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Keppel Offshore & Marine

Disclaimer

This release may contain forward-looking statements which are subject to risks and uncertainties that could cause actual results to differ materially from such statements. Such risks and uncertainties include industry and economic conditions, competition, and legal, governmental and regulatory changes. The forward-looking statements reflect the current views of Management on future trends and developments.

The Keppel Group

Providing solutions for sustainable urbanisation

Offshore & Marine



- New builds
  - Offshore
  - Gas & specialised vessels
- Conversions & repairs

Property



- Property development
- Investments

Infrastructure



- Energy & environmental related infrastructure
- Logistics & data centres
- Investments

Investments



- Asset management
  - Property & infrastructure trusts
  - Private funds
- Investments

Keppel Offshore & Marine

Offshore



Leading designer, builder and repairer of high-performance mobile offshore drilling rigs

Ship Repair & Conversion



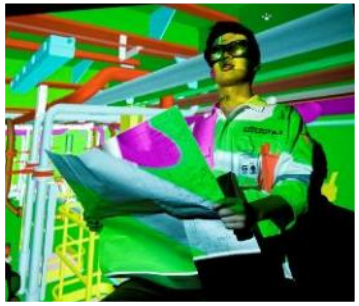
Trusted industry name for repair, conversion and upgrade for a diverse range of ships

Specialised Shipbuilding



Designer and builder of a wide spectrum of highly specialised ships for global customers

Technology



Design and engineer market-relevant and commercially viable solutions for all frontiers

