



# Demanding customers: What LNG sellers need to know

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# Introduction

The LNG industry has evolved adjacent to the oil industry, but today it is in the throes of a transformation like that of oil in the early 1980s. Then, the oil market changed forever: from a business dominated by vertical integration, official prices and point-to-point flows, to one with a diverse mix of buyers, traders and sellers, and made newly transparent by the Brent benchmark.

Something similar is happening to LNG now. Prices are becoming more transparent, the universe of players has expanded dramatically and new suppliers and new markets appear on a regular basis. What was once a straightforward resource-led 'floating pipeline' from liquefaction plant to terminal has become a more flexible arrangement, where new business models and trade opportunities are essential to succeed. It is now less important where the molecules come from and more important where they go. Following demand is not enough: successful LNG suppliers and traders have to create it.

This report, following *Uncharted waters: LNG demand in a transforming industry* (KPMG, November 2015), marks the start of a new series exploring LNG markets — how they are changing, why, and how participants can change their business models to stay competitive.



**Mary Hemmingsen**

Global LNG Leader  
KPMG in Canada  
+1 403 691 8247  
[mhemmingsen@kpmg.ca](mailto:mhemmingsen@kpmg.ca)

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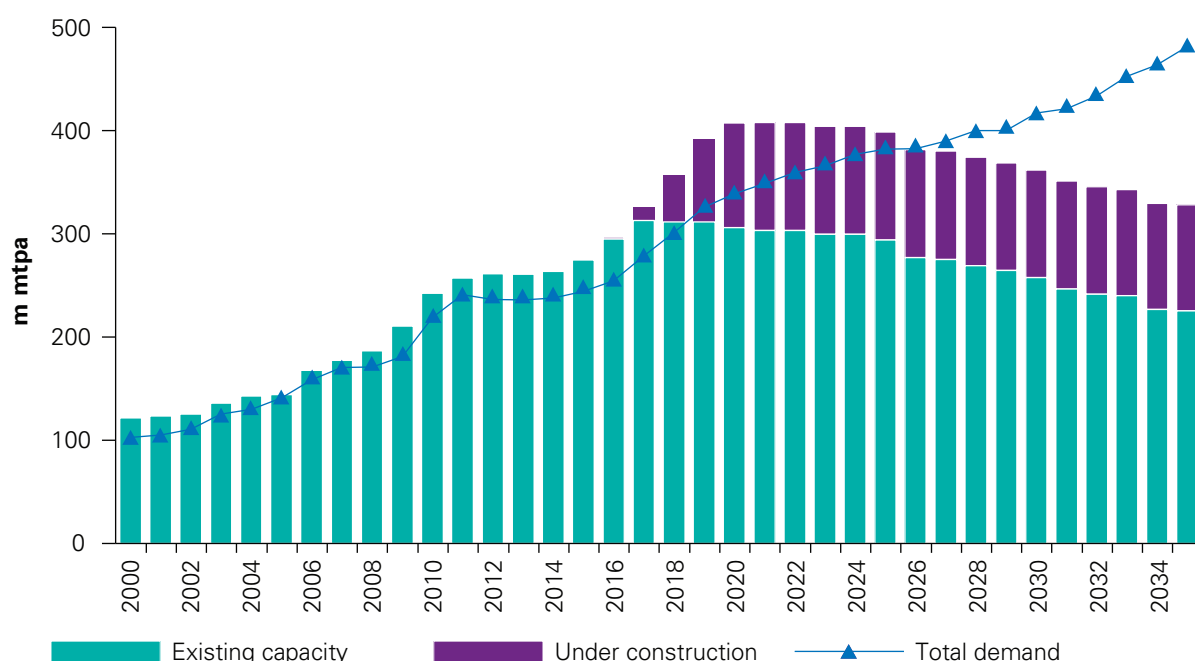
# Cycle and trends, together, drive this structural shift

The makings of the market and technological trends in LNG have been simmering for the last decade. But rapid transformation in LNG business models did not happen until cyclic conditions were supportive. On the supply side, a wave of new supply — and supply options — is combining with uncontracted volumes to drive down prices. On the demand side, buyer power has emerged. Quicker, cheaper and more flexible access is combining with cost and environmental drivers to create new markets.



