



# Uncharted waters: LNG supply in a transforming industry

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# Introduction

The global liquefied natural gas (LNG) market is transforming. In early 2016, the US is expected to start LNG exports from the Gulf coast, a plot twist that was unthinkable even 10 years ago. Australia will soon be an exporter on a scale to rival Qatar. LNG importers are becoming exporters and vice versa, but low prices threaten new projects and the profitability of existing ones. This transformation combines three key trends:

- **The LNG market is globalizing** as the numbers and types of buyers and sellers expand.
- **Pricing models are changing** under the stress of increased supply and lower energy prices. Low prices destroy supply, but price has to be competitive to create demand. Prices are set to converge between the major markets, while new pricing nodes may emerge.
- **There are major uncertainties over supply.** There are many possible new projects, but their progress depends on anticipated demand and price levels, and on the capability of sponsors to see them through to completion.

## LNG supply uncertainties

**Short-term:** Project completion and startup; cash costs versus coal

**Medium-term:** Absorption of current oversupply; capital cost cuts; price outlook; new investment decisions; unconventional gas supply costs; floating liquefied natural gas (FLNG) success

**Long-term:** Demand outlook; new pricing models; Iran and Russia strategies; new resource opportunities

This report, following *Uncharted waters: LNG demand in a transforming industry* (KPMG, November 2015), is the second in a series exploring LNG markets — how they are changing, why, and how participants should react. Key strategic considerations for each part of the market are:

**LNG producers:** Project developers need to decide when the window for new investment decisions will open. Meanwhile, they need to focus on reducing capital costs, sharpening project delivery capability and seeking out synergies, to give their LNG plans the best chance of success. They may trim their portfolio of undeveloped resources, but need to hold on to their best growth prospects.

**LNG traders:** New supply offers new trade routes, as well as different pricing bases. If they decide to own a stake in physical assets, they need to ensure it adds real value, including information, and does not result in overexposure to commodity price risk.

**Governments:** Lower prices and intensifying competition between jurisdictions put more stress on resource-holding governments to facilitate LNG projects' progress, while still achieving community, fiscal and environmental benefits. Regulatory and taxation frameworks designed for a high-price environment may need to be rethought.

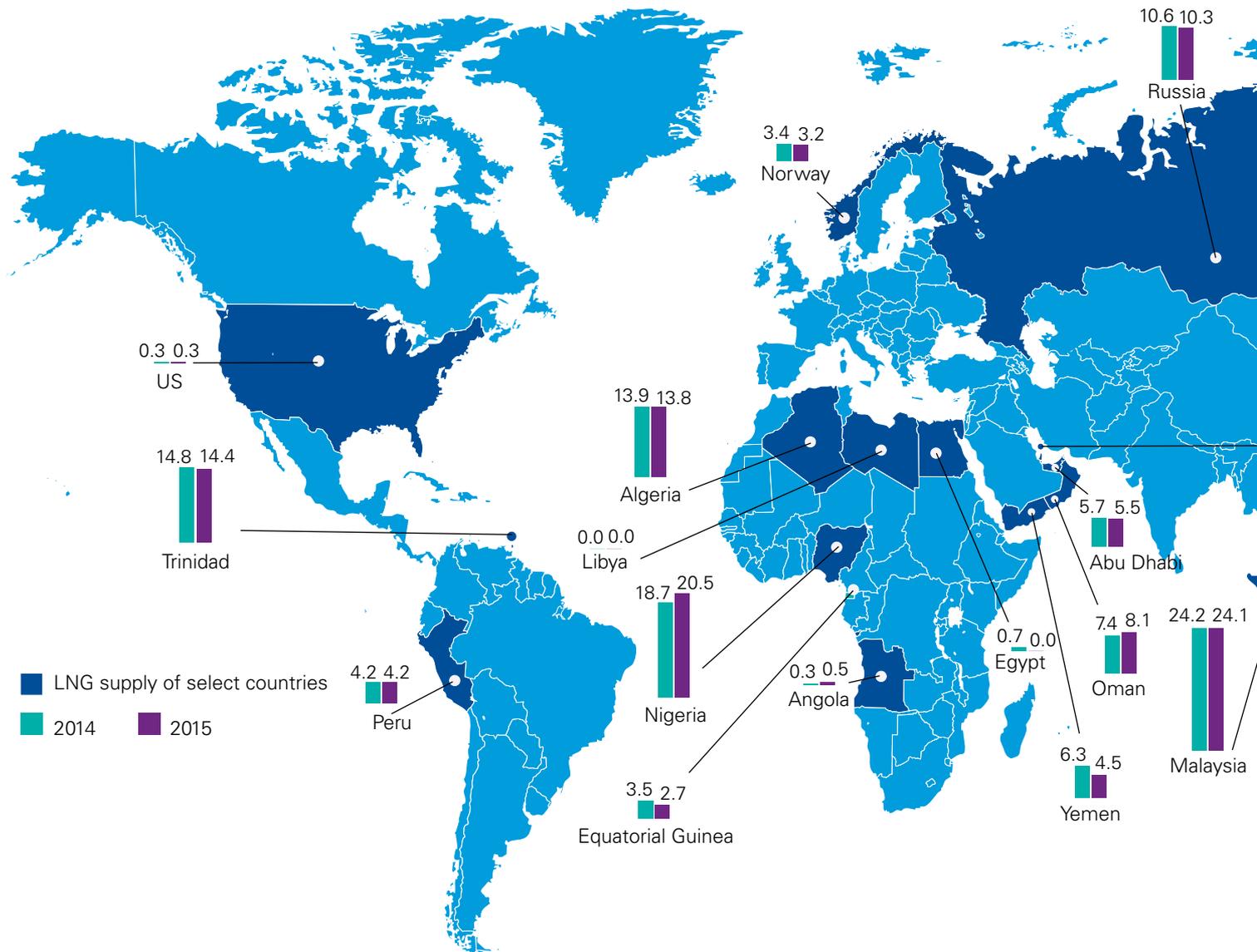
**LNG buyers:** The lower price gives LNG buyers the chance to rebuild their end-user markets. They need to be competitive against coal, in both Europe and Asia, as well as competing pipeline gas. Asian and some African countries have the opportunity to complete the displacement of oil in industry and power generation, build out gas-using infrastructure and create new demand. They also have the chance, at reasonable prices, to take minority stakes in existing and future projects, building vertical integration and a portfolio hedge. But LNG buyers need to choose carefully for future supply, from robust projects with the best chance to reach Final Investment Decision (FID) and be delivered on time.

