

Fueling Growth, Empowering Delivery

Briefing to Analysts on Keppel's Gas Strategy

3 July 2017

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

Keppel meets the world's sustainable urbanisation needs through key businesses in Offshore & Marine, Property, Infrastructure and Investments

Offshore & Marine



- Rig design & construction
- Vessel conversion & repair
- Gas solutions & specialised vessels

Property



- Property development
- Investments

Infrastructure



- Energy & environmental infrastructure
- Infrastructure services
- Logistics & data centres

Investments

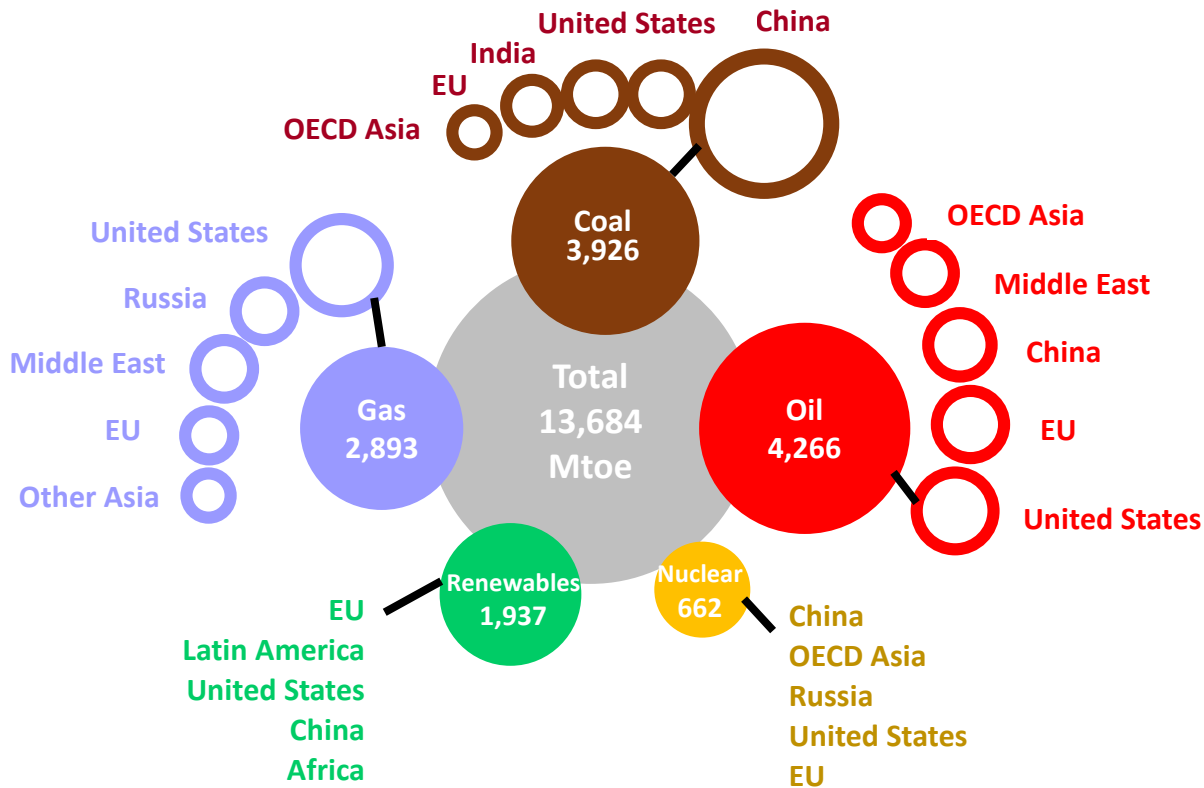


- Asset management
- Investments

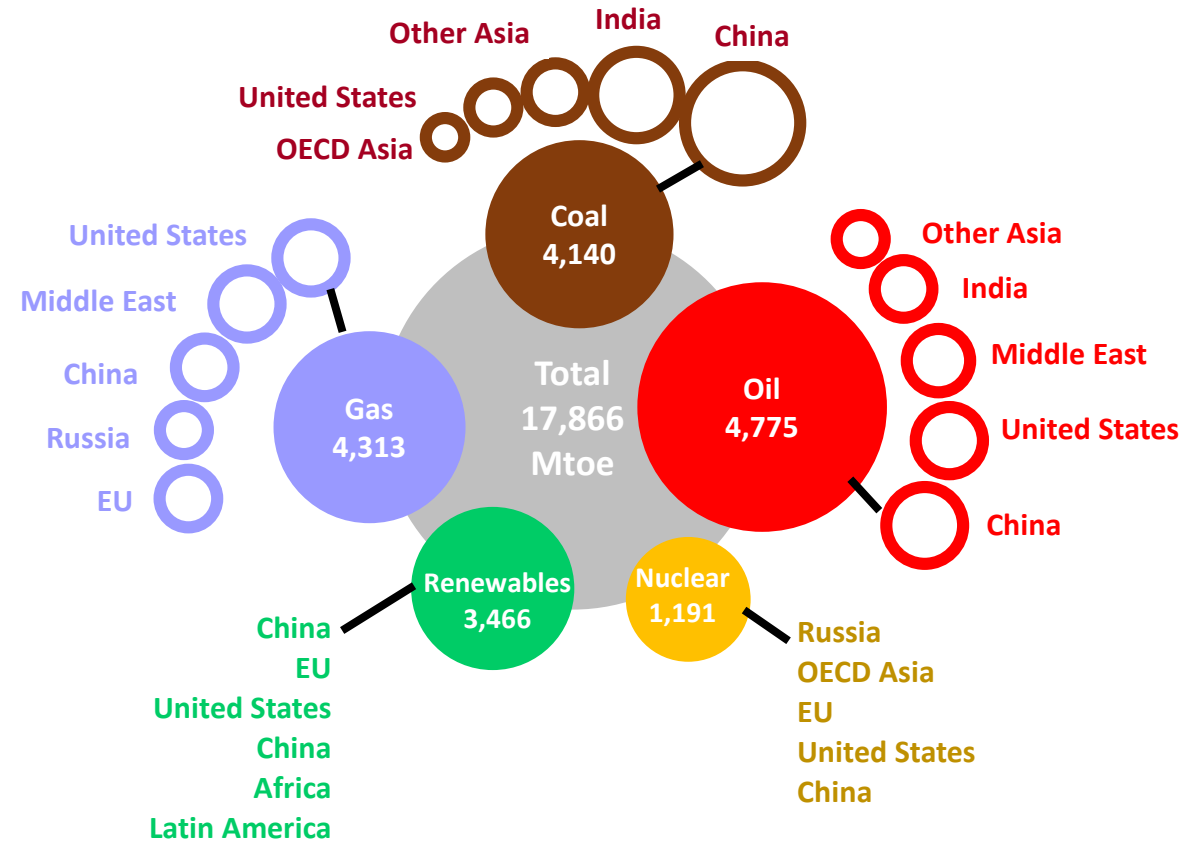
The Shift Towards Gas

World's Energy Mix

2014



2040



Natural Gas: Energy for the Future