## Overcapacity

LNG nominal production capacity and total trade (MMTPA), 2000–2035



### LNG markets could remain marginally oversupplied until 2022

Source: Wood Mackenzie; KPMG analysis. Production capacity includes capacity decommissioned, operational and under construction as of Q2 2016; total trade includes under development and existing demand

## Supply glut driver

The first change is the shift in the LNG market from a period of undersupply and high prices in 2011–2014, to a glut of new supply. The identity of the new suppliers is as important as the volumes. The previous supply surge, around 2008–2009, was led primarily by Qatar, which as a dominant player could manage the market to ease oversupply.

Now, Australia and the US, each with a variety of private-sector suppliers, are the main contributors. Post-2020, Canada, East Africa and others may join. From a time when liquefaction was essentially the preserve of the supermajor and large national oil companies, smaller companies and new entrants are able to participate, such as Cheniere in the US, Santos in Australia, Oil Search in Papua New Guinea and possibly Perenco in Cameroon. Oversupply has coincided with the fall in the price of oil from mid-2014, driving down both spot and oil-indexed prices.

Floating LNG plants in Australia, Malaysia and elsewhere offer potentially shorter-cycle production on a more modular scale (see the KPMG report *Floating LNG: Revolution and evolution for the global industry?*, November 2014). US exports, typically priced on the basis of feedstock cost (Henry Hub), plus the capital and variable costs of liquefaction, feature a completely different pricing scheme from traditional oil-linkage.

This period of oversupply may be extended as far as 2025 or, as Shell predicts,<sup>1</sup> it may clear by the early 2020s as low prices encourage demand growth. While weathering tough times now, LNG producers also need to look ahead to a future supply deficit given the usual long lead times of these projects.

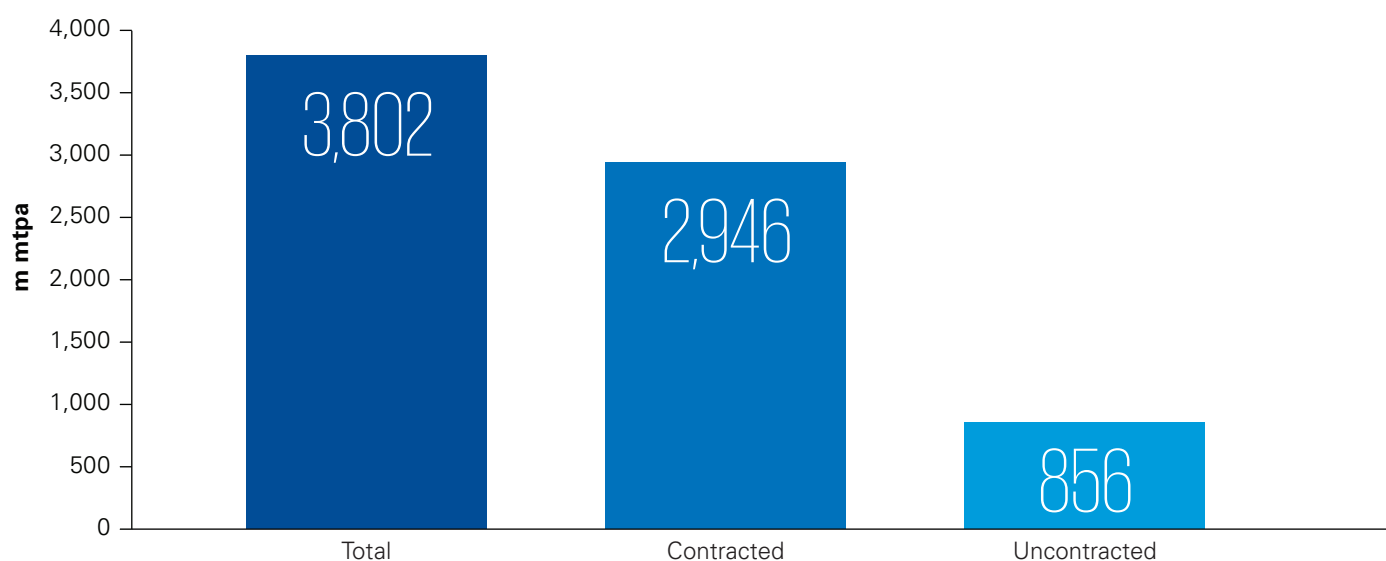
<sup>1</sup> Shell launches first LNG Outlook, <http://www.shell.com/energy-and-innovation/natural-gas/liquefied-natural-gas-lng/lng-outlook.html>

## Significant volumes uncontracted

And in weathering the times, the industry will have to accommodate significant uncontracted volumes that will push further downward on prices. Of about 3,800 million tons (Mt) of LNG expected to be sold in the 10 years (2016–2025),

856 Mt is currently uncontracted. 409 Mt comes from plants over 20 years in age, which could price close to marginal cash cost if required to capture customers.