# LNG supply outlook

There are major uncertainties over future supply: in the short term, the number of projects proposed far exceeds the number needed to meet demand. Of course, this depends on the view of demand (as discussed in the first paper of this series). But many of these projects will not come to market: some because of political reasons, many because they are not economically competitive in a crowded field.

Globalization is also introducing some new suppliers with very different business models: US shale-to-LNG; floating LNG; and trading aggregators. The use of unconventional resources and floating LNG has been opened up by technological innovation. The rise of more flexible trading shows a combination of commercial innovation, a more diverse and liquid market, and new technology in the form of floating storage and regasification.

**LNG supply of select countries, 2014–15 (million tonnes per year)<sup>5</sup>**



### Short- and medium-term

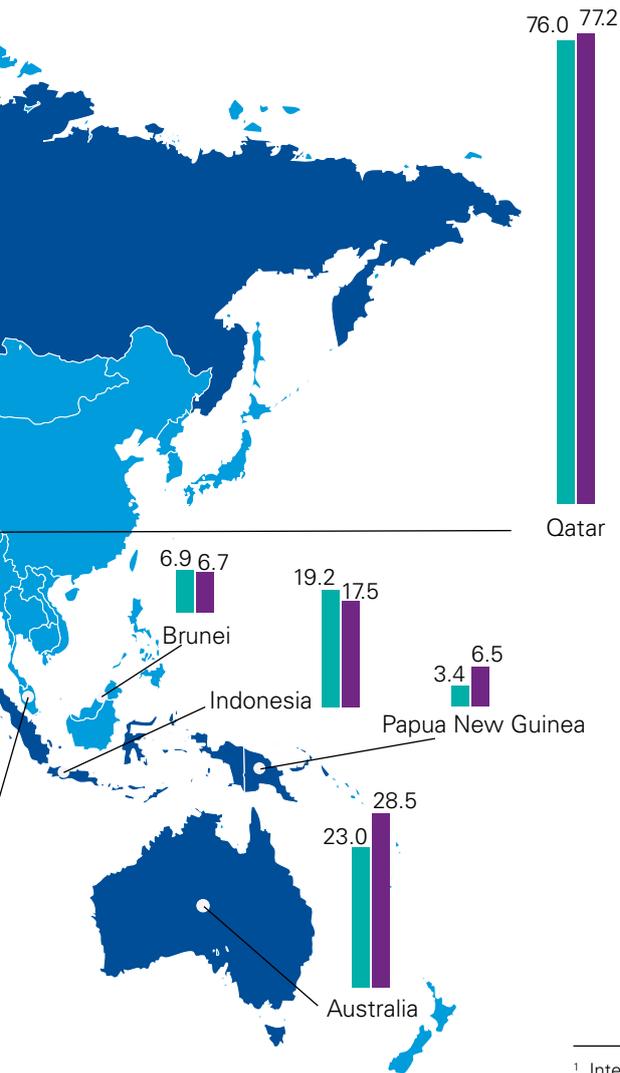
The near-term outlook for LNG output is very strong due to completion of the wave of projects launched in recent years in the expectation of strong Asian demand and high prices. LNG supply has grown at an average of 7 percent per year since 2000, faster than any other source of gas.<sup>1</sup> With current capacity around 250 million tonnes per year (Mtpa), a further 140 Mtpa is under construction. Global LNG production grew 2.7 percent (6.8 Mtpa) in 2015, mainly led by Australasia. Continuing supply additions will come also from the US as it becomes an LNG

exporter for the first time,<sup>2</sup> based on its large and low-cost shale gas supply, an addition to the market unforeseen less than a decade ago.