ABUNDANT

- **85% of world's gas resources remain untapped²**
- Enough gas supply for 200 yrs²
- Gas prices expected to remain low in the long run



SUSTAINABLE

- **60% less carbon** compared to coal
- **20% less carbon** compared to oil
- Does not contain SOX nor NOX



TRANSPORTABLE

- **Liquefaction reduces gas volume by 600x.**
- Cryogenic boiling point of -160°C
- **Expertise needed** for safe & efficient gas conversion, storage and delivery

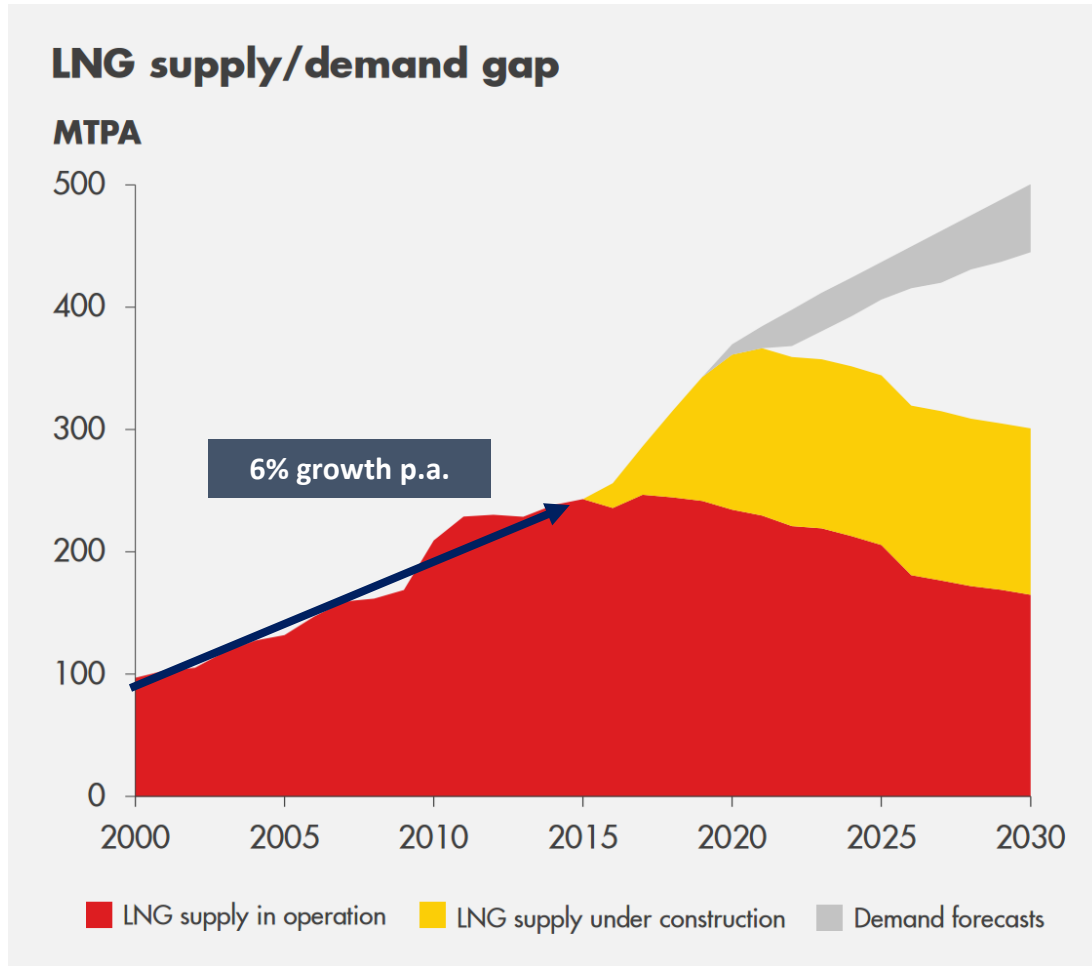


TRADABLE

- 1959: 1st LNG ship
- Share of LNG in gas trade:
2000: 24%
2016: **44%**
2040: estimated **53%**¹

Global Gas Outlook

New market drivers are emerging on the back of strong consumption growth. Sourcing for alternatives pipeline gas and coal remains a fundamental theme.



