consolidated Statement of Cash Flows
(From April 1, 2023 to December 31, 2023)

(Unit: Millions of yen)

Item	Amount
Cash flows from operating activities	
Profit before tax	493,168
Depreciation and amortization	205,948
Finance income and finance costs	(7,803)
Share of loss (profit) of investments accounted for using equity method	(63,516)
Decrease (increase) in trade and other receivables	209,097
Decrease (increase) in inventories	45,001
Increase (decrease) in trade and other payables	98,493
Increase (decrease) in derivative assets and derivative liabilities	91,536
Decrease (increase) in other financial assets	71,890
Increase (decrease) in other financial liabilities	(155,538)
Other	28,310
Subtotal	1,016,588
Dividends received	21,736
Interest received	37,307
Interest paid	(34,283)
Income taxes refund (paid)	(30,010)
Cash flows from operating activities	1,011,339
Cash flows from investing activities	
Purchase of property, plant and equipment	(178,813)
Proceeds from sale of property, plant and equipment	5,733
Purchase of intangible assets	(5,028)
Purchase of investment securities	(59,596)
Proceeds from sale of investment securities	7,124
Purchase of shares of subsidiaries resulting in change in scope of consolidation	(239,280)
Other	6,080
Cash flows from investing activities	(463,782)
Cash flows from financing activities	
Net increase (decrease) in short-term borrowings	(226,441)
Net increase (decrease) in commercial paper	(99,000)
Proceeds from long-term borrowings	143,698
Repayments of long-term borrowings	(395,567)
Proceeds from issuance of bonds	109,699
Repayments of lease liabilities	(56,747)
Dividends paid	-
Dividends paid to non-controlling interests	(63,582)
Distributions to holders of other equity instruments	(3,013)
Proceeds from issuance of other equity instruments	-
Other	8,511
Cash flows from financing activities	(582,443)
Effect of exchange rate changes on cash and cash equivalents	75,470
Net increase (decrease) in cash and cash equivalents	40,584
Cash and cash equivalents at beginning of period	1,360,906
Cash and cash equivalents at end of period	1,401,490



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FY2023 Third Quarter Consolidated Financial Results

(Note1) The company's fiscal year (FY) is from April 1 to March 31 of the following year in this material.

“3Q” refers to the period from April 1 to December 31.

(Note2) The Company has voluntarily adopted International Financial Reporting Standards (IFRS) from the consolidated financial statements for the fiscal year ended March 31, 2023 (FY2022).

Therefore, the following pages and thereafter have been prepared in accordance with IFRS.

JERA Co., Inc.

January 31, 2024

Outline of Financial Results

Consolidated Statement of Profit or Loss

(Unit: Billion Yen)

	2023/3Q(A)	2022/3Q(B)	Change(A-B)	Rate of Change(%)
Revenue (Net sales)	2,782.5	3,342.5	-560.0	-16.8
Operating profit / loss	486.9	-92.3	579.3	-
Quarterly profit / loss attributable to owners of parent	338.9	-133.2	472.1	-
<Reference> Quarterly profit excluding time lag	121.6	297.9	-176.2	-59.2

Consolidated Statement of Financial Position

(Unit: Billion Yen)

	As of Dec 31,2023(A)	As of Mar 31,2023(B)	Change(A-B)	Rate of Change(%)
Assets	8,842.4	9,172.3	-329.8	-3.6
Liabilities	6,213.0	7,132.6	-919.6	-12.9
Equity	2,629.4	2,039.7	589.7	28.9

Key Points of Financial Results

【Revenue】

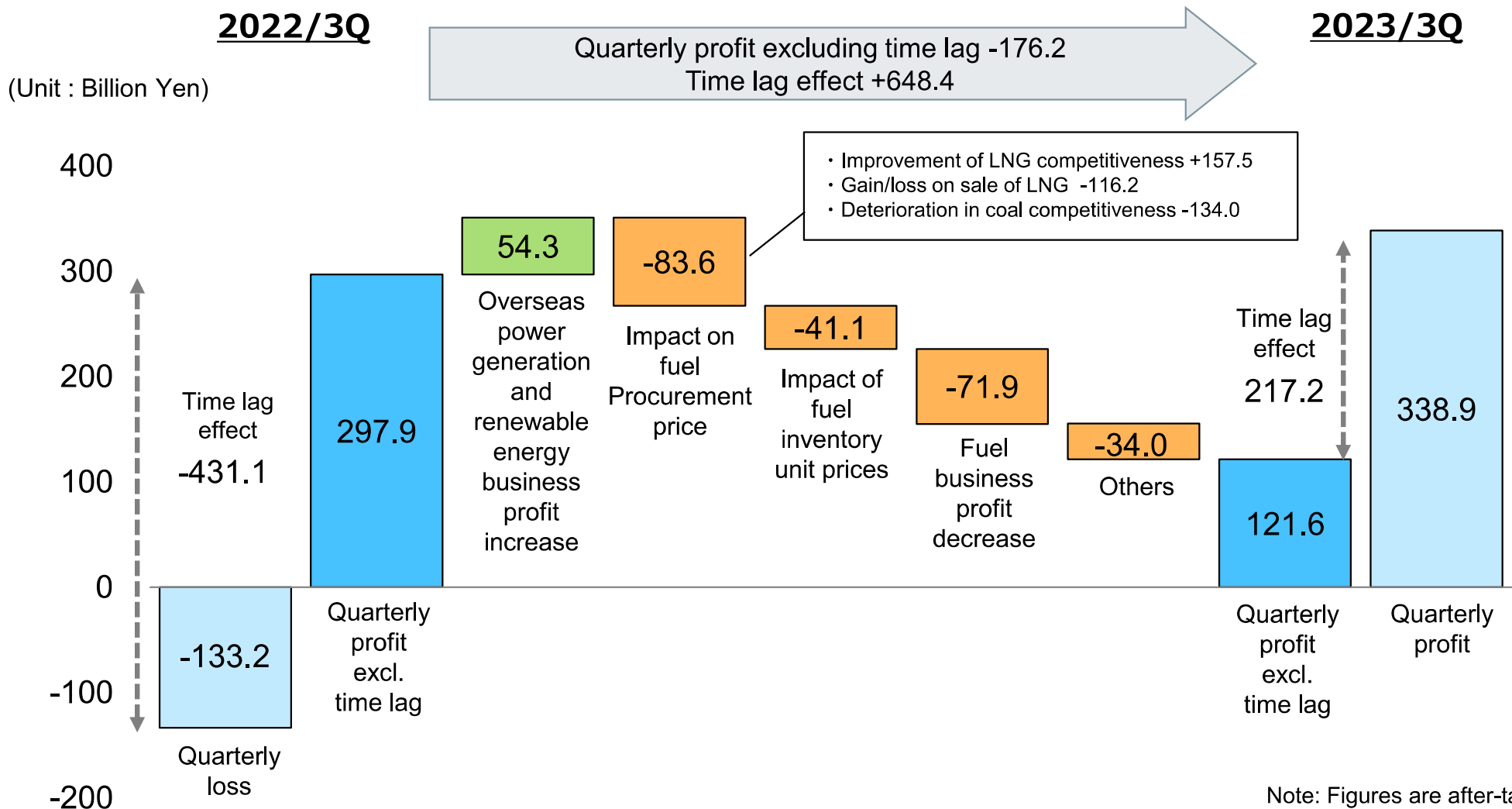
- **Revenue decreased by 560.0 billion yen (down 16.8%) from the same period last year to 2,782.5 billion yen** mainly due to a decrease in electrical energy sold.

【Quarterly profit/loss】

- **Quarterly profit/loss increased by 472.1 billion yen from the same period last year -133.2 billion yen and rose to profit of 338.9 billion yen.**
 - The effect of time lag shifted from losses to gains.
(+648.4 billion yen [-431.1 billion yen to 217.2 billion yen])
 - Quarterly profit excluding time lag decreased.
(-176.2 billion yen [297.9 billion yen to 121.6 billion yen])
- Quarterly profit excluding time lag decreased due to the impact on fuel procurement price, the impact of fuel inventory unit prices, and the decrease in profit from fuel business, while the profit from overseas power generation and renewable energy business increased.

Change Factors of Quarterly Consolidated Profit/Loss

- Quarterly profit excluding time lag decreased due to the impact on fuel procurement price, the impact of fuel inventory unit prices, and the decrease in profit from the fuel business, while profit from the overseas power generation and renewable energy business increased.



Consolidated Statement of profit or loss

(Unit: Billion Yen)

	2023/3Q(A)	2022/3Q(B)	Change(A-B)	Main Factors of Changes
Revenue (Net sales)	2,782.5	3,342.5	-560.0	• Decrease of electrical energy sold
Operating expenses	2,345.9	3,402.1	-1,056.1	• Decrease of fuel costs
Other operating income/ loss	50.4	-32.7	83.1	• Increase of share of profit / loss of investments accounted for using equity method +61.0 • Exchange income and loss +26.6
Operating profit / loss	486.9	-92.3	579.3	
Financial income	51.9	10.7	41.2	• Increase of interest received +32.7
Financial costs	45.7	51.3	-5.5	• Exchange income and loss -13.7 • Increase of interest paid +11.2
Profit / loss before tax	493.1	-132.9	626.1	• Decrease of time lag effect +900.5 (-598.8 → 301.7) • Decrease of profit excluding time lag -274.4 (465.8 → 191.4)
Income tax expense	104.2	-110.1	214.4	
Quarterly profit attributable to non-controlling Interests	49.9	110.5	-60.5	
Quarterly profit / loss attributable to owners of parent	338.9	-133.2	472.1	



Key Elements

	2023/3Q(A)	2022/3Q(B)	Change(A-B)
Electrical Energy Sold (TWh)	173.6	191.4	-17.8
Crude Oil Prices(JCC) (dollar/barrel)	86.6	107.8	-21.2
Foreign Exchange Rate (yen/dollar)	143.3	136.5	6.8

Note: Crude Oil Prices(JCC) for 2023/3Q is tentative.