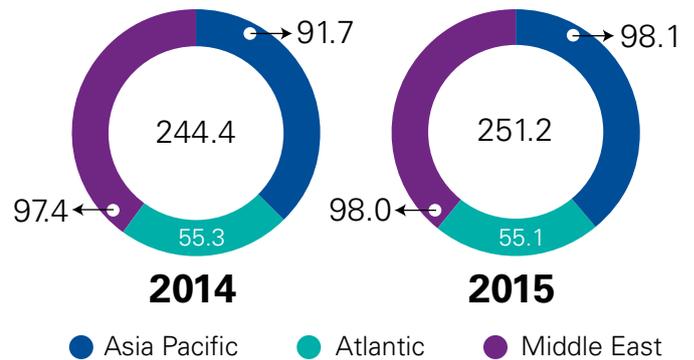
This wave of supply is coinciding with relatively weak near-term demand, as Japan restarts its nuclear reactors and the Chinese economy slows. Sellers are turning to offer more flexible contracts, removing destination restrictions and allowing spot resales.

The number of LNG projects nearing a FID in 2016 has not yet reduced significantly, in contrast to the postponement of 45 upstream oil and

gas projects.<sup>3</sup> Seven projects could take FID in 2016: two in Mozambique, one in Canada and four in the US. Despite the weak commodity price environment and concerns over Chinese demand, completed projects with low variable operating costs are likely to run close to maximum capacity. However, low coal prices may lead to some US supply into Europe and Asia failing to cover cash costs (Henry Hub plus shipping),<sup>4</sup> at gas prices around US\$4 per MMBtu. Climate and environmental policy post the COP21 climate talks in Paris last year, may be important in curbing coal use in favor of gas, particularly in Europe.



### Global LNG supply (million tonnes per year)



<sup>1</sup> International Gas Union  
<sup>2</sup> Other than the small Kenai plant in Alaska  
<sup>3</sup> Wood Mackenzie, 'Global gas prices — what will set the floor?'  
<sup>4</sup> Wood Mackenzie, 'Global gas prices — what will set the floor?'  
<sup>5</sup> Poten & Partners (2015)

The LNG shipping market is also currently oversupplied: charter rates in 2015 fell to a quarter of 2012 levels,<sup>6</sup> and 45 ships were idle. As of the start of 2015, there were 152 LNG vessels in the order-book, compared to a global fleet of 247.

**Table 1. Supply headlines by major LNG producers**

<b>Australia</b>	<ul style="list-style-type: none"> <li>— Australia will grow from just under 30 Mtpa to 75 Mtpa in 2020.<sup>7</sup></li> <li>— 2016 will be a big year for Australian LNG. The successful startup of BG's Queensland Curtis LNG and the introduction of feed-gas to Australia-Pacific LNG and Gladstone LNG has speeded up online-supply expectations.</li> </ul>
<b>US</b>	<ul style="list-style-type: none"> <li>— 65 Mtpa of LNG export capacity under construction.</li> <li>— Cheniere Energy expects to start shipments in February or March 2016.</li> <li>— As of July 2014, the Department of Energy received 43 applications for permission to export LNG, from 34 proposed terminal projects.</li> <li>— All of these applications have been approved for 18 Free Trade Agreement (FTA) countries, of which six currently import LNG (South Korea, Singapore, Mexico, Canada, Chile and Dominican Republic).</li> <li>— Seven projects have received Federal Energy Regulatory Commission (FERC) permission to export to non-FTA countries.</li> <li>— Free-trade negotiations with the EU (Transatlantic Trade and Investment Partnership) and with a group of Asian countries (Trans-Pacific Partnership) may widen the circle of FTA buyers.</li> </ul>
<b>Qatar</b>	<ul style="list-style-type: none"> <li>— The world's largest LNG supplier (77 Mtpa capacity).</li> <li>— Qatar's output could rise modestly by debottlenecking, to 80 Mtpa by 2018.</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>— <b>Algeria</b> has been hit by a shortfall in domestic production, in part due to internal instability and rising internal gas demand.<sup>8</sup> Outlook for total supply in Algeria has dipped by more than 3.5 Mtpa. Estimated for production of 19.0 Mtpa in 2017.</li> <li>— <b>Indonesian</b> upstream developments have waned and a lack of investment into Bontang LNG has prompted Indonesia's LNG supply to drop in 2015 to 17.5 Mtpa.</li> <li>— <b>Nigeria, Trinidad and Malaysia</b> will produce a steady output of LNG.</li> <li>— <b>Angola</b> (5.2 Mtpa) is offline for repairs.</li> </ul>

## Long-term: 2025 and beyond

In the longer term, the LNG industry will need to launch new projects to meet growing demand.