2016 : 265MTPA TRADED, VOLUMES TO DOUBLE BY 2030

Policymakers increasingly choose Gas

- China plans significant additional gas demand
- France & Canada join list of countries phasing out coal
- IMO's 2020 global sulphur cap for ships

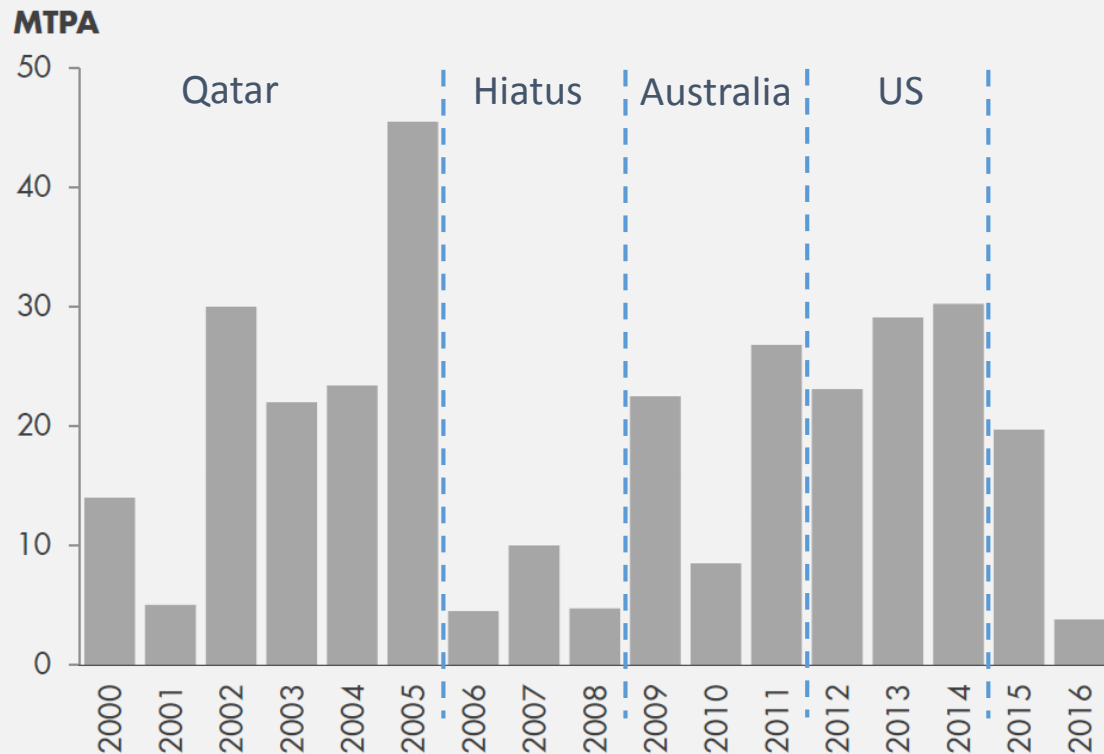
New market drivers are emerging

- Traditional exporters becoming importers
- Need to balance pipe gas purchases for energy security
- Growth in use of LNG for transport
- Rise of small scale gas markets

Global Gas Outlook

Slow down in LNG projects amidst low oil price and high cost environment will pressure supply, while changing landscape presents new challenges and opportunities.