### Expected production (MMT), 2016–2025



Source: Wood Mackenzie; KPMG analysis. Includes assets which are operational and under construction only

## Buyer consolidation

In response to recent high prices, buyers have sought to improve their competitive positions. Most notably, JERA (a joint venture of TEPCO and Chubu Electric), was formed in April 2015 as the world's largest LNG buyer, with 35 million tons per annum (Mtpa) of long-term LNG contracts. Other buyers have explored cooperation, for instance between Chubu Electric and India's GAIL, and between Tokyo Gas and Korea Gas.

After forming in 2015, a series of firsts was marked in 2016: In September, JERA resold its first cargo to South Korea. In December 2016, it made Japan's first purchase from the US mainland.<sup>2</sup> In November, the Japan Fair Trade Commission started an investigation into destination clauses that forbid the reselling of LNG to third parties. The removal of destination clauses would free up LNG to be resold to other markets when Japanese buyers are over-committed — or simply when a better trading opportunity presents itself.

The impact of this consolidation is greatly propelled by the shift to a buyer's market.

“

### Japan said to seek LNG contract details in resale-clause probe:

... removal of such clauses could trigger 'a flurry' of unrestricted outbound cargoes from Japan that may push down LNG prices for as long as 5 years. About 80 percent of long-term LNG supply contracts between major Japanese and South Korean buyers and suppliers are estimated to include destination restriction clauses... ”

—BMI research

<sup>2</sup> I.e. excluding previous purchases from the small Kenai plant in Alaska.

## Cheaper and more flexible regasification

On the buyers' side, one of the biggest changes is the emergence of Floating Storage Regasification Units (FSRUs). FSRUs are quick and relatively cheap to install and capable of serving smaller or seasonal markets or those uncertain about their longer-term demand outlook. First deployed in the US Gulf of Mexico in 2005, FSRUs have now become a standard

technology. New importers such as Kuwait, the United Arab Emirates (UAE), Egypt, Pakistan, Bangladesh, Jordan, Lithuania and Israel have opted for FSRUs. Established importers, including China and India, are also choosing FSRUs to add to their capacity.