Maintaining Executional Excellence

Major Deliveries in 2017



BW Catcher
FPSO completion and integration



Heydar Aliyev
Newbuild Semisubmersible drilling rig



John Agyekum Kufour
FPSO conversion



Hilli Episeyo
FLNGV conversion

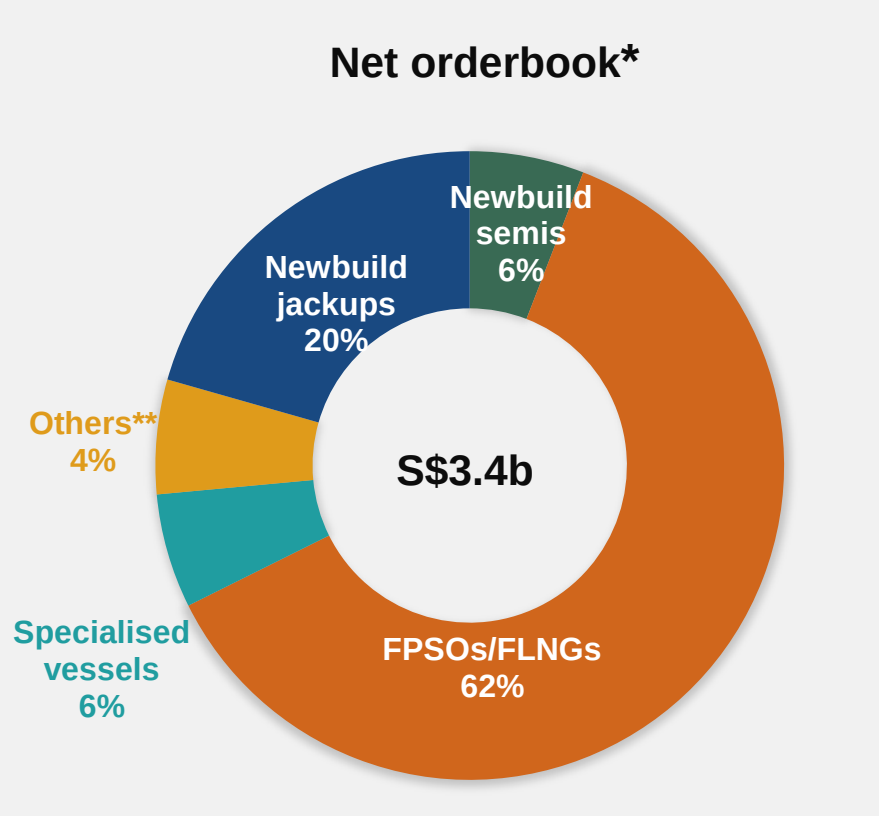


MPV Everest
Newbuild Ice class vessel



Khankendi
Newbuild Subsea Construction Vessel

Keppel's Order Backlog



- Order backlog at end-Aug 2017 includes
  - 17 newbuild jackup rigs
  - 9 FPSO/FLNG projects
  - One ice-class MPV
  - One Subsea Construction Vessel
  - Four dredgers
  - Two dual fuel tugs
  - Two LNG carriers
  - Two LNG fueled containerships
- Contract wins year-to-date include four conversion/repair projects, one TLWP project, one dredger, two LNG carriers, two LNG containerships

* As of end-June 2017 and excludes semis for Sete
** *Includes modification, upgrading, fabrication and rig repairs*

Capturing Near Market, Near Customer Opportunities



Keppel Offshore & Marine

Delivering Customised Solutions to Azerbaijan

- Recently delivered Heydar Aliyev, the first modern semisubmersible to be almost completely built in Azerbaijan
  - Fabrication, integration, testing and commissioning completed in Azerbaijan; Fabrication of columns in Singapore
- Subsea Construction Vessel (SCV) completed
  - Bow block construction, integration and commissioning work done in Baku; Design, fabrication and outfitting works carried out in Singapore



DSS™38M semi, Heydar Aliyev



SCV Khankendi for Caspian Sea

Gulf of Mexico and US Jones Act market

- Keppel AmFELS enters Jones Act market to build two LNG-fuelled containerships
  - Enhanced yard facilities to undertake shipbuilding
  - Replacement cycle for the aging Jones Act fleet to meet environmental regulations

- Mexico's energy reforms expected to increase production and lead to a more robust energy sector

LNG-fuelled containership for Pasha Hawaii



Cantarell I and II operating in Mexico



Reliable Partner in Brazil

- BrasFELS is currently undertaking P-69 for Petrobras
- P-66 achieved first oil in May 2017 in the Lula Sul field, Santos Basin, Brazil
- Since 2010, BrasFELS has completed eight FPSO projects
- Steady stream of repair jobs:
  - Upgrade on semisubmersible Olinda Star and well-intervention vessel Siem Helix in 1H 2017



FPSO P-66

Strengthening Capabilities in China

- Strengthened capabilities in Keppel Nantong to provide strong support for Keppel O&M's projects
- Undertaking three Trailing Suction Hopper Dredgers and two small-scale LNG carriers



Trailing Suction Hopper Dredger



Small-scale LNG carrier

Serving the Middle East market

- Saudi Aramco reportedly looking to buy at least 20 jackups
- Keppel LeTourneau in UAE providing end-to-end jackup rig solutions, including rig kits as well as aftersales and aftermarket services
- Opportunities for liftboats for life extension work and upgrading of pipelines in the Middle East
- Nakilat-Keppel Offshore & Marine (N-KOM) delivered first liftboat to GDI last year
- N-KOM continues to service the robust LNG market in Qatar



Al Safliya liftboat

Industry Headwinds

- Uncertainty in oil and gas market despite oil price recovery
- Cautious approach by E&P companies
- Oversupply in jackup rig market
- Limited impact of OPEC production cuts
- Opportunities exist in the oil and gas and adjacent markets
  - Increase need for production units
  - Global push for cleaner energy such as Gas and Renewables will require offshore infrastructure and assets

Optimising Operations & Harnessing Synergies

Reorganised to Optimise Synergies

New Builds

Conversions & Repairs

Offshore

Gas & Specialised Shipbuilding

Repair & Conversion







New Builds Division

- Integrating and executing key functions, such as engineering, procurement and operations

Conversions & Repairs Division

- Drawing on Group's extensive resources to undertake a wider variety of complex projects

Optimise operations through centralised functions

Harness synergies to offer more comprehensive solutions

Improving Productivity

- **Automation**
  - Robotic technology
- **Process improvements**
  - Methodology
- **Innovation**
  - Safety and equipment
- **3D Printing**
  - Studying material qualification
  - Print-on-demand
  - 3D scan of vessel internals