Consolidated Statement of Financial Position

(Unit: Billion Yen)

	As of Dec 31,2023(A)	As of Mar 31,2023(B)	Change (A-B)	Main Factors of Changes
Cash and cash equivalents	1,401.4	1,360.9	40.5	
Property, plant and equipment	2,828.5	2,387.8	440.7	• Increase on acquisition of Parkwind, etc.
Investments accounted for using equity method	1,321.8	1,112.7	209.1	• Increase on acquisition of GPI, etc.
Others	3,290.5	4,310.8	-1,020.2	• Decrease of derivative assets (JERAGM, etc.) -903.7
Assets	8,842.4	9,172.3	-329.8	
Interest-bearing liabilities	3,343.7	3,510.8	-167.0	• Borrowings -180.4 • Commercial Paper -99.0 • Corporate Bonds +112.3
Others	2,869.2	3,621.8	-752.5	• Decrease of derivative liabilities (JERAGM, etc.) -925.8
Liabilities	6,213.0	7,132.6	-919.6	
Equity attributable to owners of parent	2,605.1	2,022.8	582.3	• Profit +338.9 • Foreign currency translation adjustments +179.8
Non-controlling interests	24.3	16.8	7.4	
Equity	2,629.4	2,039.7	589.7	

Consolidated Statement of Cash Flows

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(Unit: Billion Yen)

		2023/3Q(A)	2022/3Q(B)	Change(A-B)
Operating cash flow		1,011.3	-392.1	1,403.4
Investment cash flow	Purchase of property, plant, and equipment	-178.8	-285.8	107.0
	Purchase of investment securities	-59.5	-23.6	-35.9
	Others	-225.3	-48.6	-176.6
		-463.7	-358.2	-105.5
Free cash flows		547.5	-750.3	1,297.8
Financial cash flow	Increase (decrease) in interest-bearing debt	-467.6	958.9	-1,426.5
	Dividends paid *	0	-83.1	83.1
	Others	-114.8	-85.6	-29.1
		-582.4	790.1	-1,372.6
Increase (decrease)in cash and cash equivalents (minus indicates decrease)		40.5	79.4	-38.8

* Excluding Dividends paid to non-controlling interests

Segment Information

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(Unit: Billion Yen)

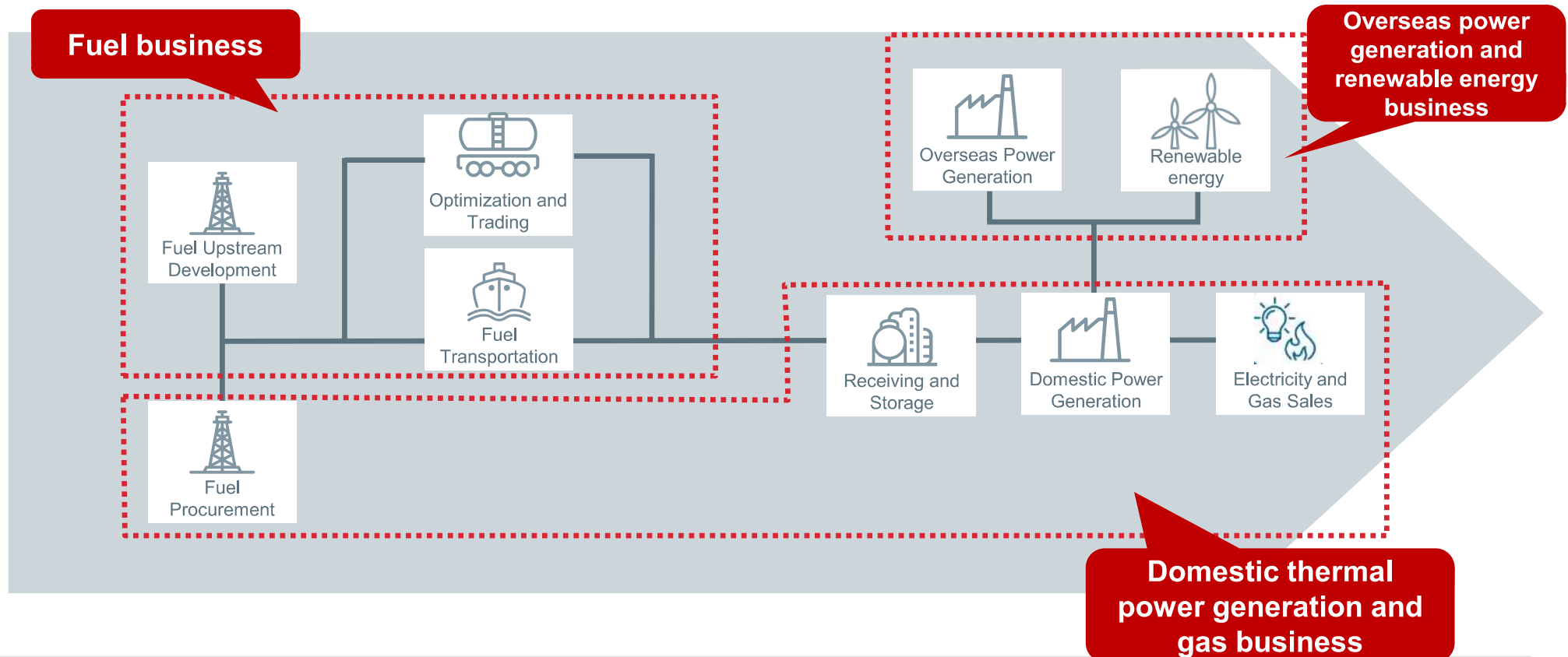
	2023/3Q(A)		2022/3Q(B)		Change(A-B)		Main Factors of Changes in Profit / Loss
	Revenue	Profit / Loss	Revenue	Profit / Loss	Revenue	Profit / Loss	
Fuel	319.6	96.9	512.0	168.9	-192.4	-71.9	•Profit decrease in JERAGM, etc.
Overseas power generation and renewable energy	37.9	39.9	3.3	-14.3	34.5	54.3	•Gain on reversal of impairment loss in Formosa 2 +19.6 •Profit increase in overseas IPPs, etc +34.6
Domestic thermal power generation and gas	3,318.2	223.2 -5.9※2	4,394.2	-187.4 243.6※2	-1,076.0	410.7 -237.7※2	•Improvement of LNG competitiveness +157.5 •Gain/loss on sale of LNG -116.2 •Deterioration in coal competitiveness -134.0 •Impact of fuel inventory unit prices -41.1
Adjustments※1	-893.2	-21.1	-1,567.1	-100.2	673.8	79.1	•Elimination of unfulfilled fuel contracts +35.7
Consolidated	2,782.5	338.9 121.6※2	3,342.5	-133.2 297.9※2	-560.0	472.1 -176.2※2	

※1 : “Adjustments” includes headquarter expenses and consolidation adjustments such as intersegment eliminations

※2 : Excluding the effect of time lag

(Reference) : JERA's Value Chain and Segment

- JERA owns the entire supply chains for fuel and thermal power generation, from fuel upstream business (development of gas fields) to transportation and storage (fuel terminal operation) to power generation and wholesaling.
- We have three business segments; "Fuel business" for investment in fuel upstream, transportation and trading business, "Overseas power generation and renewable energy business" for investment in overseas power generation and domestic and overseas renewable energy business, and "Domestic thermal power generation and gas business" for sales of electricity and gas in Japan.



FY2023 Forecast

- Profit excluding time lag is expected to be around 150 billion yen, while time lag profit is projected to be 200 billion yen, with a total profit of around 350 billion yen.
(No change from the previous forecast)
- Results may fluctuate due to changing trends in fuel markets and other factors.

(Unit: Billion Yen)

	Current Forecast(A)	Previous Forecast(B)	Change (A-B)	Rate of Change (%)
Profit	350.0	350.0	-	-
Time lag effect	200.0	200.0	-	-
Profit excl. time lag	150.0	150.0	-	-

【Reference : Comparison with the previous year's result】

(Unit: Billion Yen)

	Current Forecast(A)	FY2022 Result(B)	Change (A-B)	Rate of Change (%)
Profit	350.0	17.8	Approx. 330.0	1,866.3
Time lag effect	200.0	-182.4	Approx. 380.0	-
Profit excl. time lag	150.0	200.3	Approx. -50.0	-25.1

【Key Data】

	Current Forecast	4th Quarter of FY2023	Previous Forecast	【Reference】 FY2022 Result
Crude oil prices(JCC) (dollar/barrel)	Approx. 85	Approx.82	Approx.90	102.7
Foreign exchange rate (yen/dollar)	Approx.143	Approx.143	Approx.144	135.5