### Floating storage regasification unit costs (\$m)



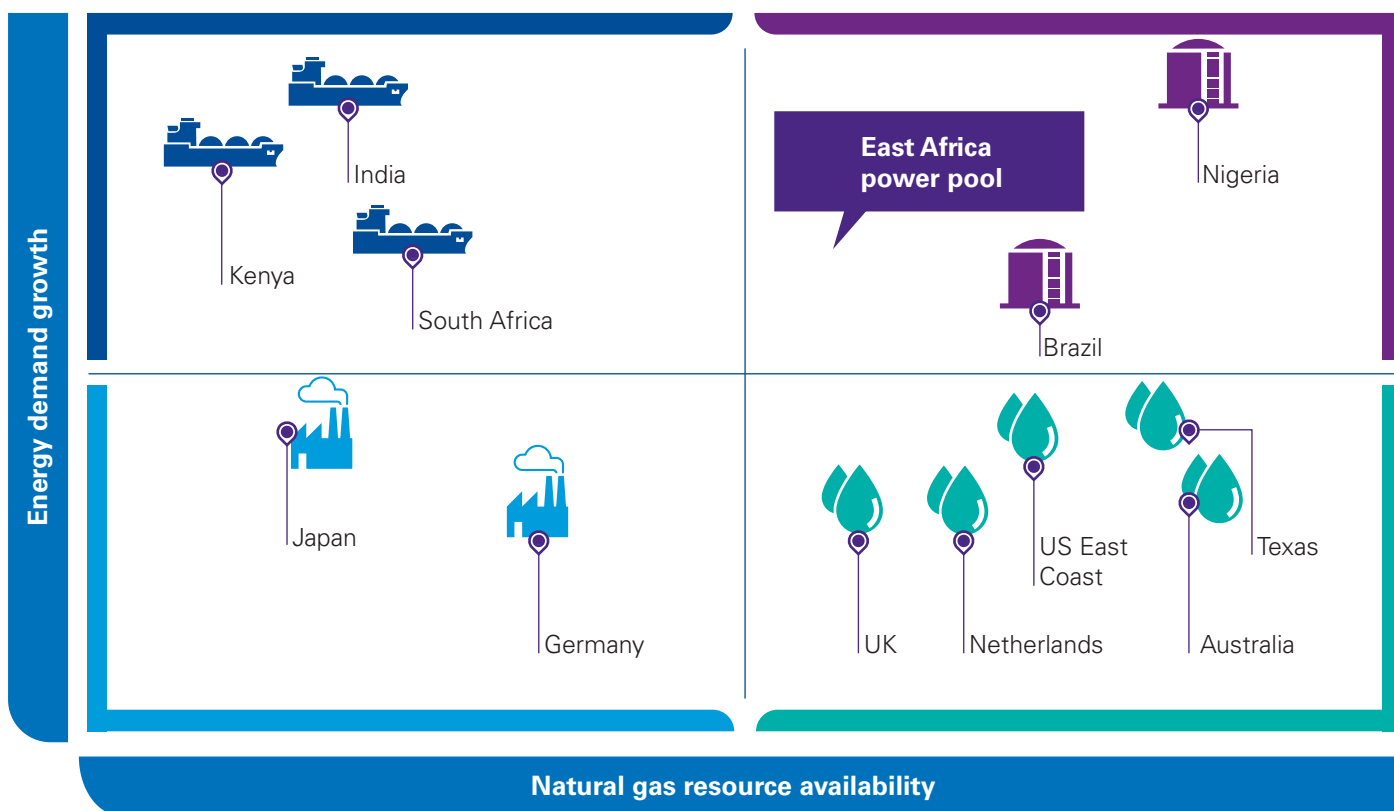
Source: Interest in Floating Regas Units Grows in Asia, June 2015. <http://www.poten.com/wp-content/uploads/2015/06/LNG-Opinion-Floating-Regas.pdf>



## New markets

The availability of competitively-priced LNG and the ease of market access via FSRUs are opening up new markets. The

drivers for LNG market penetration are different across each of the major new areas, as the following chart shows.



Archetype 1



Archetype 2



Archetype 3



Archetype 4

Please see page 9 for the definition of each archetype.

Source: KPMG analysis, 2016

Several new LNG consumers, such as the UAE, Kuwait, Egypt, Pakistan and parts of Indonesia, were formerly exporters or self-sufficient in gas but dwindling production and/or fast demand growth have moved them from Archetype 2 to Archetype 1. More countries will join this group in the years to come, and can be proactively targeted.

Some of these markets have relied on pipeline gas for a long period. Bringing in LNG is dependent on gaining access to (sometimes monopoly-owned) infrastructure. In other markets, particularly in Africa, developers need to create sufficient bulk demand, convert existing industries and power plants to gas, and overcome issues of inadequate infrastructure and less creditworthy customers.

Established buyers also offer a significant potential for growth. Though traditional Japanese demand is likely in long-term decline, two latent factors offer potential to drive further demand. These are transportation uses of gas for shipping and mass transit and broader urbanization of developing Asian countries. New middle classes will increasingly demand a cleaner environment, with both China and India having targets to reduce the share of coal and increase that of gas. India is seeking to grow the proportion of gas in its energy mix from 7 percent, currently, to 15 percent in the medium-term, which would still be below the world average of 24 percent.



## Archetype

## Description

1

### Developing economies with limited gas resource

- Rapid energy demand growth, usually as a result of rapid population growth and/or industrialization.
- Low natural gas resource availability (but may be high for alternatives such as coal and renewables).
- Affordable gas import supply and infrastructure required to increase role in energy mix.

2

### Developing economies with abundant gas resource

- Rapid energy demand growth, usually as a result of rapid population growth and/or industrialization.
- Resource availability for natural gas is already high.
- Natural gas and power midstream infrastructure required to increase gas role in energy mix.

3

### Advanced economies with limited gas resource

- Low/negative energy demand growth due to stagnating population, deindustrialization and more efficient energy technologies.
- Low natural gas resources but high availability of alternatives (coal, renewables, nuclear).
- Affordable LNG/pipeline imports and alternative policies required to grow use of gas.