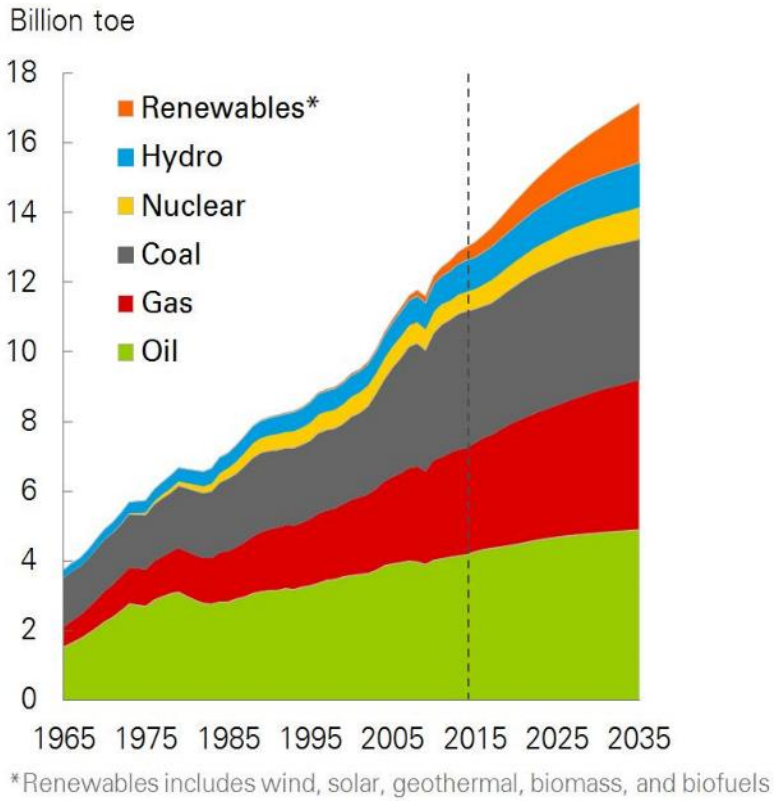




Solutions Provider in the Energy Market

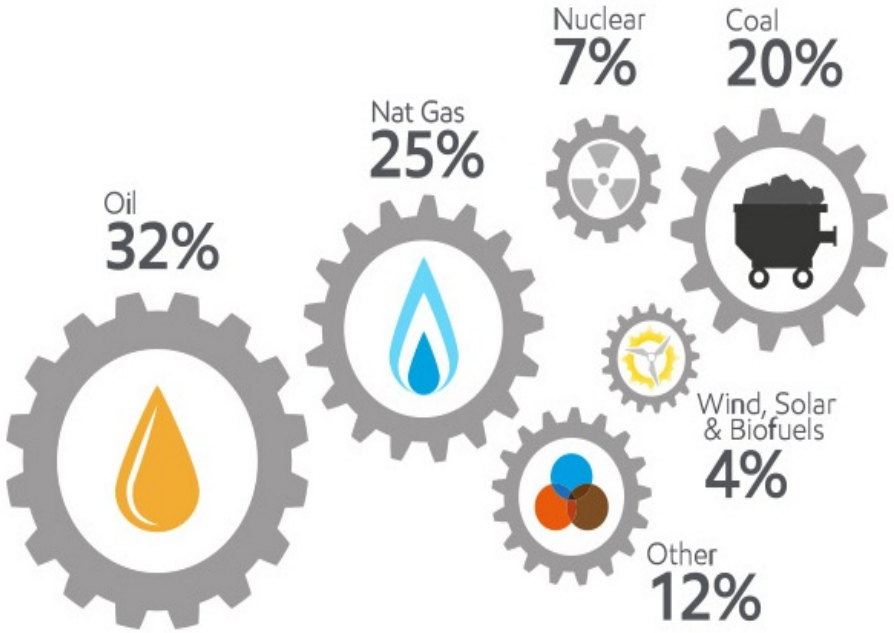
Long Term Energy Future

Primary energy consumption by fuel



BP Energy Outlook
2017

In 2040, the projected energy mix will be:



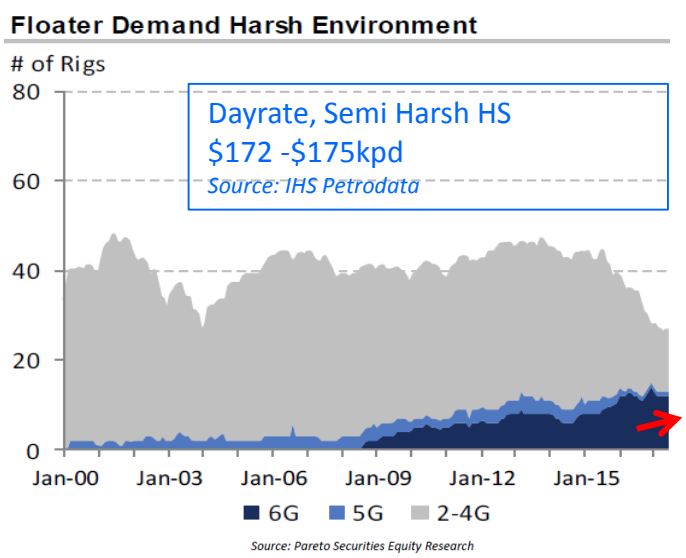
ExxonMobil

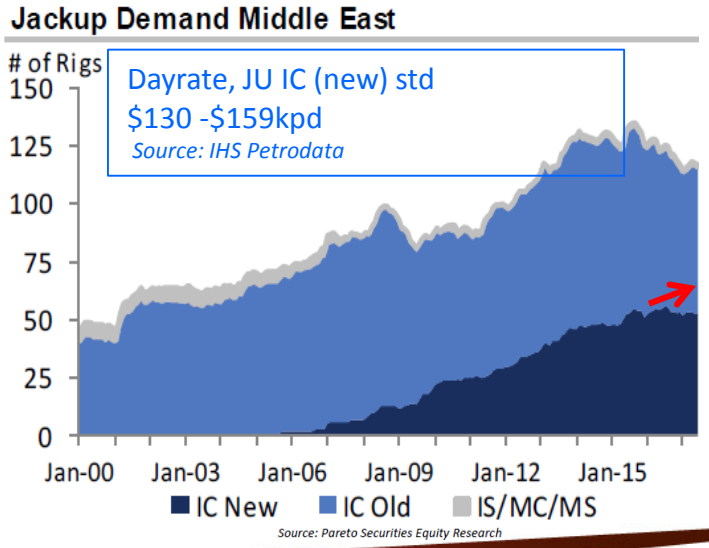
Solutions Provider in the Energy market

- **Rigs**
  - Jackups and floaters for all environments
  - Aftermarket and aftersales services
- **Floating Production**
  - FPSO Conversions and New Builds
  - Next generation semisubmersibles, TLPs and MOPUs
- **Gas solutions across the value chain**
  - FLNG / FSRU / LNG Carriers / PreNex cooling / LNG-fuelled vessels
- **Renewables**
  - Offshore wind
  - Tidal wave
  - Power projects

Drilling Rig Market

- **Opportunities in certain markets**
- **Increased activity in the resale jackup market**
  - Sale of Transocean jackups to Borr Drilling
  - Demand for high spec reliable rigs like the KFELS B Class
- **40% of harsh environment and mid-water rigs > 26 years old**





Floating Production Market

- FPU market could see between 83 -168 orders over next five years with a mid-case forecast of $86 billion to be spent on 119 units*

- **Key selection considerations for FPU projects**
  - Strong project management
  - Track record
  - Cost-efficiency
  - Contractors to undertake complete EPC
  - Low execution risk

** 2017-2021 Floating Production Systems Outlook Report, Energy Maritime Associates (EMA)*

Floating Production Market

- **Floating Production Storage and Offloading Vessels**
  - Undertake complex conversions with expanded scope to include enhanced engineering, procurement, topsides construction and full commissioning capabilities
  - Able to undertake newbuild FPSOs