Appendix

Trends in crude oil price and exchange rates

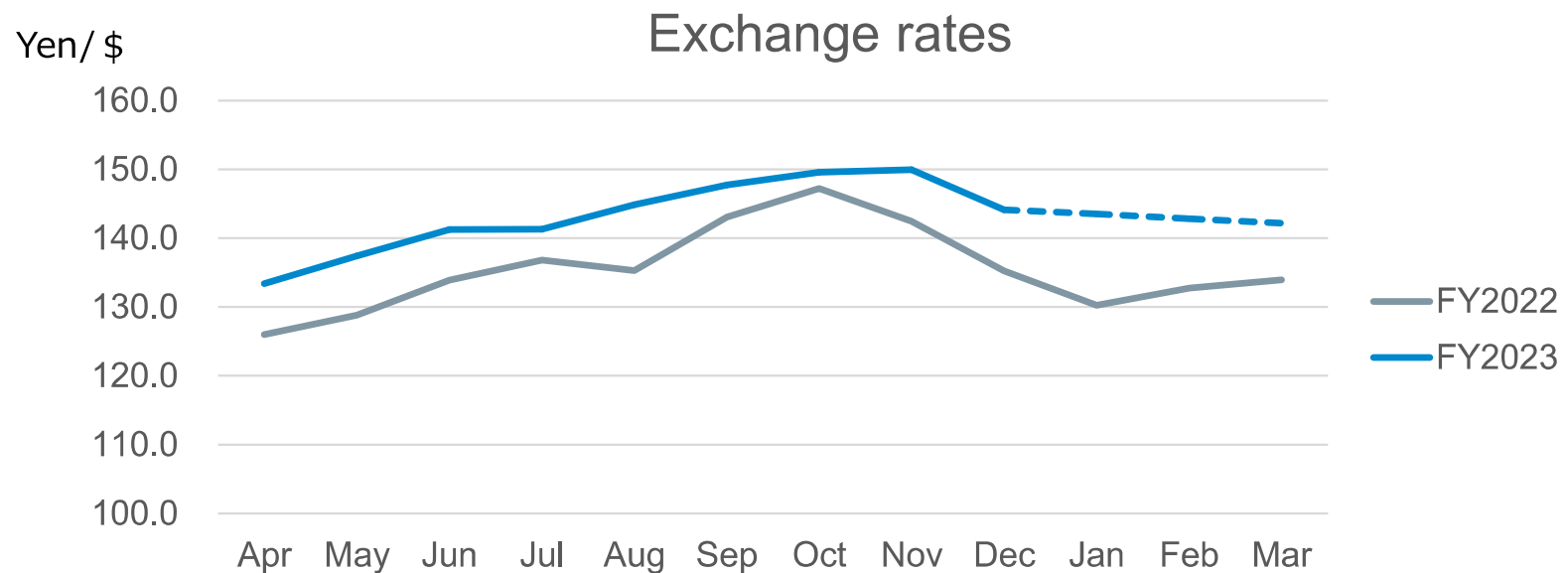
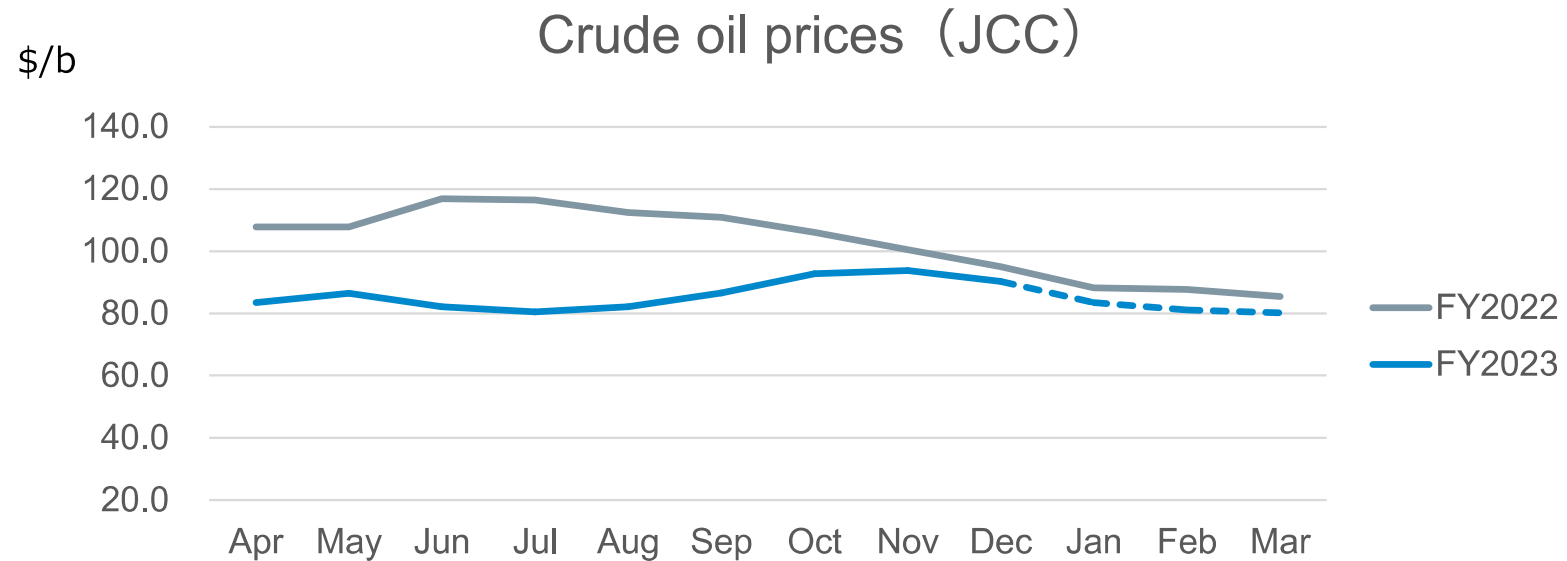
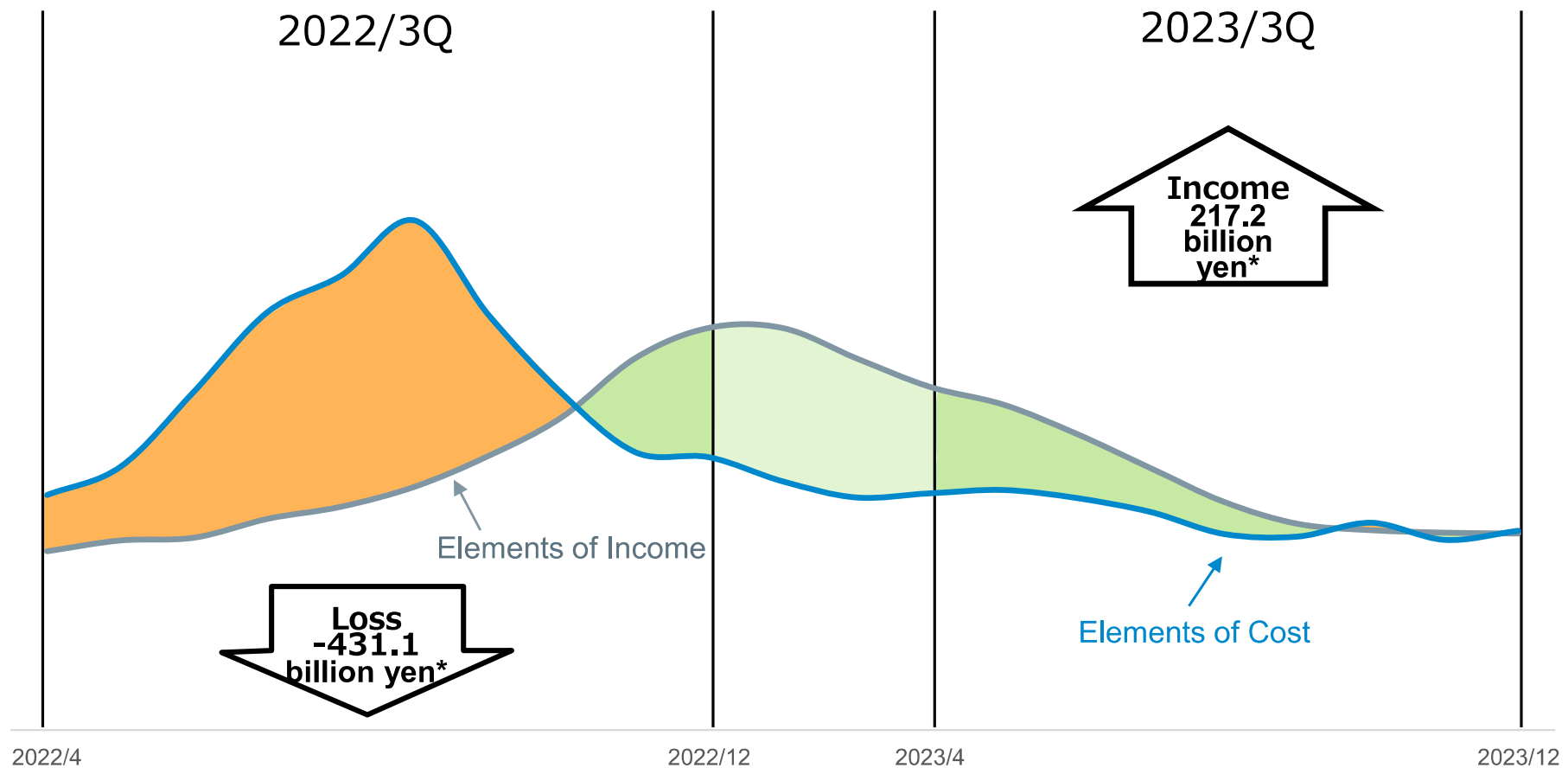


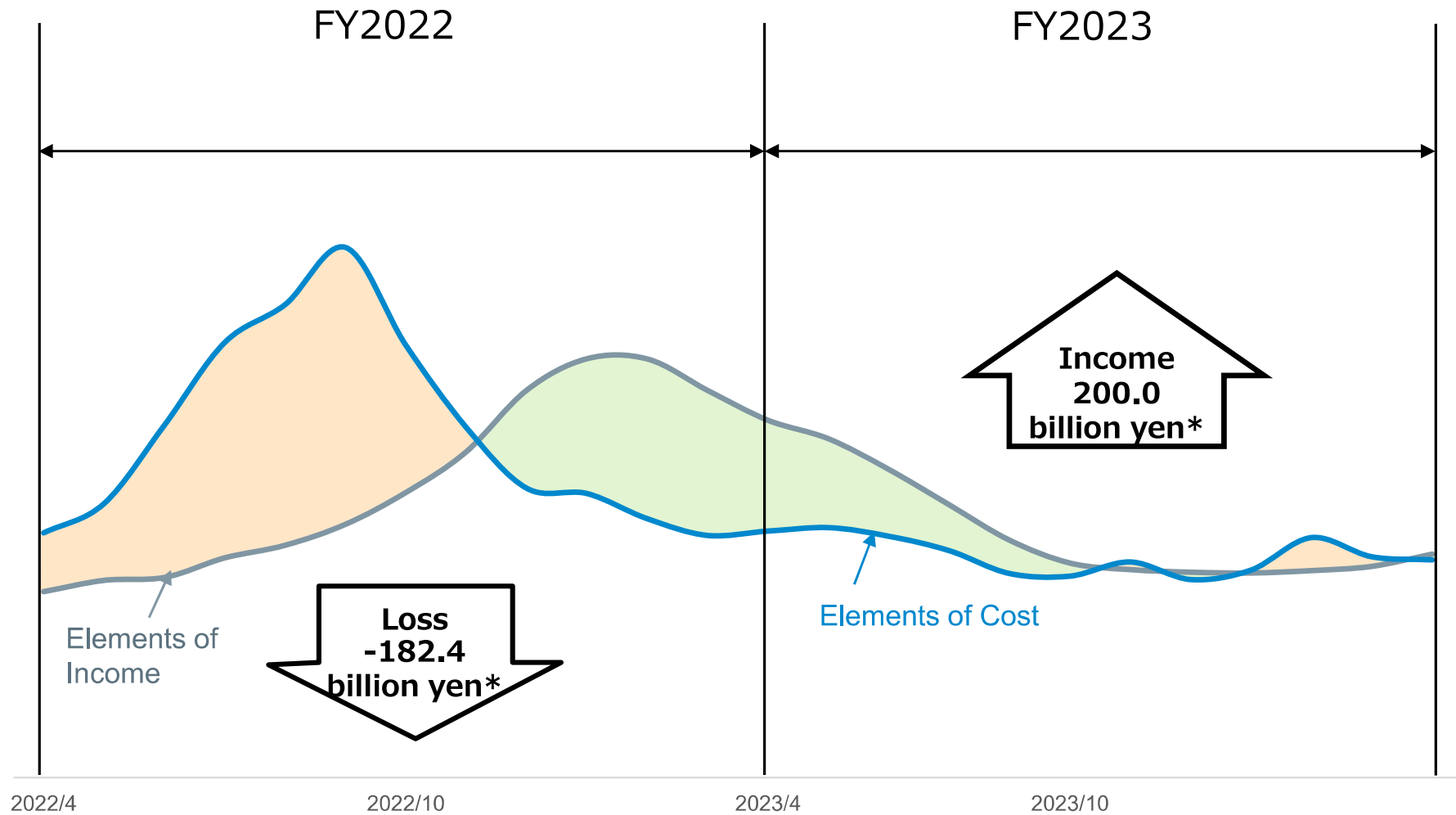
Image of Time Lag (2022/3Q – 2023/3Q)

- Time lag is profits and losses due to the time difference between changes in fuel prices and their reflection in sales prices.
- The impact on profits and losses will be neutral in the medium to long term.



* Figures are after-tax amounts.

Image of Time Lag (FY2022 – FY2023)



* Figures are after-tax amounts.