4

### Advanced economies with abundant gas resource

- Low/negative energy demand growth due to stagnating population, deindustrialization and more efficient energy technologies.
- Material domestic natural gas resources (although dwindling in certain cases).
- Appropriate policies and market mechanisms required to increase role of gas.

## Competition from new — and old — energy sources

After a period in which LNG was simply too expensive to capture many new markets, falling prices have made it newly competitive. There is an important implication — to thrive, LNG suppliers need to keep their costs down.

But, though cheaper than oil, it faces competition. New renewable sources — notably wind and solar — are dramatically improving their costs, and becoming the lowest-cost source of power in suitable areas. But they still require complementary sources to match intermittency, with flexible gas usually the best option as an affordable resource to cleaner energy systems. And in this capacity, reasonably priced gas is likely to be the resource of choice for feedstock to chemicals and the fertilizer industry and for home heating.

Nuclear power is still struggling to maintain, let alone grow, its market share in most areas. Coal, to date, has remained highly price competitive and has limited the expansion of gas in China, India and parts of Europe. It offers diversity of supply, and often sustains local jobs. Even some Middle Eastern countries are showing interest in introducing coal power. Gas' environmental performance — on air quality and carbon dioxide — is, of course, far superior, making it attractive for governments seeking cleaner alternatives for Asian megacities. But even if gas gets a boost from policy, its premium to the coal price cannot be too wide.

To capture new markets from oil — notably in shipping and ground transport — LNG does not simply have to be cheaper. It needs to overcome the costs of conversion, the more complex logistics and the technical conservatism of users.





# Yet the supply- demand balance remains uncertain



The current unsettled global situation offers a number of uncertainties — economic, political and environmental — that could tighten the LNG market faster than anticipated (see chart below). This will not derail the reshaping of the LNG industry, but will affect the form and speed of the transition. Business models and the portfolios of buyers, traders and suppliers need to be robust to anticipate and respond to such eventualities.

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The current unsettled global situation offers a number of uncertainties — economic, political and environmental — that could tighten the LNG market faster than anticipated.”

 <b>Political</b>	 <b>Supplier</b>	 <b>Buyer</b>
 <b>Economical</b>	<ul style="list-style-type: none"> <li>— Middle East instability.</li> <li>— Russia cuts supply — again.</li> <li>— US caps further growth in US LNG exports.</li> <li>— Australia imposes a retroactive Domestic Market Obligation.</li> </ul> <p><b>Political instability in supplier countries reverses current sense of low supply risk.</b></p>	<ul style="list-style-type: none"> <li>— Air quality problems take hold in Southeast Asia, Korea, and China.</li> <li>— Global climate change framework strengthens.</li> <li>— Chinese stimulus.</li> <li>— Japan gives up on nuclear.</li> <li>— Beijing aggressively cuts citygate gas prices.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>— India goes green.</li> <li>— EU tightens up Emissions Trading System.</li> <li>— EU puts more firepower — and financing — behind interconnectors.</li> </ul> <p><b>Environmental awareness drives natural gas consumption.</b></p>
	<ul style="list-style-type: none"> <li>— Market elasticity arising from low prices (increase of demand).</li> <li>— New chemicals feedstock demand.</li> <li>— New industrial demand.</li> </ul> <p><b>Low natural gas prices drive demand for natural gas.</b></p>	<ul style="list-style-type: none"> <li>— Market elasticity arising from low prices (increase of demand).</li> <li>— Electrification pace accelerates and/or a greater role is realized for natural gas use in energy systems.</li> <li>— Japanese economic growth recovery.</li> </ul> <p><b>Global economic growth drives demand for natural gas.</b></p>

Source: KPMG analysis, 2016

# Trade patterns and prices are shifting — and the shifts feed off each other



## Changes in trade patterns

Greater buyer power, an excess of uncontracted LNG, a greater diversity of players and more flexible import infrastructure is driving a shift towards increased spot trade and shorter-term contracts, and a preference for Free On Board (FOD) rather than Delivered Ex Ship (DES). Spot and short-term trades reached almost 30 percent of overall trades in 2015. The expansion of the Panama Canal reduces journey times for US Gulf suppliers to Asia by 11 days.

As the glut of supply pushes prices down, buyers will seek to minimize their purchases of long term, oil-linked LNG in favor of spot supplies, and to renegotiate or exercise price redetermination clauses.