BW Catcher - FPSO Hull and marine systems completion and topsides integration



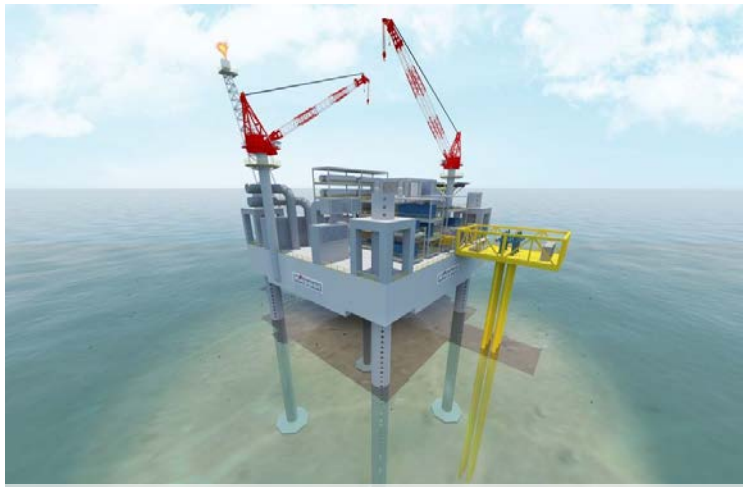
Armada Olombendo – one of the world's largest FPSOs

Floating Production Market

- **Newbuild Production Semisubmersibles**
  - Customised
  - Deepwater
- **Tension Leg Wellhead Platform (TLWP)**
  - Proven Keppel FloaTEC designs
  - Ca Rong Do in Vietnam
    - Hull and mooring engineering, Topsides basic engineering; Construction management support
- **Mobile Offshore Production Unit (MOPU)**
  - Cost-effective; Quick to market
  - Innovative solution that removes the need for fixed platforms