Overview of LNG FIDs



2016 : ONLY 2 FIDs TOTALING 6.3MTPA

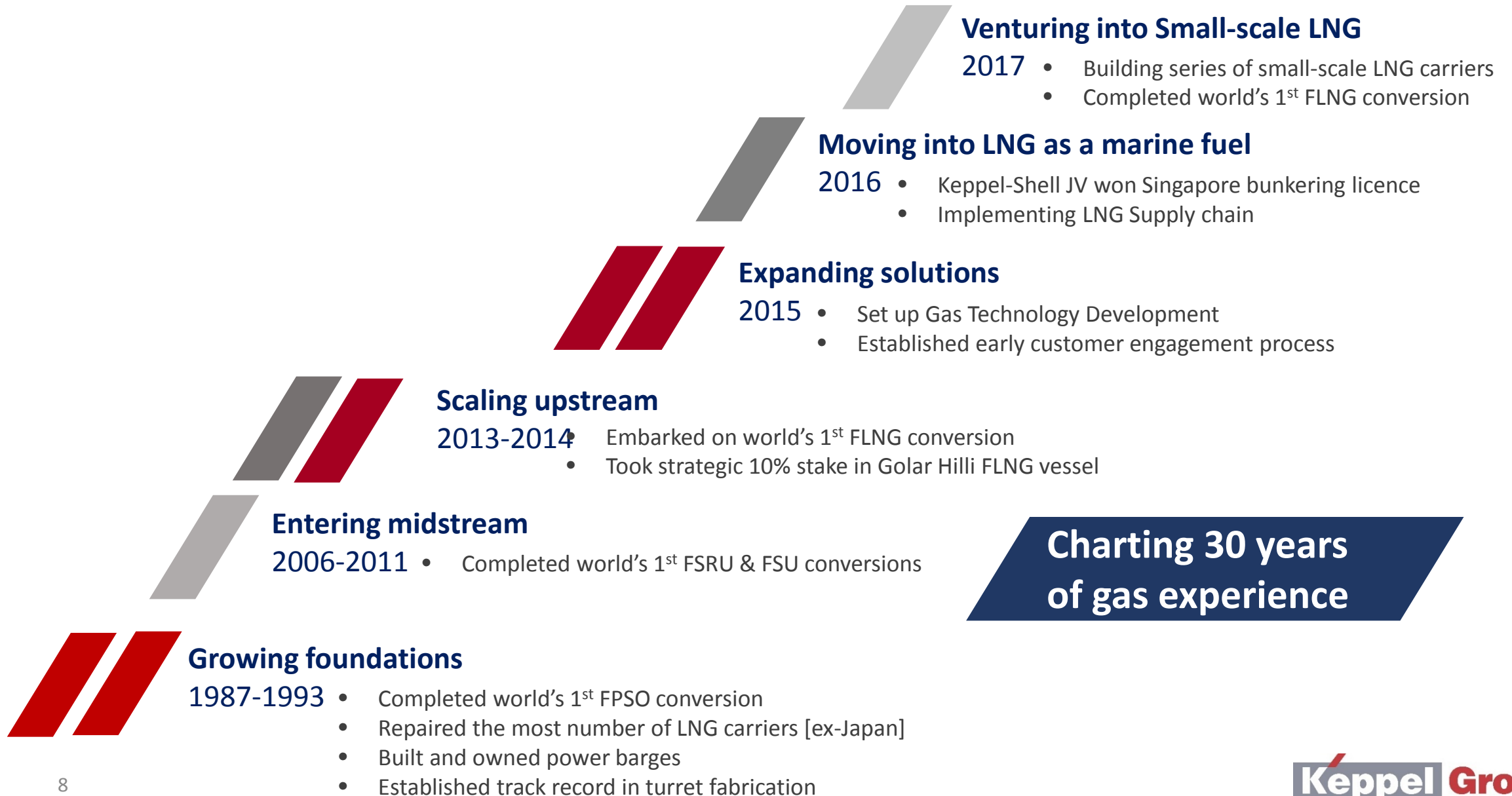
Market tightness expected over next decade

- Capital investment lowest since 2008
- IEA warns of underinvestment and energy complacency
- Additional liquefaction capacity required to meet rising demand after 2020

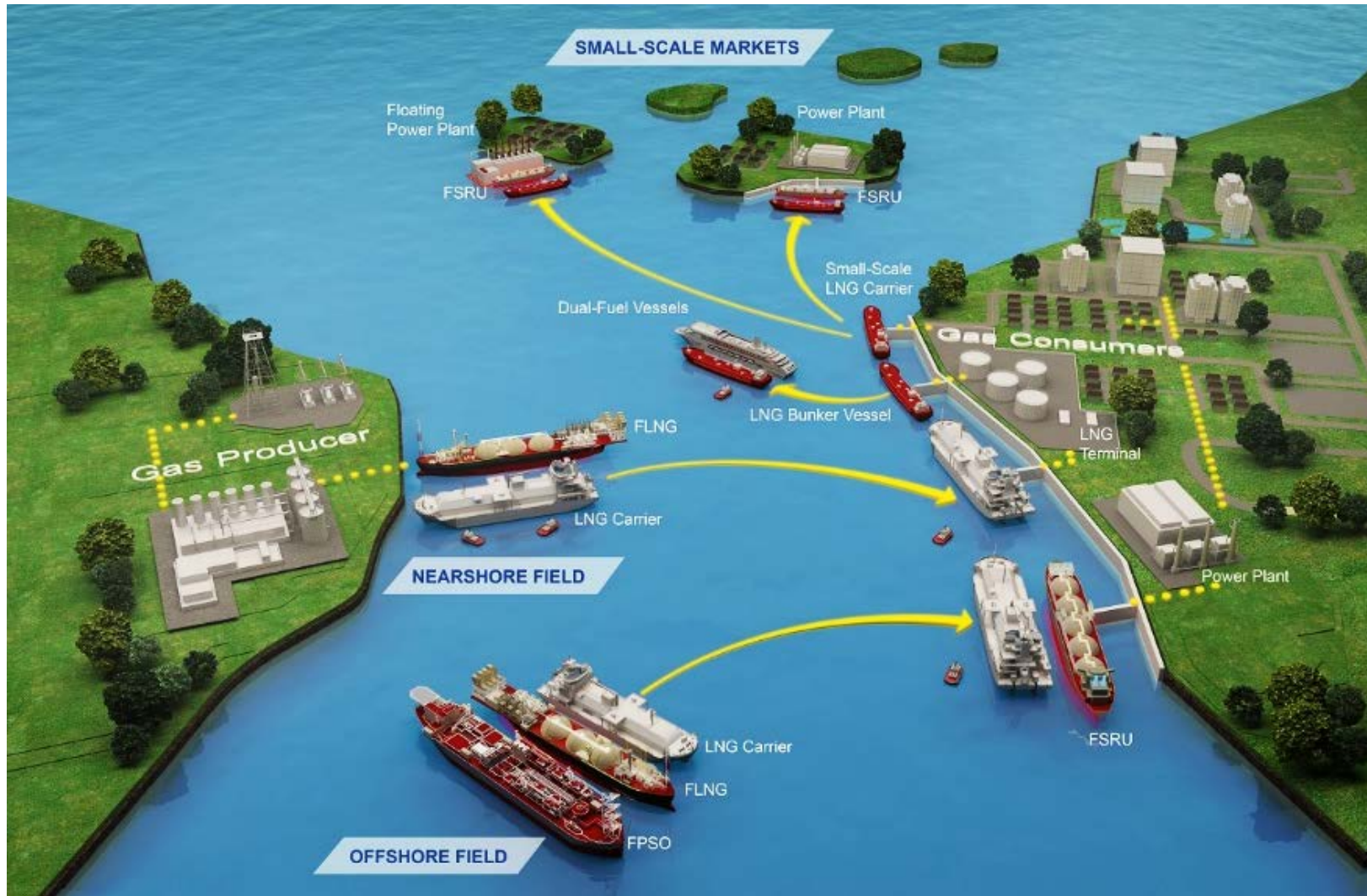
Opportunities for new cost-effective solutions