**Australasia:** There are several options for further LNG exports after completion of the current wave of growth, both greenfield projects, including in Papua New Guinea, and debottlenecking or brownfield expansions. These are a core part of future portfolios for most global LNG players, given Australia's skill set, political stability and business-friendly climate. But new investment decisions depend on improving cost-competitiveness, meeting environmental and community requirements, and finding new solutions to the problems encountered with the current wave of megaprojects.

**Southeast Asia:** As the historic heart of the LNG export industry, declining reserves and dwindling production

present challenges to sustain output from existing plants. Some new, mostly smaller, projects are being launched, such as Petronas's two floating LNG plants in Malaysia and Donggi-Senoro in Sulawesi, Indonesia. Unconventional resources (shale and coal-bed methane) are attracting interest. Increasingly, intra-regional and even domestic LNG trade will grow in importance to satisfy demand across the archipelago and peninsular Malaysia.

**US:** A long list of projects exporting shale gas is at various stages of approval, including some conversions of existing import facilities. Given the current price environment, not all will go ahead in the near term. However, they could be relaunched later when market conditions permit. As Brian O'Neal, Managing Director, Oil & Gas, KPMG in the US, notes, "There is a similar issue for both new gas production and LNG export capacity in this market: available capital. Tens of billions of dollars from private equity and commercial banking have been

raised to buy distressed E&P assets, but buying in size hasn't happened just yet. Similarly, tens of billions of dollars are required to develop LNG exporting facilities, but investors are still picking their places rather than rushing headlong into the market." One attractive feature for ongoing investment or potential relaunch is a quick-start capability: the ready availability of feedstock and construction skills gives many of these projects a unique advantage, making them a key part of a balanced portfolio.

The US business model is heavily influenced by commercial capabilities: tolling facilities, Henry Hub pricing and a possible relaxation of destination restrictions to permit flexibility in marketing and delivery. O'Neal points to the way that US LNG developers are "looking at other revenue streams, such as gathering and marketing. Mergers and acquisitions, and raising additional capital, should also be important. In many ways, LNG looks like the early stages of oil trading's development: what started

<sup>6</sup> RS Platou monthly, April 2015

<sup>7</sup> Poten & Partners, 'Global LNG Outlook, Key Insights on Current & Future Trends', June 2015

<sup>8</sup> Lidia Puka, 'Pushing the Limits of Algeria's Gas Exports to the European Union', The Polish Institute of International Affairs, No.72 (804), 13 July 2015

as a peer-to-peer market is starting to look towards index-pricing, destination flexibility and route optionality. If the market continues to develop, it should help traders make money from asset optimization and the ability to direct cargoes for intermediaries and smaller LNG players.”

**Canada and Alaska:** Greenfield projects in British Columbia and Alaska also enjoy an abundant gas resource base, political stability and proximity to Asian markets, but need to overcome cost, environmental issues, relations with indigenous groups (First Nations) and policy hurdles. LNG exports from Canada are estimated to start in 2023 and reach 12 Mtpa by 2025.<sup>9</sup>

**East Africa:** Giant deep-water finds in Mozambique and Tanzania are slated for LNG development. They appear highly cost-competitive, and well placed to supply Asia. ENI has partnered with the Mozambique national oil company ENH, PetroChina, Korea Gas and Galp Energia in Coral LNG, while Mozambique LNG, with a reported 75 trillion cubic feet of gas, groups Anadarko, ENH, Mitsui, PTT and three Indian companies — ONGC Videsh, Bharat PetroResources and Oil India. As such, both these consortia have the classic blend of an international oil company (IOC), a national oil company (NOC) and several companies from major LNG-importing nations.

However, they face challenges of developing suitable local infrastructure and workforce skill sets, meeting domestic and new industrial gas requirements, and improving government and institutional capacity.

Other African countries may become LNG exporters too, depending on exploration success, while others move to import modest quantities of LNG to replace oil for power generation.

Low oil and LNG prices challenge the economics of greenfield LNG projects. Mark Essex, Associate Director, KPMG Africa International Development Advisory Services, notes some of the issues: “There is a lack of infrastructure, and vast amounts of equipment needed in remote areas in northern Mozambique. It may be possible to get private-sector interest, as well as that of the donor community, in assisting for instance in constructing roads. The governments are not in denial about the hurdles — they appreciate where these projects sit in a global supply perspective.” Political issues may also delay projects, with Jean Githinji, Senior Manager, Energy and Natural Resources, saying that, “Now, Mozambique is really starting to pull away — legislation has come through. Tanzania is going at a slower pace due to elections. It is election season in East Africa now, and priorities to oil and gas projects are changing, but government flexibility can keep projects going.”

**Middle East:** This region has large, low-cost resources, as well as the world’s current largest LNG supplier, Qatar. Further expansion of Qatari LNG looks unlikely at the moment, as the moratorium on further development of the North Field continues. Iran, which shares the North Field (South Pars) with Qatar, has ambitious LNG plans after the lifting of wide-ranging sanctions, but these have to attract foreign investment and compete

with domestic demand and pipeline export projects. Geopolitical concerns continue in the region, highlighted by the cessation of LNG exports from Yemen during the war there. Meanwhile, in the Eastern Mediterranean, LNG remains an option for fields discovered off Israel, but these still face cost and political hurdles.