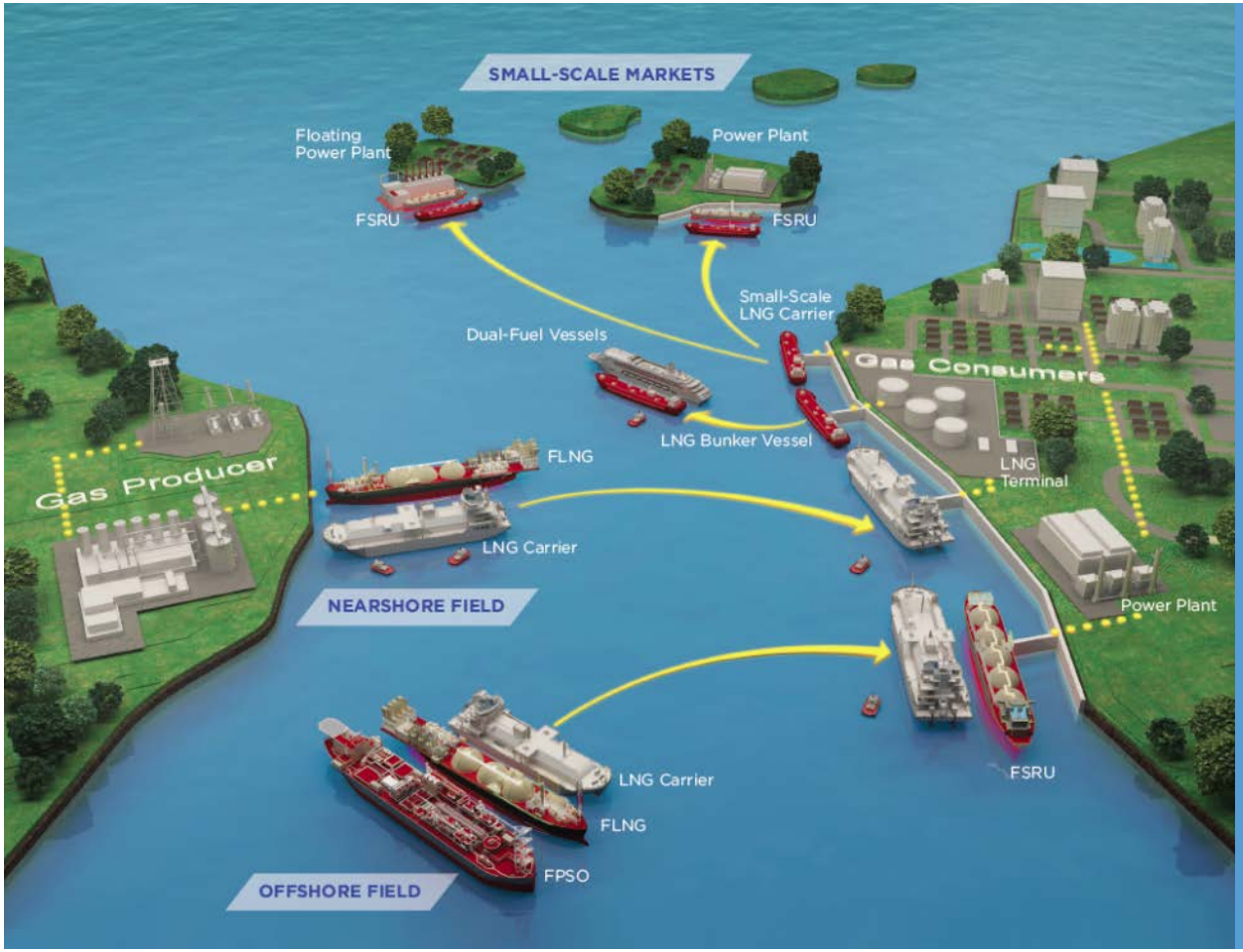
P-61 TLP for Brazil



Keppel's High Spec MOPU design

Providing Solutions Across the Gas Value Chain

Gas Industry Partner & Enabler



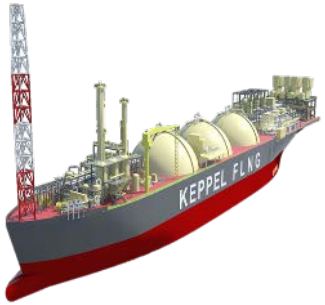
Keppel designs, develops and integrates solutions for the seamless delivery of LNG across the gas value chain

Empowering Gas Delivery

Keppel is well-positioned to meet emerging trends in the gas market with a suite of innovative solutions catering to the entire value chain.

Upstream | Midstream | Downstream

Gas to LNG | **LNG to Users** | **LNG to Gas** | **Gas to Power** | **Gas as Fuel**











Liquefaction

FLNG

Conventional LNG

FSRU | FSU | FRU | FSRP

Small Scale LNG

Carriers | FSRU | Power Barge

LNG for Transport

Bunker Barge | Gas-fuelled Vessel

Keppel Offshore & Marine

World's First FLNGV Conversion

- Converted Floating Liquefied Natural Gas Vessels (FLNGV) enable rapid and lower-cost monetisation of marginal and stranded gas fields
- Innovative concept - Added sponsons to provide 8000 sqm additional deck space to accommodate a 20,000 MT process topside and supporting utilities
- Safe, functionally-optimised, ergonomic
- Complies with regulations and clients operational preferences



Hilli Episeyo FLNGV

Gas Industry Partner & Enabler

Keppel provides innovative gas solutions, integrating them across the value chain to bring LNG from producers to consumers

Liquefaction

Head start with Golar Hilli

- *Achieved FID at low oil prices*
- *Established upstream & midstream partners, offtake from oil major*
- *Replicable, scalable solution for further offshore*
- *Patent obtained for liquefaction technology*

Track Record

Keppel's Track Record

- *World's leader in FSRU, FSU Conversions*
- *One-stop EPC solutions provider*
- *Collaboration with Moss Maritime for regasification solution*
- *Conversion reduces time-to-market, and increases responsiveness*

Small Scale LNG to Power

Integrating and enabling end-to-end solutions

- *Ability to stitch up value chain with key partners to meet demand for small-scale LNG markets*
- *Proprietary ship and regasification designs*