Electrical Energy Sold and Electrical Power Generated

【Electrical Energy Sold(TWh)】

	Apr to Jun	Jul to Sep	Oct to Dec	Jan to Mar	Total
FY2023	48.1	67.3	58.2		173.6
FY2022	57.9	69.9	63.6	63.7	255.1

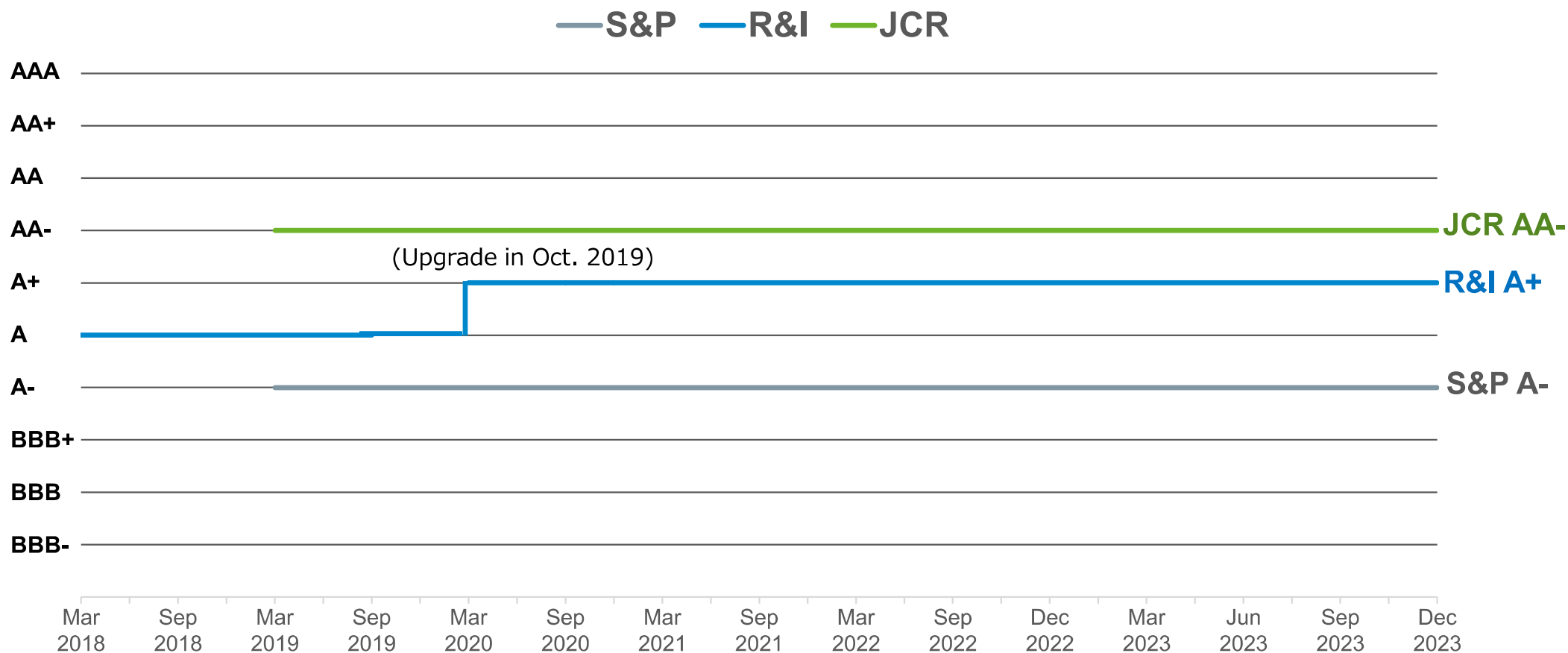
【Electrical Power Generated(TWh)】

		Apr to Jun	Jul to Sep	Oct to Dec	Jan to Mar	Total
FY2023		47.5	66.2	55.0		168.7
	LNG	36.2 (76%)	48.8 (74%)	41.7 (76%)		126.7 (75%)
	Coal	11.2 (24%)	17.2 (26%)	13.3 (24%)		41.8 (25%)
	Others	0 (0%)	0.1 (0%)	0 (0%)		0.2 (0%)
FY2022		52.8	63.5	58.0	60.8	235.1
	LNG	41.7 (79%)	47.0 (74%)	43.9 (76%)	45.8 (75%)	178.4 (76%)
	Coal	11.2 (21%)	16.5 (26%)	14.0 (24%)	15.0 (25%)	56.7 (24%)
	Others	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

*The total may not match due to rounding.



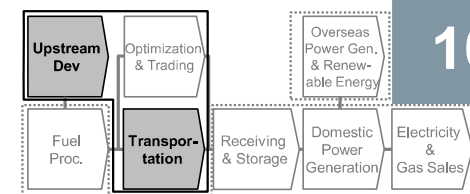
【 Issuer Credit ratings history 】



Reference:
**Overview and topics of
each segment**

Fuel Business:

Fuel Upstream / Transportation Business



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- Demand for LNG has increased in Europe and Asia as low-carbon energy. However, we participate in LNG upstream projects by leveraging one of the world's largest LNG transaction volume (FY2022: Approximately 35 million tons*) to achieve stable energy supply. We secure stable LNG sources by building portfolio which can diversify procurement risk as well as acquire the information related to procurement and the market trend.
- Additionally, We own fuel carriers that contribute to highly consistent, flexible, and competitive fuel supply.
- In June 2022, a fire incident occurs at the Freeport LNG terminal, shutting down operations at the terminal. In March 2023, regulatory approvals for resumption of production were obtained one by one. And production has resumed at all lines.

*1 JERA Group as a whole

Fuel Upstream Project

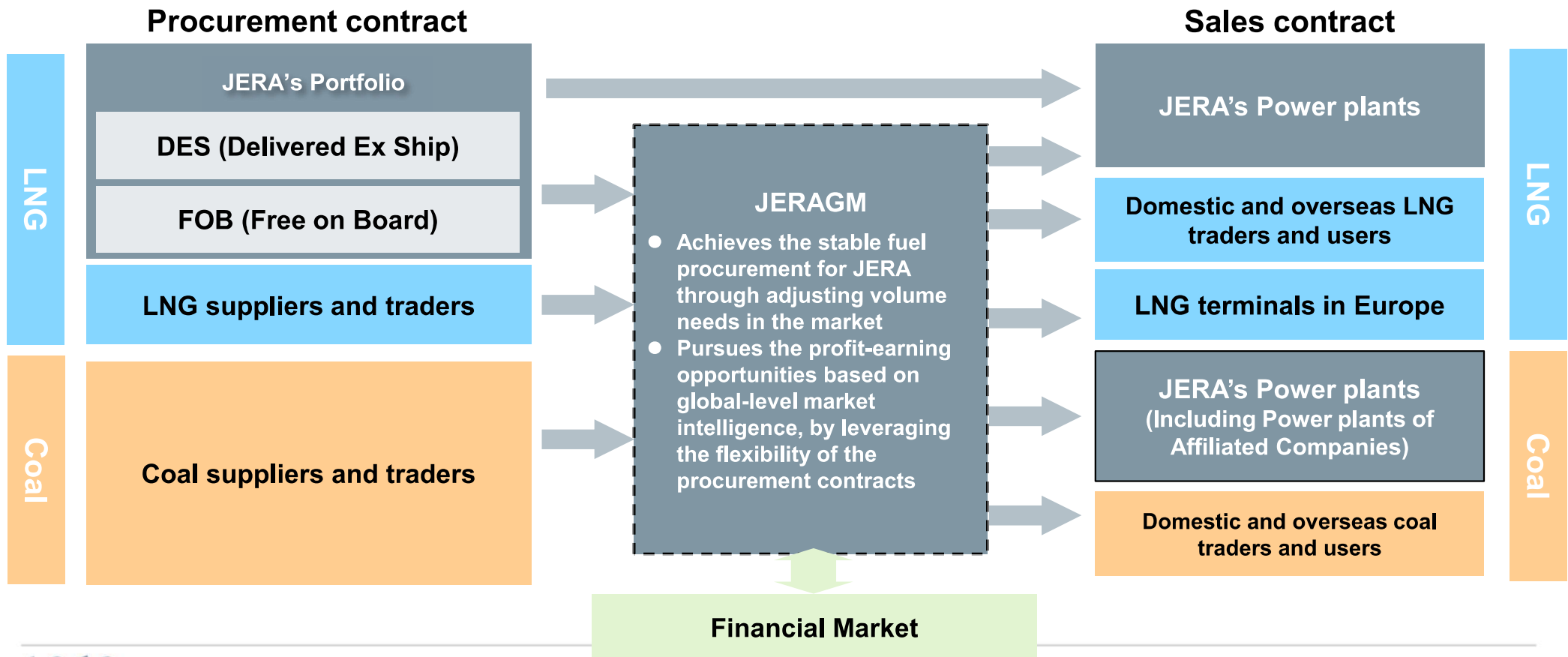
Project Name	Country	LNG Production / Liquefaction Capability	Investment Ratio*2
Darwin LNG Project	Australia	Approx. 3.7 million tons/year	6.132%
Gorgon LNG Project		Approx. 15.6 million tons/year	0.417%
Ichthys LNG Project		Approx. 8.9 million tons/year	0.735%
Wheatstone LNG Project		Approx. 8.9 million tons/year	Gas field: 10%, LNG plant: 8%
Barossa gas field Project		LNG production and liquefaction capacity is the same scale as Darwin LNG Project.	12.5%
Freeport LNG Project (Train1)	United States	Approx. 5.15 million tons/year	25%
Freeport LNG Development, L.P.*3		Approx. 15.45 million tons/year*4 for all three lines	25.7%

*2 The stake of Wheatstone LNG Project represents the ratio of shares held through PE Wheatstone in which JERA invests

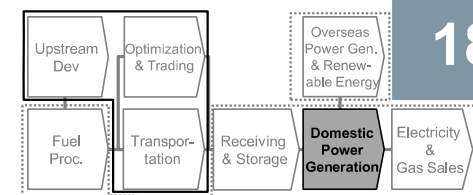
*3 Freeport LNG Project Management Company

*4 Including 5.15 million tons/year from Train 1

- In addition to the Singapore headquarters, JERAGM has offices in the United Kingdom, the Netherlands, the United States, and Japan, and holds approximately 300 employees who engage in asset-backed trading.
- Utilizing the global trading network, JERAGM supplies LNG and coal to JERA's domestic power generation business. Leveraging this commercial flow, JERAGM has been able to achieve both supply stability and the expansion of profits by efficiently capturing profit opportunities through transactions with markets and third parties.
- JERAGM trades within the limited volume under the governance of the Board of Directors elected by shareholders.