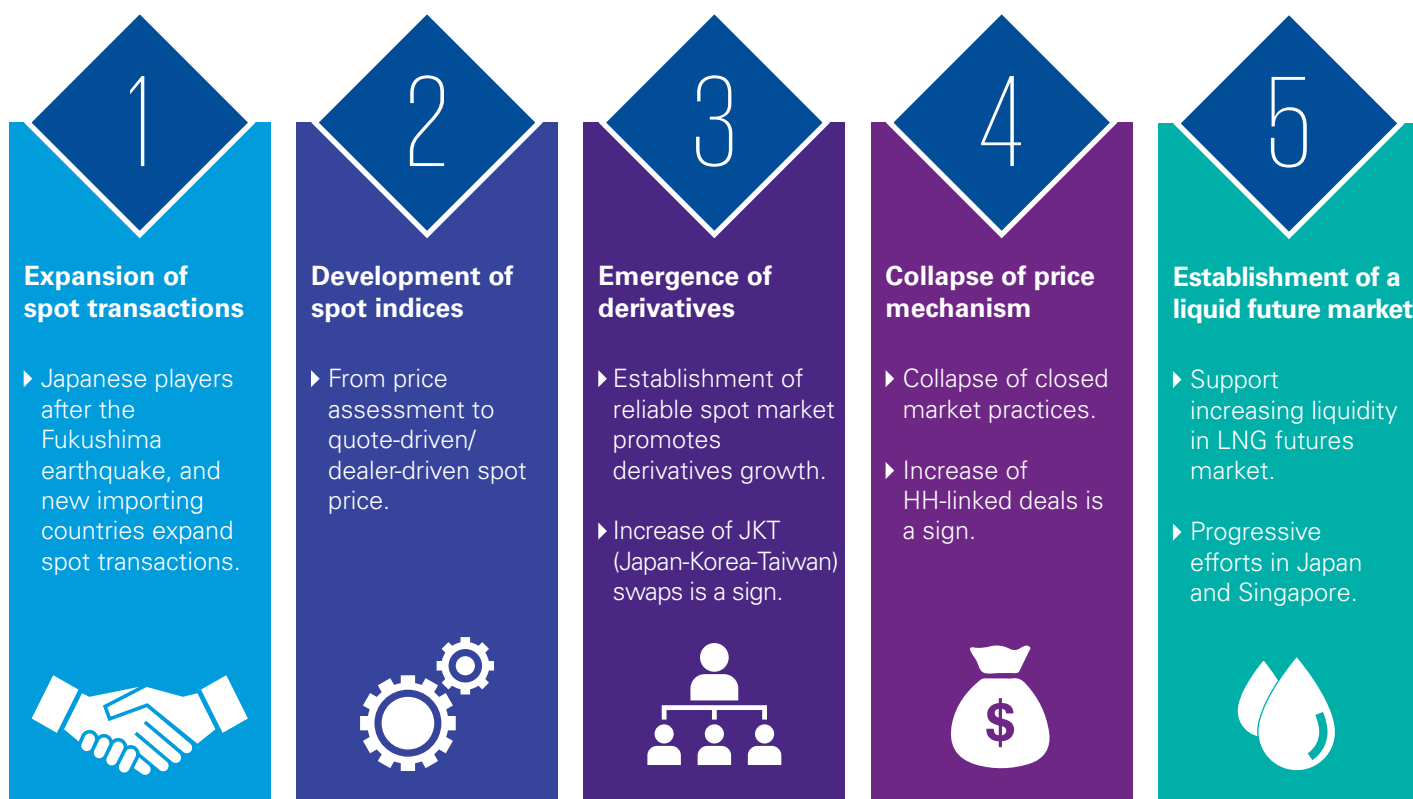
Although in the short term, suppliers may perceive this as negative, it makes LNG more attractive to buyers — so in the medium term, this expands the addressable market.

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In December 2015, Qatar’s RasGas reached agreement with India’s Petronet to reduce its contracted price by almost half and waive penalties for underlifting in return for Petronet’s increasing the long-term volumes it takes.<sup>3</sup>”

## New pricing formulae moving away from the oil link

### Five steps to the establishment of a liquid LNG market



## Establishment of a liquid LNG market

<sup>3</sup> RasGas, Petronet Revise LNG Contract to Lower Indian Prices, by Debjit Chakraborty and Rajesh Kumar Singh, December 31, 2015, <https://www.bloomberg.com/news/articles/2015-12-31/rasgas-petronet-revise-lng-contract-to-lower-indian-gas-prices>

A deeper, more liquid, more commoditized market, with new players along the chain, is spawning more variety on pricing — even as arbitrage between the major markets narrows. US suppliers are offering formulae based on Henry Hub, Singapore is promoting itself as a pricing hub, while price reporting agencies now quote Middle East assessments (based on delivery to Egypt) alongside the established JKT price. China, with access to domestic and imported pipeline gas as well as LNG, is another possible price hub.