- Buyers are requiring enhanced contract flexibility
 - Shorter & smaller contracts
 - Destination flexibility

Keppel's Milestones in LNG



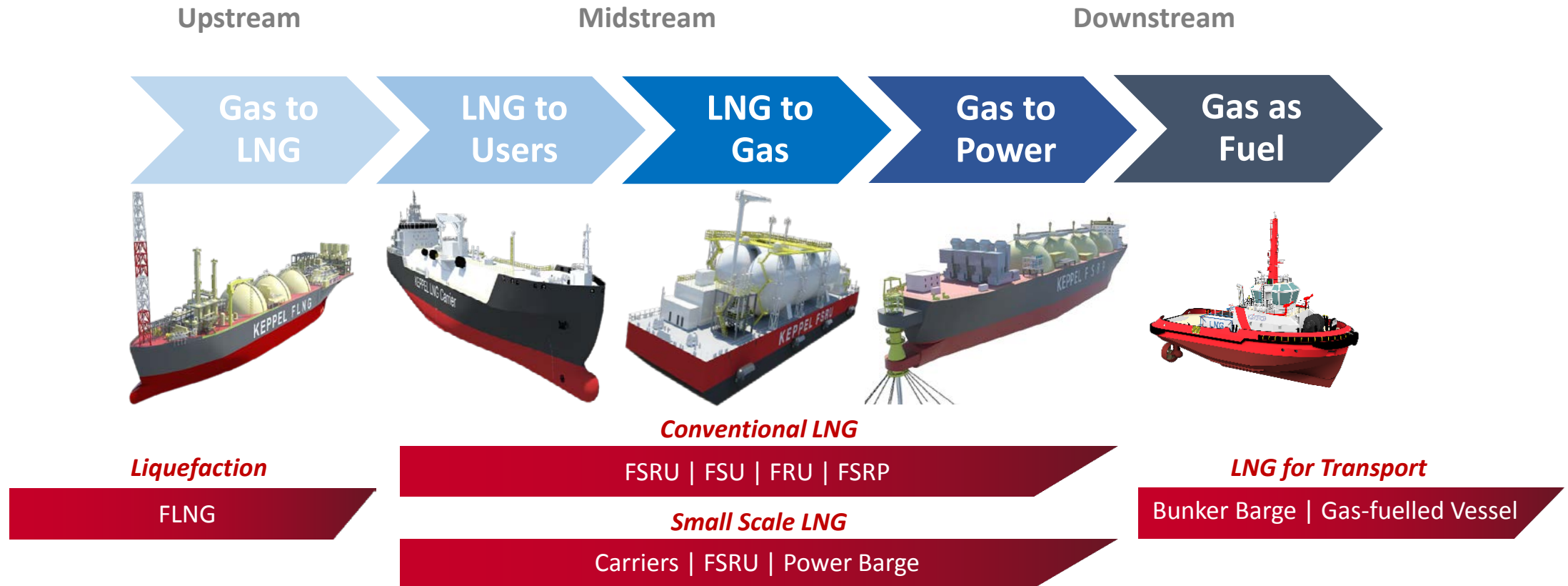
Keppel's Gas Value Chain



Integrating the gas value chain and providing solutions for the seamless delivery of LNG from end to end.