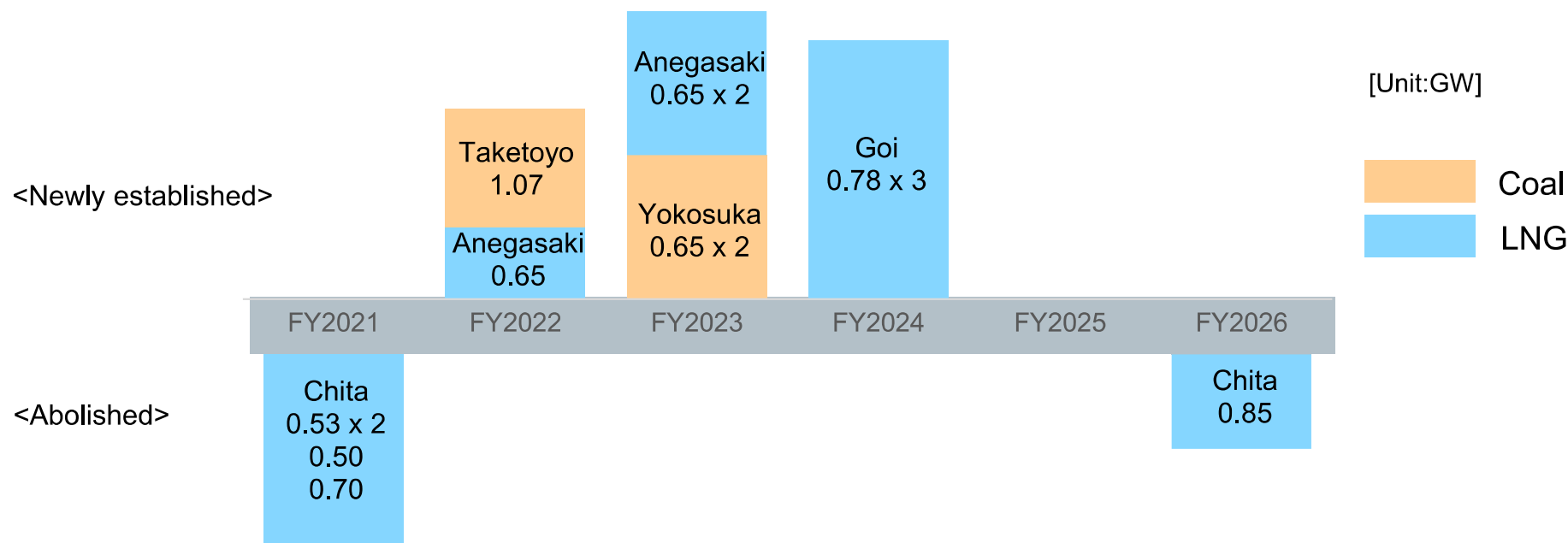


Domestic Thermal Power and Gas Business: Progress of Replacement of Thermal Power Plants in Japan



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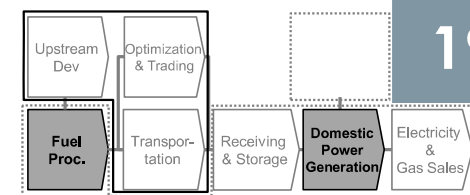
- We have been replacing with the latest high-efficiency thermal power generation facilities. Following Taketoyo and Anegasaki New Unit 1, Anegasaki New Unit 2 began commercial operation in April, Yokosuka Unit 1 in June, Anegasaki New Unit 3 in August 2023, and Yokosuka Unit 2 in December 2023.
- Construction and commissioning of Goi Unit 1 to 3 are well underway.
- Unit 1 to 4 of Chita were abolished in FY2021. Unit 5 is planned to be abolished in FY2026 and is being considered for replacement with the latest high-efficiency thermal power generation (environmental impact assessment has been conducted).



*As of December 31, 2023

Development Point	Status of Development
Goi	Full-scale construction started in April 2021. Construction progress: 96%

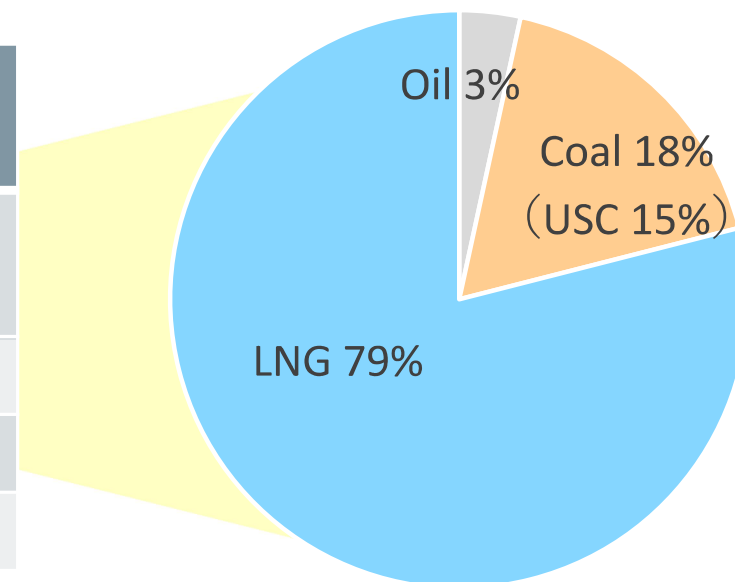
Domestic Thermal Power and Gas Business: Composition of Power Sources



- 76% of our power source is LNG, which has low CO₂ emissions.
- In coal, ultra super critical power generation system (USC), which emits comparatively small amount of CO₂, accounts for a large proportion. We will shut down all inefficient coal power plants by 2030^{*1}.

Composition of Power Sources^{*2}

Fuel	Capacity (Generator output)
Coal (USC)	10.32 GW (8.92 GW)
LNG ^{*3}	46.29 GW
Oil	2.00 GW
Total	58.61 GW



^{*1} Press release on October 13, 2020 “Towards Zero CO₂ Emissions in 2050”

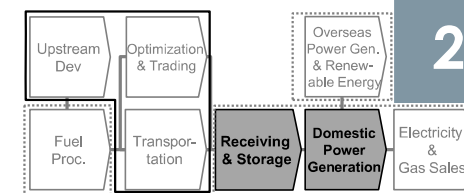
https://www.jera.co.jp/english/information/20201013_539

^{*2} As of December 31, 2023. Includes capacity under construction.
Excludes capacity of affiliates.

^{*3} Includes LPG and City Gas.

Domestic Thermal Power and Gas Business: Domestic Thermal Power Plants

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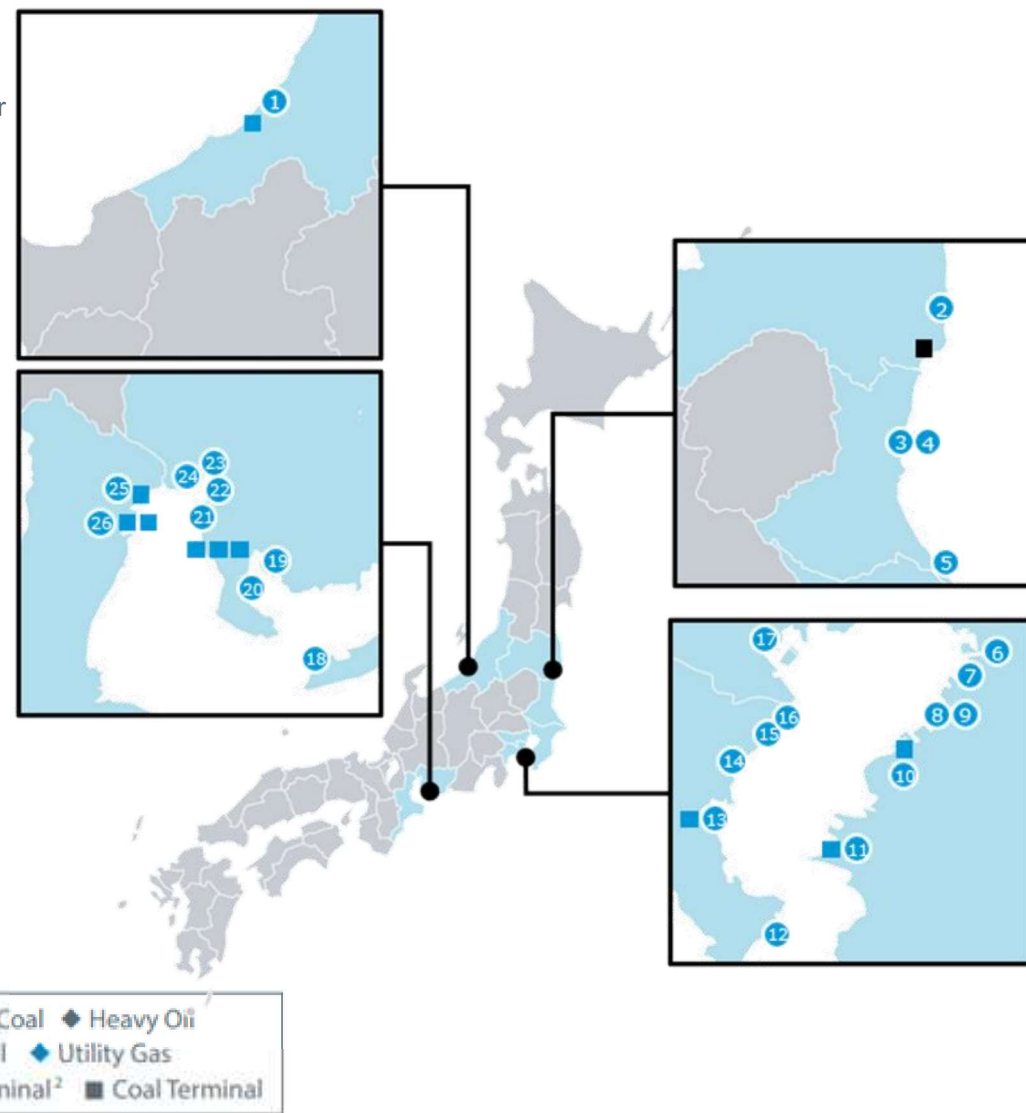


➤ We own nearly half of total thermal power generation capacity in Japan.