**Russia:** Though primarily a pipeline exporter, Russia’s giant, low-cost resources and desire to expand customers beyond its European base make LNG a viable option. LNG appears to be a core component of Gazprom’s East Asia strategy, but has yet to be balanced against plans for pipelines to China. Further progress depends on political relations with neighbors, and availability of finance and technology, currently constrained by sanctions.

**Wild cards:** A decade ago, few would have foreseen the emergence of giant gas fields ready for LNG in East Africa or the Eastern Mediterranean, let alone unconventional resources. New finds may contribute to LNG from 2025 onwards, such as recent discoveries off northwest Africa or emerging unconventional plays. Depending on the success of the early Petronas and Shell projects, floating LNG may become a viable option for smaller fields in Australasia, Africa and Latin America (see the KPMG report *Floating LNG: Revolution and evolution for the global industry* (November 2014)).

The chart below<sup>10</sup> assesses in outline where the main challenges lie in each of the leading areas for future supply, ranking issues from red (most serious), through orange, to green (least serious).

**Table 2. Challenges of leading countries for future LNG supply**

	Proven resource base	Upstream gas cost	Capital cost	Political/regulatory support	Location maturity	Environmental sensitivity
Australasia	●	●	●	●	●	●
Southeast Asia	●	●	●	●	●	●
US	●	●	●	●	●	●
Canada/Alaska	●	●	●	●	●	●
East Africa	●	●	●	●	●	●
Middle East	●	●	●	●	●	●
Russia	●	●	●	●	●	●
Wild cards	●	●	●	●	●	●

● Most serious      ● Normal      ● Less serious      ● Unknown

<sup>9</sup> Poten & Partners

<sup>10</sup> Not intended to refer to any specific project or company

“We don’t have a history of cost reduction. But if we don’t, we are going to have a less bright future than we ought to.”

**Andrew Walker,**  
Vice-President of Marketing at  
Cheniere Marketing, European  
Gas Conference

## Winning LNG business strategies

### For LNG sellers

Any project today faces the challenge of costs: whether maximizing returns from existing projects (even if operating expenditures are a relatively small part of the total) or, even more importantly, reducing capital expenditures to keep new projects viable. Jonathan Smith, Partner, Energy & Natural Resources, Oil & Gas Sector Leader, comments, “Operating models were built for a higher oil price, and need to be rethought, with companies going back to core competencies. Australian projects are focusing on managing cash flow and working capital, and on integrated planning from the wellhead.”

Starting major new projects in remote areas poses its own challenges. Mark Essex suggests that, “To get these projects to FID in the current situation requires improving the economics: shared infrastructure, better fiscal terms, economies of scale and possibly floating LNG. It will take more time for financing. Greenfield projects are expensive, so it is key to get one project off the ground and take it from there.”

- **Major IOCs** have a presence in most of the leading LNG supply areas, or could enter them if they wish. Optionality is key. LNG project timelines are long but there is an advantage to being first-mover when market conditions permit — reducing construction cost inflation and competition for offtakers. Companies, though, have to avoid significant ongoing spending on resources with no immediate prospect of coming to market, while managing the expectations of governments who want to see projects moving ahead. Companies can be alert for a change — for instance in market, government policy or new infrastructure — that brings a mothballed project into viability. They may be able to create these conditions by exploring for new nearby gas fields or partnering with other resource-holders in the vicinity to build critical mass. Or, new technology such as floating

LNG may unlock a previously stranded resource.

“Companies are looking at the portfolio,” as Jonathan Smith notes. “Do they divest, hang on, or try to bring in new partners, who may offer synergies?” Asset swaps may be another option to move resources to the hands of their natural owners.

As Brian O’Neal notes, large IOCs may have the luxury of a long time horizon, enabling them to ride out industry cyclicality. “Shell, with its move to acquire BG, is a good example of a company that decided to get very long on gas in a historically low-priced market. Other large LNG developers are looking at the viability of facilities on a 20- to 30-year horizon.” Smith points out that “Just as none of the early-2000s evaluations looked at the possibility of US\$100 per barrel oil prices, so current LNG scenarios did not look at US\$35 per barrel. LNG is a long-term, cyclical business — projects take a long time to FID.”

- **Smaller companies** may focus on a specific geographic or technological niche, such as Australasia or US shale-to-LNG. They need to develop expertise in their home market, and rely on local knowledge and relationships to beat the geographic generalists. Some may have entered the LNG business through necessity, as the only viable route to market for gas they have acquired or discovered in a remote region (as in parts of Africa). They need to build the skills, financing and marketing relationships to carry a large project through to completion. This will often involve partnerships, such as:
  - A large LNG developer — though a smaller company needs to ensure its project retains priority in a major’s portfolio
  - An engineering or services company. For instance, in January 2016, Schlumberger signed a preliminary agreement to take a 40 percent stake in Ophir’s Fortuna floating LNG project in Equatorial Guinea

— An LNG buyer (probably a portfolio trader, and/or an Asian importer), who may take equity in the project

Given the squeeze on financing, O’Neal notes that smaller companies “have to make capital markets understand the long-term pricing and nature of the asset.”