New pricing bases create portfolio challenges for both suppliers and buyers. Even as global LNG prices converge,

differing only by the cost of transport, end-user pricing preferences may diverge to include oil-linked gas, hub gas, or coal. Buyers have to be confident their pricing basis aligns with that of their ultimate customers, who may be end-users of gas and/or electricity. New hubs create market tools for managing price risk, via hedging and options, but will take time to attract sufficient liquidity.

On the supply side, suppliers need to ensure sufficient revenues to underpin multi-decade investments in the tens of billions of dollars, and are doing so by looking for value within and along the supply chain in new business models and under new partnerships and adjacent activities.

## New players, new roles

With commoditization, new markets and new routes come new roles. New suppliers include operators of smaller, sometimes floating, liquefaction plants as well as tolling operators including several of the US projects. Big commodity traders, such as Vitol, Trafigura, Glencore, Mercuria and Gunvor, are entering the LNG business, as are oil companies that (so far) do not have LNG production of their own, such as Rosneft. Lower LNG prices and a more liquid market reduce the financial exposure on a single cargo.

Companies such as Shell and BP have long had strong LNG trading desks, but now traditional Asian buyers are becoming traders too — with JERA trading cargoes from Japan to Europe, and stating its intention to expand pan-Asia. Qatargas and ExxonMobil have formed a joint venture, Ocean LNG, to market their share of LNG from outside Qatar, particularly from their Golden Pass US venture.

The growing use of FSRUs creates a need for providers who often rent out the vessels for relatively short periods, such as Excelerate and Golar. Small-scale LNG for shipping, ground transport and isolated users will create further business in LNG storage, breaking bulk and redistribution.

Commoditization will bring the expansion of market mechanisms. As Vitol's head of LNG, Pablo Galante Escobar, told the Financial Times, a larger LNG derivatives market will develop similar to oil.<sup>4</sup> Traders are investing in physical LNG infrastructure, with Vitol restarting an import facility at Teesside in North East England to give them advantages in market intelligence and access — similar to those they have in oil and metals markets.



<sup>4</sup> 'Vitol LNG chief says 'price war' could drive UK gas prices below US' Financial Times, 23rd February 2017, <https://www.ft.com/content/3a32d096-51aa-3b8b-8792-6e4f52a41787>

# Conclusion

The combination of new technologies, new markets and oversupply is overturning old uncertainties in the LNG business. Incumbent suppliers and buyers need to develop very different business models from their traditional approaches. The current glut in supply puts a premium on creating and accessing markets. This period will be very challenging for high-cost suppliers, with pressure on margins and/or utilization rates. But the supply-demand balance could tighten faster than some expect with uncertain political, economic or environmental developments — demanding robust, flexible portfolios.

Conversely, buyers are in a good position to bring down their costs and restructure their portfolios, but overcommitted purchasers will have to find outlets for surplus cargoes. Equally, buyers will need to avoid being complacent in the event the market turns more quickly. And a more flexible and liquid value chain offers new niches for traders and other specialists. Smaller, energy-short markets can now seriously consider LNG as a viable solution.

Gas, through LNG, is ideally placed to expand its role as one of the world's key energy sources in a cleaner future. But the business still needs to be reoriented around customer value in an affordable, accessible and acceptable low-carbon system.

# Contact



**Mary Hemmingsen**

**Global LNG Leader**

**KPMG in Canada**

+1 403 691 8247

mhemmingsen@kpmg.ca

Mary Hemmingsen is a regular author on the LNG industry and speaker, moderator and chair at LNG conferences around the world. She brings over 25 years of experience as an energy business leader in asset management and related business development. This includes leadership in the development and delivery of policy, strategy, initiatives and projects for energy, power, utilities and related infrastructure businesses in a range of capacities in both the public and private sector and for major utilities and global energy and asset managers. She advises a number of the largest LNG global players on their interests in development, contracting and portfolio management.

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