List of Thermal Power Plants in Japan¹

(Total output and fuel type listed for each thermal power plant)

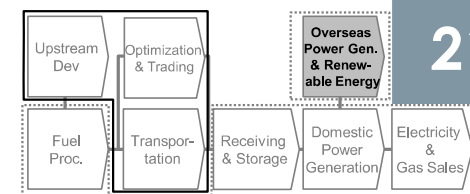
① Joetsu	2.38 GW	◆	As of December 31, 2023
② Hirono	1.80 GW	◆◆◆	
③ Hitachinaka	2.00 GW	◆	
④ Hitachinaka Kyodo <HITACHINAKA GENERATION>	0.65 GW	◆	
⑤ Kashima	1.26 GW	◆	
⑥ Chiba	4.38 GW	◆	
⑦ Goi <GOI UNITED GENERATION> *Scheduled to start operation in FY2024	2.34 GW	◆	
⑧ Anegasaki	1.20 GW	◆	
⑨ Anegasaki <JERA Power ANEGASAKI> *Started operation in August 2023	1.941 GW	◆	
⑩ Sodegaura	3.60 GW	◆	
⑪ Futtsu	5.16 GW	◆	
⑫ Yokosuka <JERA Power YOKOSUKA> *Started operation in December 2023	1.30 GW	◆	
⑬ Minami-Yokohama	1.15 GW	◆	
⑭ Yokohama	3.016 GW	◆	
⑮ Higashi-Ohgishima	2.00 GW	◆	
⑯ Kawasaki	3.42 GW	◆	
⑰ Shinagawa	1.14 GW	◆	
⑱ Atsumi	1.40 GW	◆◆	
⑲ Hekinan	4.10 GW	◆	
⑳ Taketoyo <JERA Power TAKETOYO> *Started operation in August 2022	1.07 GW	◆	
㉑ Chita	1.708 GW	◆	
㉒ Chita Daini	1.708 GW	◆	
㉓ Shin-Nagoya	3.058 GW	◆	
㉔ Nishi-Nagoya	2.376 GW	◆	
㉕ Kawagoe	4.802 GW	◆	
㉖ Yokkaichi	0.585 GW	◆	



¹ Power plant's name <Operator's name>

² Includes jointly operated terminals in the Chita and Yokkaichi areas

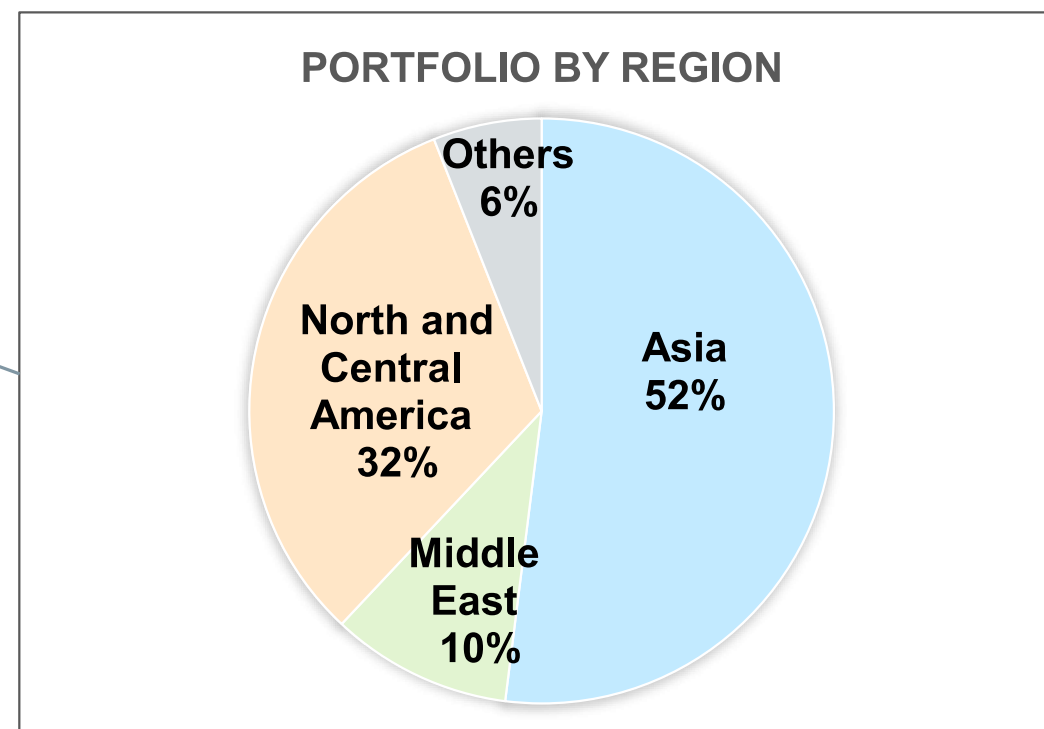
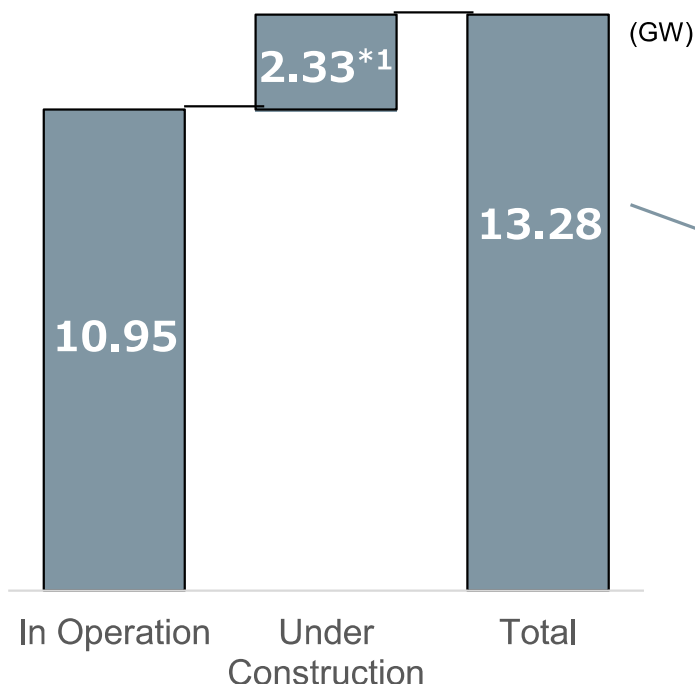
Overseas Power Generation and Renewable Energy Business: Portfolio of Overseas Power Generation and Renewable Energy Business



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- JERA is expanding its businesses through the experience gained from projects around the world. Total capacity of power generation in overseas projects is 13.28 GW (including under construction).
- JERA aims to secure funds and expand earnings by replacing its portfolio through the sale and reinvestment of assets to achieve an optimal asset structure in line with changes in the business.

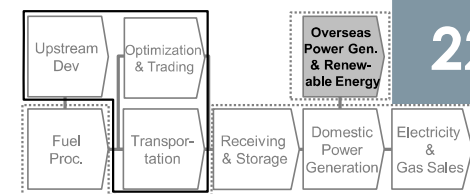
< Power Generation Capacity (As of December 2023) >



*1 As of the end of December, power generation capacity of Ishikari Bay New Port Offshore Wind Farm includes "Under Construction".

Overseas Power Generation and Renewable Energy Business:

List of Overseas Power Generation / Renewable Energy projects (1)



22

(As of December 31, 2023)

Investment on Platform Companies* *Companies participating in multiple power generation projects

Country	Project Name	Investment ratio	Capacity	Fuel type	Notes
Philippines	TeaM Energy IPP	25.0%~50.0%	2,341 MW	Coal	
	Aboitiz Power Corporation	27%	4,835 MW	Coal/Oil/Renewable	Including under construction
Thailand	EGCO Corporation	12.3%	6,888 MW	Coal/Gas/Renewable	Including under construction
Vietnam	Gia Lai Electricity Joint Stock Company	35.1%	503 MW	Solar/Wind/Hydro	Including under construction
India	ReNew Company	7.3%	13,756 MW	Solar/Wind/Hydro	Including under construction
Bangladesh	Summit Power IPP	22.0%	1,883 MW	Gas	Including under construction
Japan	Green Power Investment	5.46%	N/A	Offshore Wind	*1
United Kingdom	Zenobe Battery Storage	7.06%	431 MW	-	Including under construction
Belgium	Parkwind	100.0%	600 MW	Offshore Wind	Including under construction

*1 The capacity only includes the offshore wind projects that JERA has agreed with other shareholders to utilize its management assets

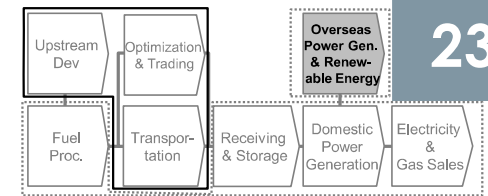
Power Generation / Renewable Energy Projects(1/2)

Japan	Solar	100.0%	14.6 MW	Solar	Including under construction
	Ishikari Bay New Port Offshore Wind Farm	100.0%*2	112 MW	Offshore Wind	Under construction*3
Taiwan	Chang Bin/Fong Der/Star Buck Gas Thermal IPP	19.5%~22.7%	3,060 MW	Gas	Including under construction
	Formosa 1 Offshore Wind IPP	32.5%	128 MW	Offshore Wind	
	Formosa 2 Offshore Wind IPP	49.0%	376 MW	Offshore Wind	
Vietnam	Phu My Gas Thermal IPP	15.6%	715 MW	Gas	
Indonesia	Cirebon2 Coal Thermal IPP	10.0%	1,000 MW	Coal	

*2 This is actual investment ratio added direct investment by JERA and indirect investment through GPI. *3 Commercial operation started on 1 January 2024.

Overseas Power Generation and Renewable Energy Business:

List of Overseas Power Generation / Renewable Energy projects (2)



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(As of December 31, 2023)