- **NOCs** may have the scale and financial resources of a super-major, but be largely confined to their home base. Some, such as Petronas, are acknowledged LNG experts; others have to build the required skills or gain them via partnerships. Some NOCs, such as Qatar Petroleum, have entered international projects to build a more diversified marketing portfolio. Further development of some national LNG industries may depend on balancing local gas demand against the prospect of export revenues. For international projects, they will need to advance their capabilities in the same way as an IOC, while minimizing overlap with their domestic LNG output.

#### For governments

Governments with promising resources for LNG should consider how they can support companies’ efforts to move them to development. A wide range of governments, from state-level (such as British Columbia, Western Australia and Queensland) up to national level, are now dealing with LNG developments. This includes some that are very familiar with the LNG business, as well as others, such as Mozambique and Tanzania, that are now tackling it for the first time. Low- and middle-income countries may face challenges in developing institutional capacity to regulate and support their emerging LNG industry, but even some high-income countries are discovering the complex issues these megaprojects raise.

Governments have to balance the demands of environmental and community stakeholders with those of project proponents and local businesses. LNG development may impose social and infrastructure costs, but it also creates direct and

indirect jobs, new skill sets, gas supply for local industry and tax revenues. Governments need fiscal regimes that keep projects profitable, especially during periods of low commodity prices, while ensuring citizens see fair compensation for their country’s natural resources. Regulations have to be robust but not excessively onerous. Governments may also have a role in coordinating multiple developments to avoid wasteful duplication and provide common infrastructure.

To maximize in-country value from new LNG projects, governments in Tanzania and Mozambique are working with gas companies and international institutions. Jean Githinji notes that “Mozambique received World Bank support to revise its gas terms to best-practice, while Anadarko committed large resources to help with capability development. Skills for Oil & Gas in Africa has partnered with development agencies from the UK (DFID) and Germany (GIZ), and BG supported the initiative, to develop the local workforce in Tanzania.”

#### For LNG shippers

Jonathan Smith observes that LNG producers are looking at the shipping part of their operations. “Companies are asking: Is there another way of doing this? A few years ago, people were worried about the availability of shipping; now there is plenty and rates are low, although likely to pick up in 2017. More shipping (and storage — as in Singapore) enables spot trading.”

#### For LNG buyers

LNG buyers have to balance several competing priorities. The choice of the right supply depends on their specific needs. Price competitiveness does not always mean the lowest possible price, but a price that is aligned with the buyer’s end market. Supply diversity and flexibility may be achieved by contracting with an aggregator or trader rather than a single project, but possibly at higher cost. Careful consideration of the strengths and weaknesses of projects can guide buyers to which are most likely to proceed to FID, to stay on schedule for completion and to operate reliably once on-stream.

“We are about to enter into a great game of limbo dancing. The global LNG market is going to set a bar and everyone is going to have to dance under it.”

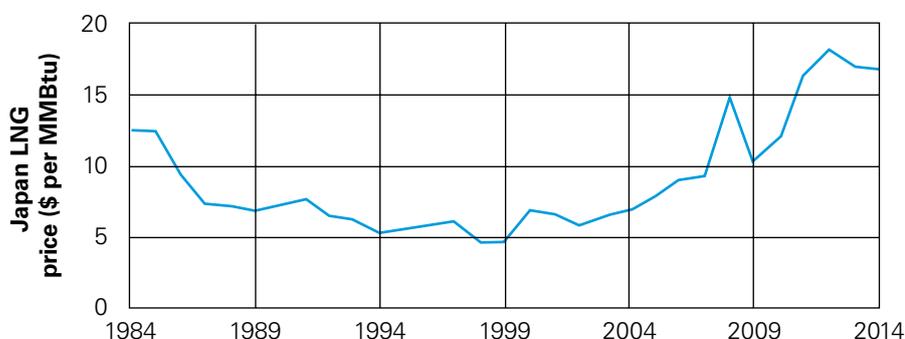
**Andy Williamson,**  
Head of LNG supply at EconGas,  
European Gas Conference

# Conclusion

The LNG industry is cyclical, even more so than many commodity markets. Even with a more flexible industry, LNG projects remain very long-term endeavors that cannot easily adjust to rapid changes in underlying oil and gas prices. LNG output is quite granular — a single large project can add 3 percent or more to global supply, unlike for oil. As the graph below shows, the Japanese

LNG market (the world’s largest) showed a peak-to-trough period of 15 years, with another 14 years to get back to peak. On top of the natural shifts in supply and demand, it is exposed to sweeping and sudden changes in geopolitics, regulation, recessions, economic competitiveness, technology, natural disasters and progress in alternative energy sources.