LNG for Transport

Total Solutions Provider

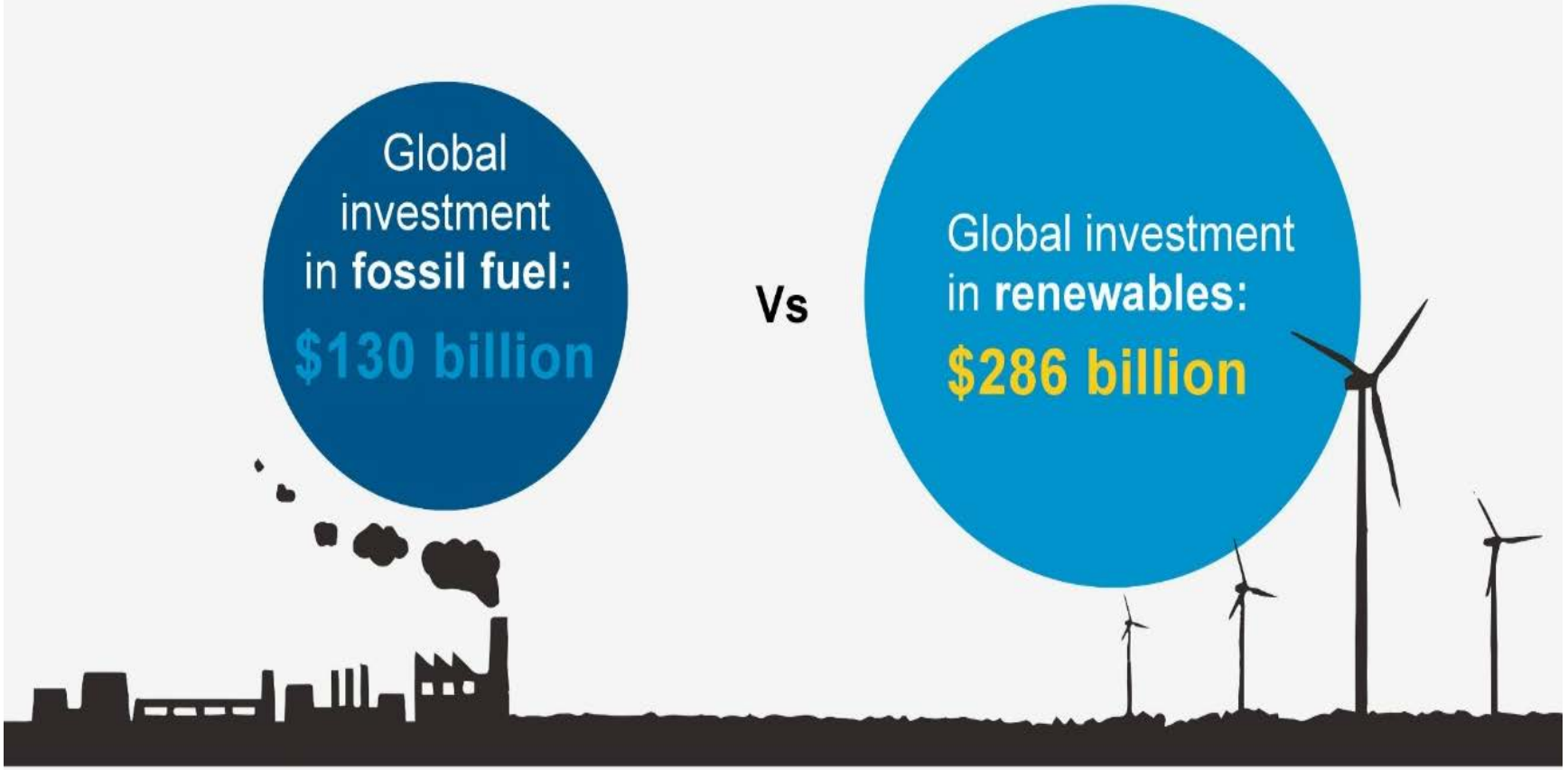
- *Keppel is implementing a reliable LNG bunkering supply chain*
- *Well-placed to provide secure and economical LNG to end users*

Keppel signed HOA to provide small scale LNG solutions for West Indonesia

Increasing Focus on Renewables

Increasing Focus on Renewables

Renewables attracted more than double the $130 billion committed to new coal and gas generation.