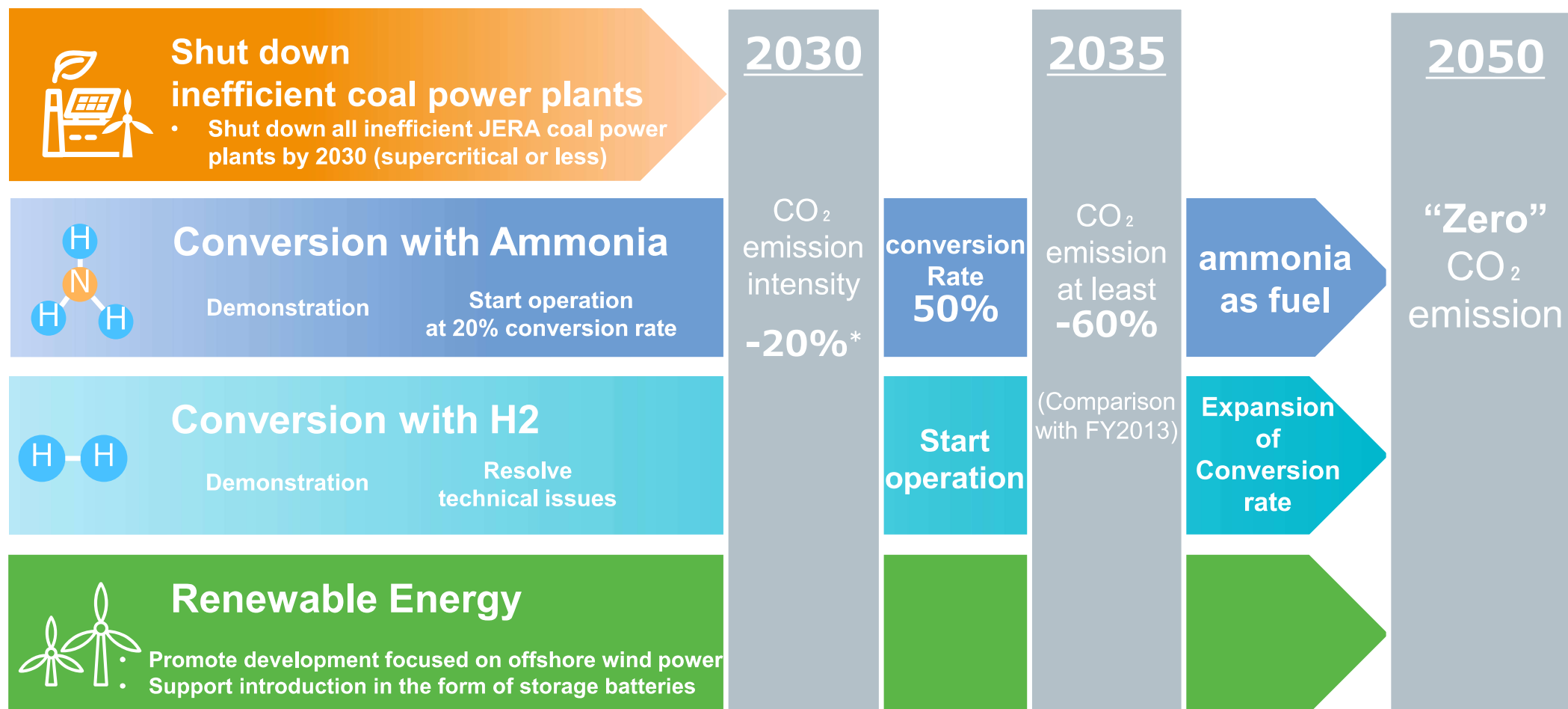
Power Generation / Renewable Energy Projects(2/2)					
Country	Project Name	Investment ratio	Capacity	Fuel type	Notes
Thailand	Ratchaburi Gas Power Thermal IPP	15.0%	1,400 MW	Gas	
	Solar Power IPP	49.0%	31 MW	Solar	
	Wind Power IPP	5.0%	180 MW	Onshore Wind	
Bangladesh	Meghnaghat Gas Thermal IPP	49.0%	718 MW	Gas	Under construction
UAE	Umm Al Nar Gas Thermal IWPP	20.0%	1,550 MW	Gas	
Qatar	Ras Laffan B Gas Thermal IWPP	5.0%	1,025 MW	Gas	
	Ras Laffan C Gas Thermal IWPP	5.0%	2,730 MW	Gas	
	Mesaieed Gas Thermal IPP	10.0%	2,007 MW	Gas	
	Umm Al Houl Gas Thermal IWPP	10.0%	2,520 MW	Gas	
Oman	Sur Gas Thermal IPP	19.5%	2,000 MW	Gas	
Mexico	Valladolid Gas Thermal IPP	50.0%	525 MW	Gas	
United States	Tenaska Gas Thermal IPP	11.1%~17.5%	2,950 MW	Gas	
	Carroll County Gas Thermal IPP	20.0%	702 MW	Gas	
	Cricket Valley Gas Thermal IPP	38.0%	1,100 MW	Gas	
	Linden Gas Thermal IPP	50.0%	972 MW	Gas	
	Compass Gas Thermal IPP	50.0%	1,123 MW	Gas	
	Brady Thermal IPP	100.0%	1,633 MW	Oil/Gas	
	El Sauz Onshore Wind IPP	100.0%	302 MW	Onshore Wind	Under construction
United Kingdom	Gunfleet Sands Offshore Wind IPP	25.0%	173 MW	Offshore Wind	

**Reference:
Progress of
JERA Zero CO₂ Emissions 2050**

JERA Zero CO₂ Emissions 2050: Roadmap for its Business in Japan

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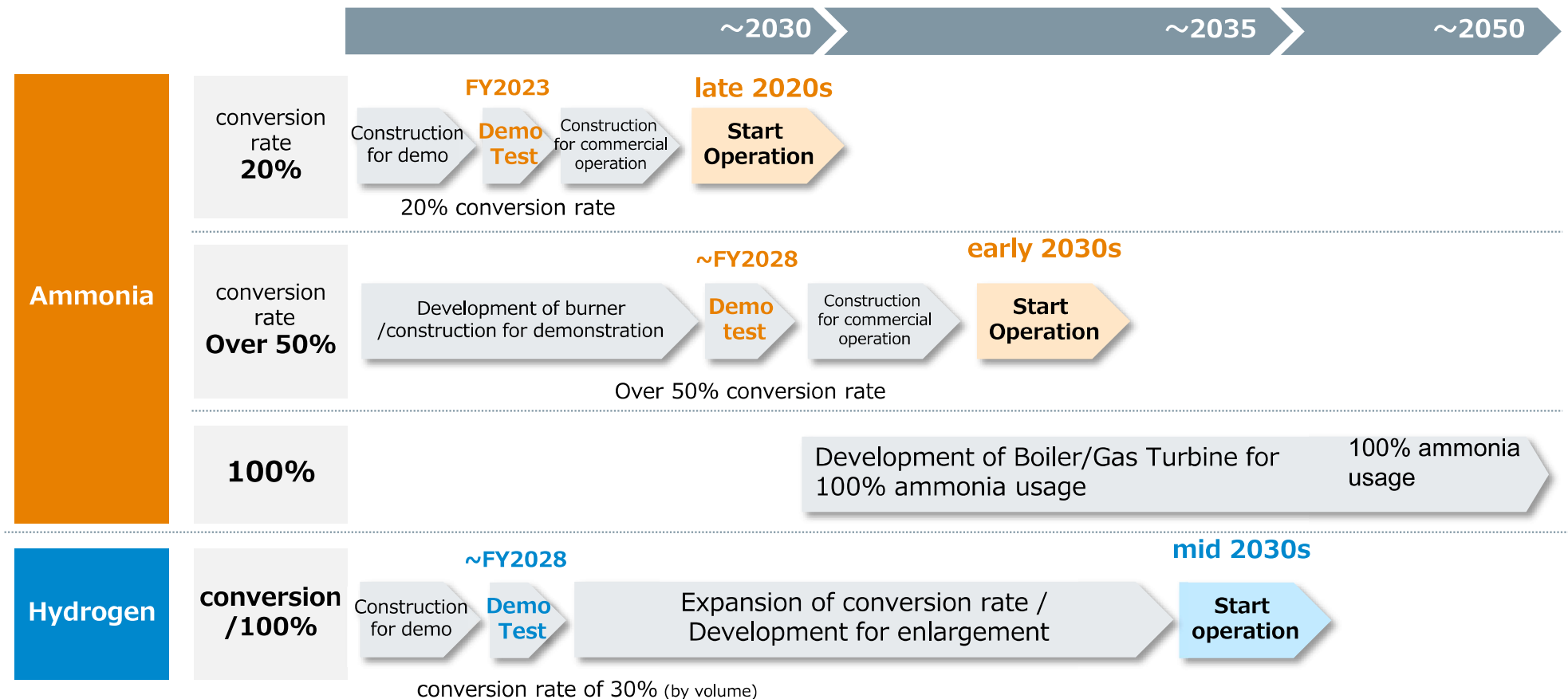
- JERA established “JERA Zero CO₂ Emissions 2050 Roadmap for its Business in Japan”, including four initiatives.



*Reduce carbon emission intensity of thermal power plants by 20% based on the long-term energy supply-demand outlook for FY2030 as set by the government

JERA's decarbonization technologies development timeline

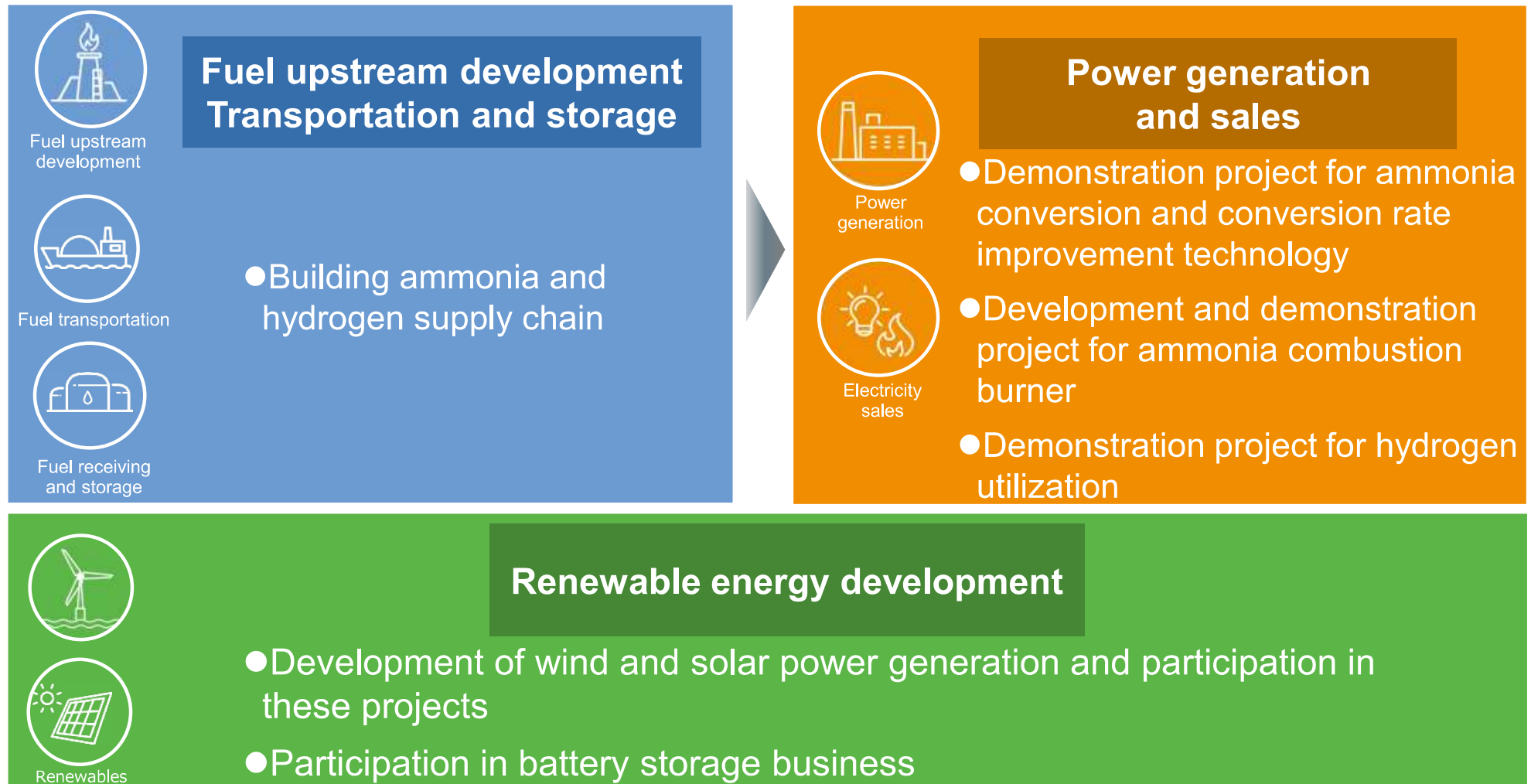
- The facility construction will be completed in February 2024 for the demonstration test of ammonia 20% conversion rate (by calorie) in Hekinan power plant Unit 4 in FY2023. Demonstration test of over 50% conversion rate will be conducted by FY2028 at Hekinan Unit 5. After the demo tests, commercial operation will start at the power plants.
- Demonstration test of hydrogen 30% conversion rate (by volume) using JERA's Gas turbine CC unit will be conducted by FY2028 targeting commercial operation in the mid 2030s.