Empowering Gas Delivery

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

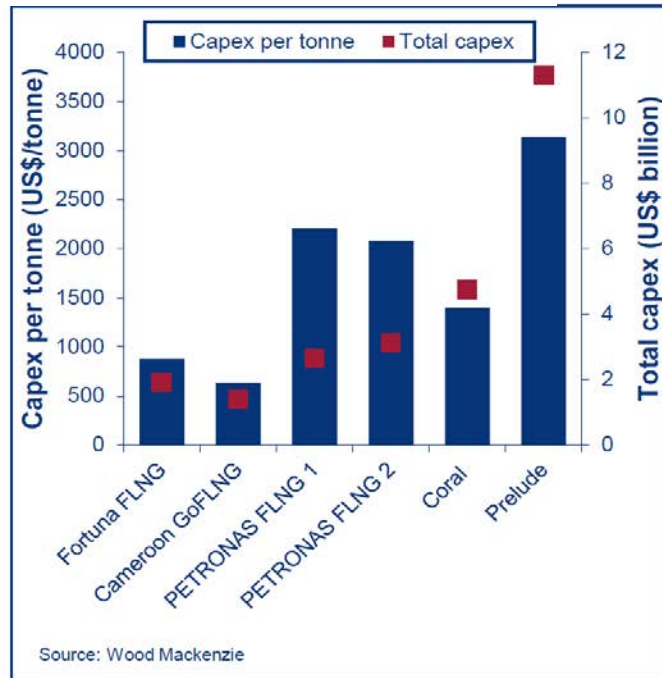


Liquefaction

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

FLNG Capital Costs



Gas to LNG

LNG to Users

LNG to Gas

Gas to Power

Gas as Fuel

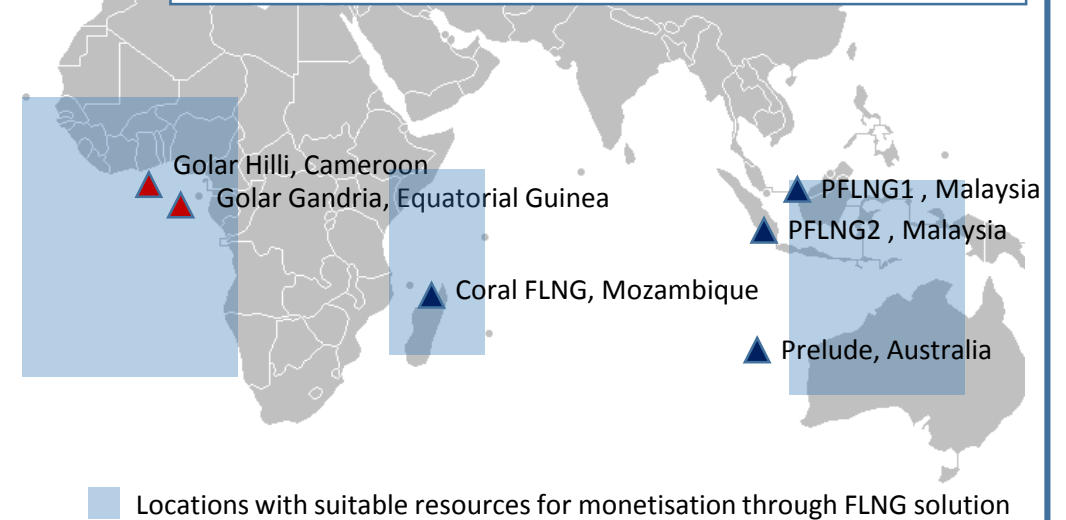
FLNG

Examples of Stranded Gas Fields across the world



FLNGs are the only viable solution for stranded gas:

- Stranded gas constitutes 40-60% of global gas resources
- Estimated 1,700 fields containing 3,500tcf of gas
- Fields considered too small and too remote, till now



Source: IHS, United States Geological Survey (USGS)

Conventional LNG to Power

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



Existing & Planned FSRU projects across the world



- FSRU capacity increased by over 30% in 2016.
- Emerging markets including India, Bangladesh and Ghana looking for fast-track FSRU solutions to meet growing power needs

LNG Shipping 2016: 30 existing and planned FSRU-based projects and nearly 40 subject to detailed discussion

6 NEW IMPORTERS in 2015 & 2016



Source: LNG Shipping May/June 2016

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

INDONESIA

- 85% electrified, 18,000 islands
- WoodMac forecasts power demand to grow by > 6%p.a., requiring US\$80bn investment through 2025.

MEDITERRANEAN

- Stranded power and industrial demand in Med islands to be fulfilled by small scale LNG.

CARIBBEAN

- 'hub and spoke' LNG distribution projects for diesel conversion projects.