## Japanese LNG cash, insurance and freight prices, inflation-corrected<sup>11</sup>



It is an unforgiving task to predict the course of LNG supply/demand and pricing. Key trends in the short-, medium- and long-term are as follows.

Short-term	Medium-term	Long-term
<p>The sector is engulfed by global oversupply and comparatively weak demand because of China’s internal energy policy and moderating economy.</p> <p>Moreover, the fact that 75 percent of LNG is still oil-indexed will compound downward price pressure, unless the underlying commodity (oil) bounces back. LNG also needs to be competitive versus coal, in both Europe and Asia.</p>	<p>Prices will eventually pick up on the back of a more liquid and active spot-market, emboldened by heightened demand (including the global push towards de-carbonization following the 2015 Paris talks).</p> <p>New LNG projects are likely to be deferred over the coming years, due to low prices, eroding supply potential. This will eventually set the stage for a rebalancing of supply and demand.</p>	<p>Global gas resources, both conventional and unconventional, remain enormous. Iran’s and Russia’s choices of LNG versus pipeline will have a major impact. US supply could bring a new flexibility, with its innovative pricing and business models, while floating LNG can enable greater speed and flexibility. Canada and East Africa offer greenfield projects with huge, low-cost resource bases, albeit with political and infrastructure challenges.</p> <p>This gas will eventually be brought to market, but it will require both an improvement in prices, and further improvements in technology, project management and commercial arrangements.</p>

In the face of this long-term cyclicity, suppliers — existing and new — have to make sure they can weather difficult times, while being prepared for the upswing. Key approaches are:

Cost discipline	Portfolio flexibility
Strategic patience	Winning partnership

<sup>11</sup> Data from BP Statistical Review of World Energy 2015; prices corrected to 2014 real dollars

# Contributors



**Mary Hemmingsen**  
**Global Leader LNG and National Sector Leader,**  
**LNG and Power & Utilities, KPMG in Canada**

Mary brings over 25 years of experience as an energy business leader in asset management and related business and project development. This includes leadership in the development and delivery of policy, strategy and initiatives for energy, power, utilities and related infrastructure businesses in a range of capacities in both the public and private sectors and for major utilities and global energy and asset managers.



**Brian O'Neal**  
**Managing Director, Oil & Gas**  
**KPMG in the US**

Brian is Managing Director in KPMG's Advisory Services practice with long-standing energy analytics, trading and advisory experience. He has a strong background across multiple commodities, quantitative techniques, trading operations, derivatives accounting and entrepreneurship. He is a frequent speaker at risk management events, and has been interviewed by multiple news agencies. Brian's advisory work has included clients in the US as well as international clients in Canada, Austria, Germany, Italy, Korea, Mexico, Panama, Spain and the UK.



**Jonathan Smith**  
**Partner, Energy & Natural Resources, Oil & Gas Sector Leader**  
**KPMG in Australia**

Jonathan brings over 25 years of experience in systems and process improvement. He specializes in assisting finance leaders in capital intensive industries on performance improvement of finance operations through CFO advisory, financial transformation and cost optimization/transparency. Jonathan has published on the role of the CFO in the development of corporate strategy, cost optimization and developing a cost culture in LNG/coal-seam gas projects.



**Mark Essex**  
**Associate Director,**  
**KPMG Africa International Development Advisory Services (IDAS)**  
**KPMG in Kenya**

Mark is an Associate Director in the International Development Advisory Services (IDAS) of KPMG based in Kenya and leads IDAS work on Energy and Natural Resources (ENR). He is an economist and has delivered numerous economic impact assessments of oil, gas and mining investments across Africa, Asia, Europe, South America and the Caribbean, as well as managing capacity improvement projects for host governments across Africa. Prior to working in the UK and Africa he was a Policy Advisor to the Papua New Guinea (PNG) government on a project to commercialize natural gas assets, a precursor to the ExxonMobil and Oil Search project that became the LNG project completed in 2014, and before this in the PNG Department of Treasury as a Principal Economist.



**Jean Githinji**  
**Senior Manager,**  
**Energy and Natural Resources**  
**KPMG East Africa**

Jean Githinji is a Senior Manager in KPMG East Africa working to expand firm-wide business in the Energy and Natural Resources sector. Jean is a financial analyst and has served as a senior consultant in a number of research studies covering market intelligence on regional operations, market entry and outlook studies, local content development, workforce and skills gap analysis, and related advisory work in the oil and gas sector in East Africa.

# KPMG Global LNG competitive advantage

For today's oil and gas companies, dealing with complexity has become a competitive challenge. Global competition, novel stakeholders and environmental concerns introduce new layers into business decisions.

A leading global provider of professional services to the LNG industry, KPMG member firms have successfully assisted clients in addressing business issues and major risks.