JERA Zero CO2 Emissions 2050:

Efforts to Achieve Zero CO2 Emissions in JERA's Value Chain

- JERA is participating in business throughout the value chains, from fuel upstream development, transportation, and storage and to the power generation and electricity sales. We are working with many countries and companies around the world to achieve zero emissions at each stage.



Efforts towards Zero CO2 Emissions (Ammonia and Hydrogen Supply Chain)

(Announced in the last one year)

Field		Business Partners	Contents	Date	
Upstream Development /Production		ADNOC (UAE)	Consideration of cooperation in the fields of clean hydrogen and ammonia	2023/7	
		PIF (Saudi Arabia)	Consideration of opportunities for the development including green hydrogen production	2023/7	
		TAQA (UAE)	Consideration of project development in the area of decarbonization, including green hydrogen and ammonia production	2023/2	
		CF Industries (United States) Yara (Norway)	Consideration of project development for blue ammonia production and sales & purchase of clean ammonia	2023/1	
		Chevron (United States)	Consideration of collaboration on multiple lower carbon opportunities in Asia Pacific region (Australia) and the United States	2022/11	
Transportation		Nippon Yusen / Mitsui O.S.K. Lines	Consideration of transporting fuel ammonia for the Hekinan Thermal Power Plant	2022/11	
Power Supply / Utilization	Japan	Kyushu Electric Power	signed a MOU concerning comprehensive discussions on collaboration aimed at achieving decarbonization and a stable supply of energy supply	2023/10	
		Kyushu Electric Power Chugoku Electric Power Shikoku Electric Power Tohoku Electric Power Hokuriku Electric Power Hokkaido Electric Power Okinawa Electric Power	Consideration of cooperation in the adoption of hydrogen and ammonia as fuel for power generation	2022/11 ~ 2023/12	
		Mitsui	Signed an Ammonia Sales and Purchase Agreement for its use in the demonstration project at the Hekinan Thermal Power Station	2023/6	
		Yamanashi prefecture	Conclusion of a Basic Agreement on Building the Hydrogen Energy Society of the Future: Building a Regional Hydrogen Value Chain	2023/11	
		NYK Line, Resonac	The Launch of a Joint Study Aimed at Achieving the World's First-Ever Supply of Fuel Ammonia to Ships	2023/12	
		Europe	Uniper (Germany)	Signed a Heads of Agreement for the sale of low carbon hydrogen/ammonia produced in the US	2023/9
			EnBW / VNG (Germany)	Consideration of the development of ammonia cracking technology for hydrogen production	2023/6
	Asia	EVN (Vietnam)	Signed a MOU that commits the collaboration to establish a decarbonization roadmap for EVN	2023/10	
		PPT (Thailand)	Consideration of collaboration on initiatives for expanding the supply chain and usage of hydrogen and ammonia towards decarbonization in Thailand	2023/5	
		Aboitiz Power (Philippines)	Consideration of cooperation in studies to decarbonize business and conversion using ammonia at a coal-fired power plant	2023/2	
		EGCO (Thailand)	Consideration of cooperation in conversion using ammonia towards decarbonization	2023/1	
		IHI Asia Pacific (Singapore)	Consideration of collaboration on the expansion of ammonia usage in Malaysia	2022/10	
		PT Pertamina (Persero)	Joint collaboration in building infrastructure LNG and hydrogen/ammonia and so on	2023/12	
R&D (NEDO's Project)		NIPPON SHOKUBAI Chiyoda Corporation	Development of large-scale ammonia cracking catalyst and technology	2023/6	
		ENEOS	Construction of hydrogen quality standard system for industrial utilization	2023/6	

JERA Zero CO2 Emissions 2050: Efforts towards Zero CO2 Emission(Power Generation)

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Initiatives for Ammonia Conversion

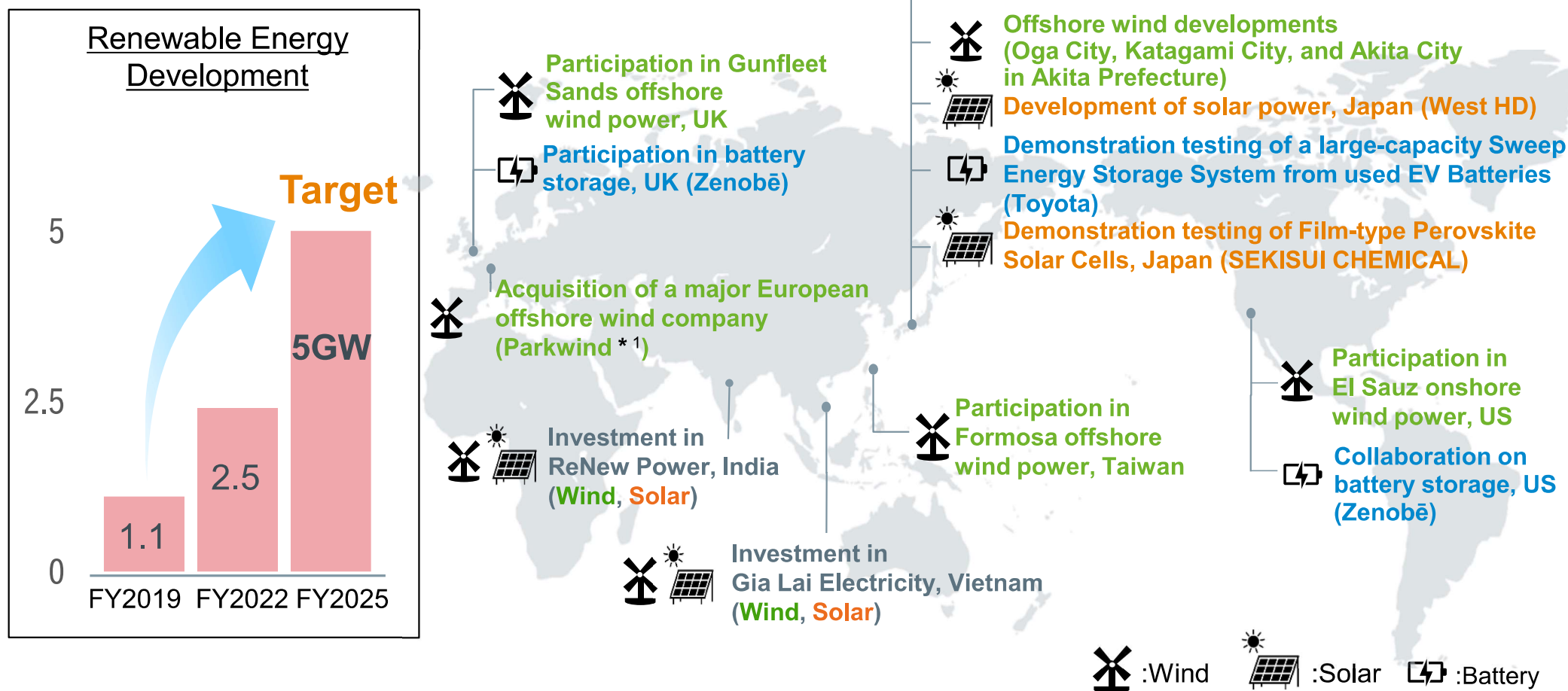
- The following projects have been adopted by NEDO and are currently being implemented.

Project	Development of technologies for carbon recycling and next-generation thermal power generation / Research, development and demonstration of ammonia conversion technologies for thermal power generation	Green Innovation Fund Program / Establishment of Fuel Ammonia Supply Chains project / Demonstration project to develop technology to increase the ammonia conversion rate at coal-fired boilers
Overview	- At Hekinan Thermal Power Station Unit 4 (power output: 1 million kW), JERA will start electricity generation of 20% ammonia conversion by FY2023. - In addition, small-scale tests using burners of different materials was conducted at Unit 5 of Hekinan Thermal Power Station (power output: 1 million kW).  Hekinan Thermal Power Station	- Ammonia high conversion burners will be implemented in Hekinan Thermal Power Station Units 4 or 5, with the aim of increasing the ammonia conversion rate to 50% or more. - JERA will plan to develop a burner capable of 50% or more ammonia conversion by FY2023, and to start 50% or more ammonia conversion in actual equipment by FY2028. - JERA will plan to develop an ammonia-fired burner suitable for coal boilers and to demonstrate its operation with actual equipment. - We have the plan to develop the burner that can exclusively burn ammonia by FY2024, and verify that two units of different boiler types can convert to ammonia more than 50% by FY2028.

Initiatives for Hydrogen Conversion

- Received notice of acceptance of “Demonstration project related to hydrogen utilization at an LNG thermal power plant in Japan” under Green Innovation Fund program lead by NEDO, and conducted evaluation of operational and environmental characteristics for hydrogen utilization at existing LNG thermal power plants in Japan from FY2021 to FY2028.
- At Linden Gas Thermal Power Station Unit 6 in the United States, electricity generation started by the partly replacement of natural gas with hydrogen-containing off-gas generated at the adjacent oil refinery.

- JERA has set a target of 5GW renewable energy development by FY2025, and is widely promoting wind power, solar power, battery storage, etc.



*1 Parkwind's equity generation capacity in operation and under construction is 0.6GW.

*2 JERA's equity generation capacity is approximately 0.11GW.

Actions for Domestic Offshore Wind Power Generation

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- JERA selected as business operators for an offshore wind power project off Oga city, Katagami city, and Akita city in Akita prefecture on 13th December 2023.

Oga, Katagami, and Akita Offshore Green Energy Consortium

Interconnection Capacity	315MW
Number of Units	21 units
Turbine Model	Vestas V236-15MW
Planned Start of Commercial Operation	June 2028



<Map of Sea Areas>

- JERA acquired shares of Green Power Investment Corporation on 3rd August 2023. On 1 January 2024, Ishikari Bay New Port Offshore Wind Farm held by JERA and GPI began in its operation.

Ishikari Bay New Port Offshore Wind Farm

Interconnection Capacity	112 MW
Number of Units	14 units
Turbine Model	Siemens Gamesa 8MW
Start of Commercial Operation	1st January 2024



<Turbine Generator Installation>