Gas to LNG

LNG to Users

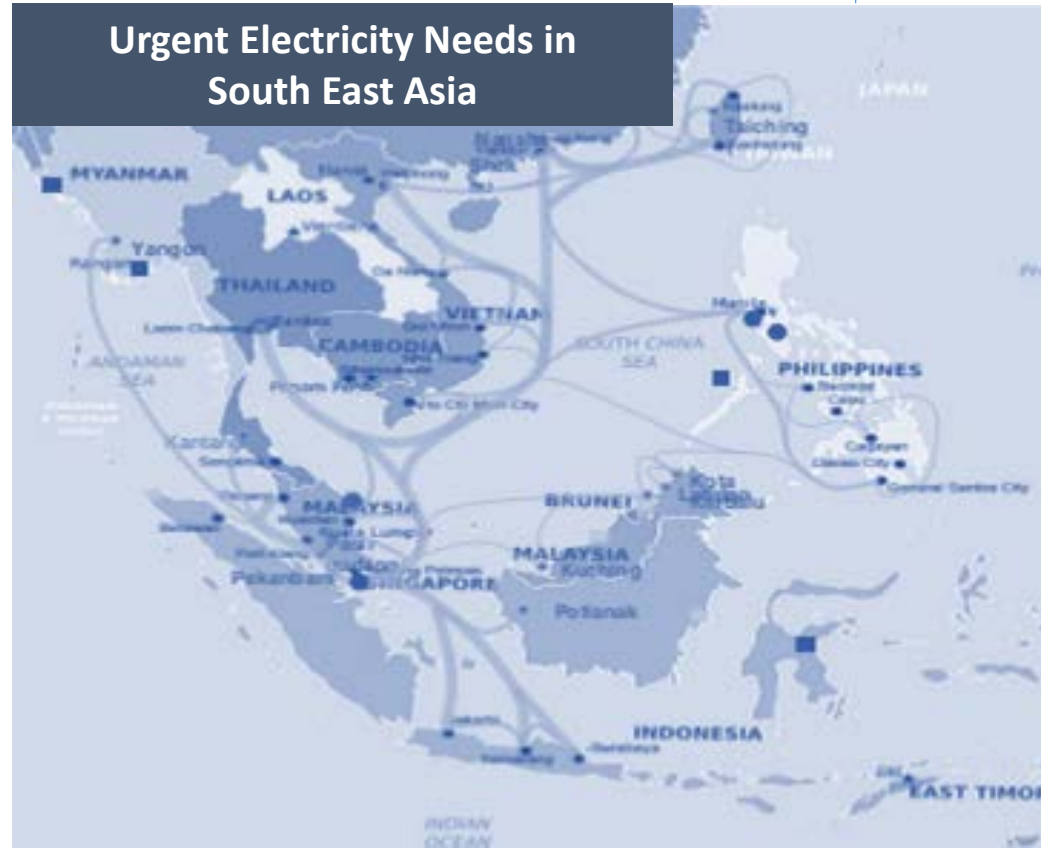
LNG to Gas

Gas to Power

Gas as Fuel

LNG Carriers, FSRUs, ORUs, Power Barges

Urgent Electricity Needs in South East Asia



- Archipelagic island power poised to grow on the back of urgent power needs
- Cheaper CAPEX & OPEX for Gas-fired plants