(Data source: Frankfurt School-UNEP Centre / BNEF Global Trends in Renewable Energy Investment 2016)

Increasing Focus on Renewables



Wind Energy



Ocean Energy

DONG Energy to sell oil, gas business to Ineos for $1.3 billion

Shell Plans to Boost Clean Energy Spending to $1 Billion per Year

Exxon, Shell, Total, Statoil renew clean energy drive

Offshore Wind Market

Record installation of renewable power capacity worldwide in 2016 of 138.5GW, from 127.5GW in 2015

- UK's offshore wind sector could power a £17.5bn investment in the UK economy over the next four years[1]

- Offshore wind farm costs in UK fall to less than half of two years ago



1. http://www.telegraph.co.uk/business/2017/09/11/offshore-wind-power-175bn-investment-boom-costs-halve/

Full Suite of Offshore Wind Support Solutions





INSTALLATION VESSELS

- Multipurpose Self Elevating Platform
- ORCA Liftboat designs



OFFSHORE SUBSTATIONS



FOUNDATION SOLUTIONS

- Jackets
- Monopiles
- Floaters

Diverse Specialised Products

Diverse Specialised Products

- **Marine and Offshore support**
  - LNG-fuelled containerships
  - Subsea construction vessels
  - Pipelay vessels
  - Cable laying vessels
  - Ice-class vessels



Ice-breakers Toboy and Varandey

- **Offshore Installation and Construction**
  - Liftboats
  - Dredgers

- **Offshore Infrastructure**
  - Power barge / vessels
  - Floating data centre
  - Offshore aquaculture facility

Specialised Vessels

- **Enhanced Energy Efficient Platform Supply Vessel**
  - Improved hull form for greater fuel-efficiency
  - DC grid system design



EEE PSV

- **Hybrid Tugs**
  - LNG + Battery for greater fuel efficiency



Hybrid Tug

- **Ice-class Vessels**
  - Multipurpose vessels and ice-breakers

Specialised Vessels

- **LNG Containerships**
  - Proprietary Greenmax 2525TEU design
  - Customised using CFD for optimum length and power
  - State-of-the-art hull form and underwater propulsion system
  - LNG propulsion systems to reduce environmental impact for Tier III Compliance



Customised LNG Containership

- **Dredgers**
  - Building world's first EU Stage V dredger


Dredger for Jan De Nul

- **Subsea Construction Vessels**
- **Pipelay Vessels**
- **Cable Laying Vessels**

Specialised Vessels

- **Liftboats**
  - Keppel's Orca design - more functional and versatile than traditional liftboats

- **Single / Dual Fuel Floating Power Barges**
  - Enhanced efficiency
  - High maneuverability
  - Continuous power generation with redundancy



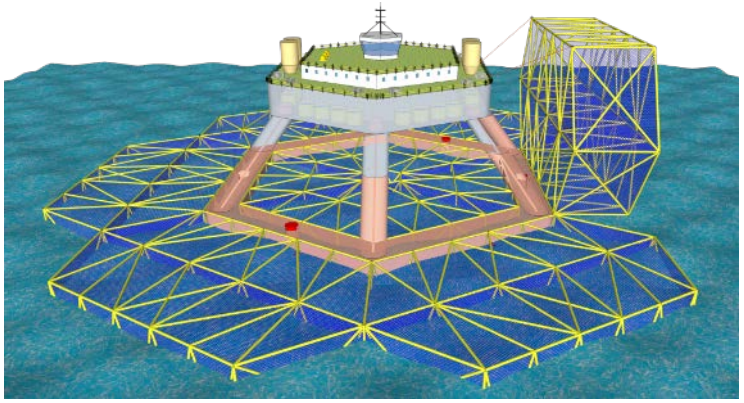
Floating Power Barge



Liftboat – Orca design

Repurposing Offshore Technology

- Floating Desalination Plant
- Floating Data Centre
- Aquaculture (Offshore Fish Farm)
- Offshore Logistics Hub



Offshore Aquaculture Facility



Floating Data Centre

***We** aim to anchor our position as the trusted and preferred solutions partner in the offshore & marine industry by seizing opportunities to build and grow our businesses.*

Thank you
Q&As