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

Gas to LNG

LNG to Users

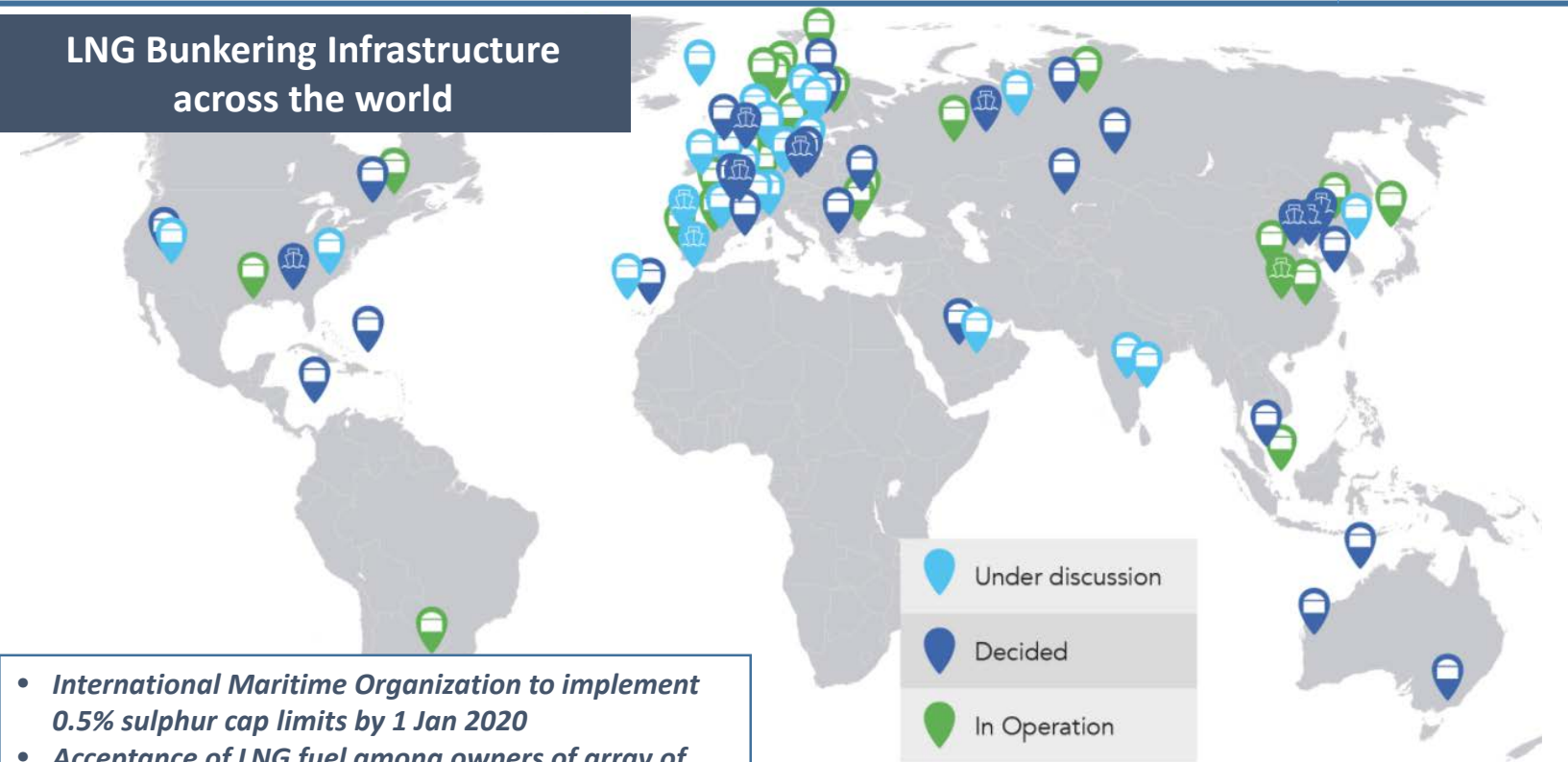
LNG to Gas

Gas to Power

Gas as Fuel

Gas-fueled vessels, LNG bunker vessels

LNG Bunkering Infrastructure across the world

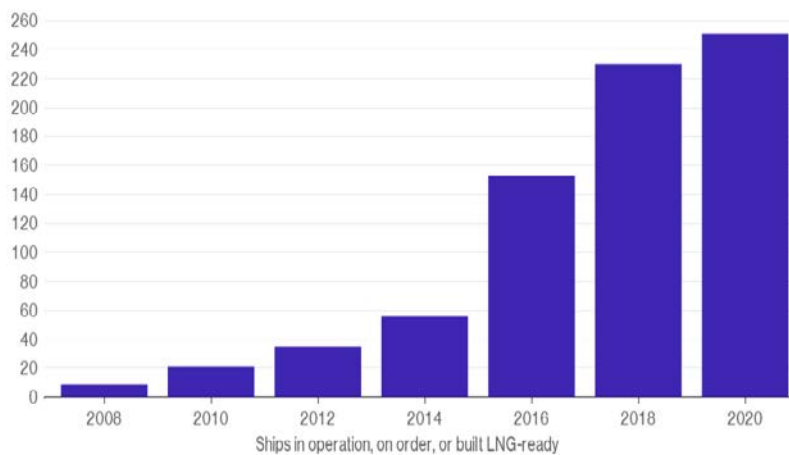


- International Maritime Organization to implement 0.5% sulphur cap limits by 1 Jan 2020
- Acceptance of LNG fuel among owners of array of ship types

Source: www.dnvgl.com/lngi

The Great Transition

Number of ships set to run on LNG is surging

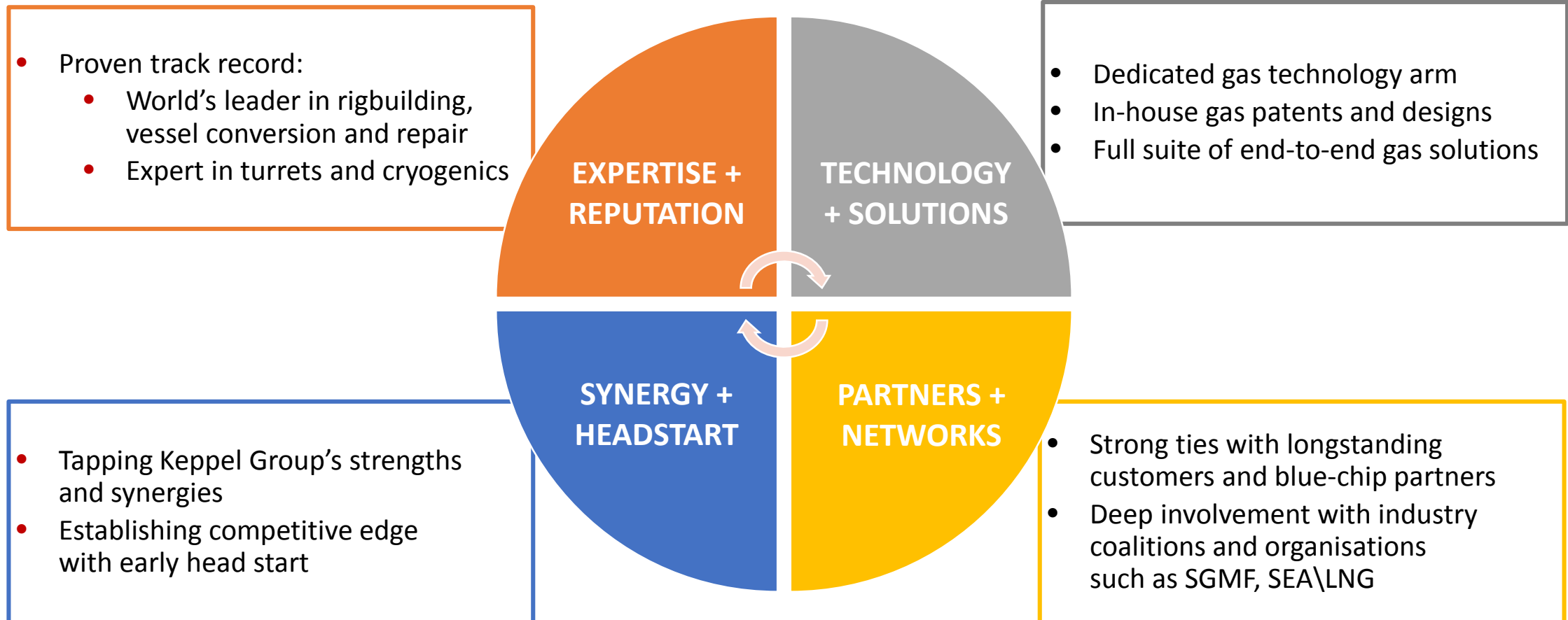


Source: DNV GL
*Excludes LNG carriers and inland waterway vessels

Bloomberg

Industry Partner & Enabler

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



An aerial photograph of the Golar Hilli FLNG Vessel under construction in a shipyard. The vessel is a large, complex structure with multiple decks and a complex network of pipes and machinery. The hull is painted in a bright orange color. The vessel is docked at a pier, and a large red crane is visible on the pier. The shipyard is filled with various pieces of equipment, including cranes, trucks, and other vessels. The water is a dark grey color.

GOLAR HILLI FLNG Vessel, July 2017



Turning Vision into Reality