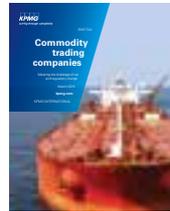
Business issues and risks	KPMG member firm advisory services
<ul style="list-style-type: none"> <li>— Capital projects</li> <li>— Real-time assurance on capital expenditure management</li> </ul>	<p>Managing capital projects, contract processes and providing assurance are the focus of our Major Projects Advisory group.</p>
<ul style="list-style-type: none"> <li>— Risk identification</li> <li>— Enterprise risk management</li> <li>— Outsource or insource?</li> </ul>	<p>Mitigating risks through tools and methodologies that address demand planning, supply and inventory management, strategic sourcing and contract management.</p>
<ul style="list-style-type: none"> <li>— Business operations strategy</li> <li>— Demand side management</li> </ul>	<p>Organizational effectiveness, business readiness for LNG and operational excellence.</p>
<ul style="list-style-type: none"> <li>— Issue recognition and strategy development</li> <li>— Business operations strategy</li> <li>— Capitalizing on different technology investments</li> <li>— Quality reporting</li> </ul>	<p>Designing or improving current business processes, including implementing technology focusing on logistic, supply chain and procurement management, are services that member firms' advisory teams have delivered successfully.</p>
<ul style="list-style-type: none"> <li>— Talent transformation</li> <li>— Business operations strategy</li> <li>— IT projects implementation</li> </ul>	<p>Implementing appropriate size human resource strategies with the right enabling technologies is a key focus area to address labor-related risks.</p>
<ul style="list-style-type: none"> <li>— Major project assurance</li> <li>— Enterprise risk management</li> <li>— Corporate governance improvements</li> </ul>	<p>Utilizing KPMG experts across our global network, advising businesses on implementing governance processes, risk management and ensuring compliance with legislation, including taxation.</p>
<ul style="list-style-type: none"> <li>— Managing major capital expenditure projects and energy investment requirements</li> <li>— Major transaction management</li> <li>— Managing mergers, acquisitions, joint ventures and other third-party relationships</li> </ul>	<p>Project structuring, raising development phase equity, transaction advisory (financial modeling; development of country/project specific contractual frameworks), progressing these to support bankability, including advising in gas sales and purchase, and power purchase agreements. Advisory support can be provided during procurement and financing of capital projects.</p>
<ul style="list-style-type: none"> <li>— Meeting increasing regulatory, government and multiple stakeholder demands</li> <li>— Managing major capital expenditure projects and energy investment requirements</li> <li>— Security of supply</li> <li>— Talent management</li> </ul>	<p>Managing relationships between IOCs and NOCs is critical to ensuring a balance between political and commercial objectives, such as royalty and taxation, security of supply, employment and infrastructure development. We assist IOCs and NOCs in creating a stable and attractive investment environment by developing policy and governance structures.</p>

# Further LNG insights



## Uncharted waters: LNG demand in a transforming industry

The global LNG market is transforming in ways that were unthinkable even 10 years ago. In this outlook on demand we see LNG importers that are becoming exporters and vice versa.



## Commodity Trading Companies

This report, meeting the challenge of tax and regulatory change, is a follow-up to the 2012 report, Commodity trading companies: Centralizing trade. ENR professionals, with the member firms of KPMG International, take stock of the trends and developments that are transforming the commodity trading sector.



## Managing tax in the LNG and FLNG Industry: Lessons from the front lines

Around the globe, LNG and FLNG opportunities are rapidly emerging as fast, cost-effective means of unlocking new gas resources. New technologies and new ways of doing business always bring new tax issues — and LNG and FLNG projects are no exception.



## Major LNG projects: Navigating the new terrain

The LNG industry is approaching an unprecedented wave of expansion as new projects in Western Canada, the US Gulf Coast and East Africa pose technical challenges and, more importantly, non-technical challenges.



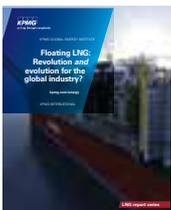
## Unlocking the supply chain for LNG project success

LNG developers are facing the challenges of lower oil and gas prices, and consequent reductions in capital expenditure, along with more remote and challenging projects.



## Is Canada still considered an LNG supplier of choice?

Despite Canada's advantages and world class gas reserves, current global oil and gas industry challenges and uncertainties are buffeting the industry and have reduced investment and Asian buyer appetite. Currently, a perfect storm of global supply side, demand side and related price factors have combined to reduce interest in Canadian and other LNG projects.



## Floating LNG: Revolution and evolution for the global industry?

After a lengthy period of R&D starting in the 1970s, floating LNG (FLNG) plants are on the verge of entering service, with five due to begin operations between 2015 and 19. Sixteen other FLNG projects have been announced as probable and 22 as possible.

For further publications, webcasts, videos and other LNG insights, please visit: [kpmg.com/LNG](http://kpmg.com/LNG)

# KPMG Global Energy Centers

KPMG member firms offer global connectivity. We have 19 dedicated Global Energy Centers in key locations around the world, working as part of our global network. The Centers are located in Aberdeen, Beijing, Berlin, Budapest, Calgary, Dallas, Doha, Houston, Johannesburg, London, Melbourne, Moscow, Paris, Perth, Rio de Janeiro, São Paulo, Singapore, Stavanger and Tokyo.

These Centers enable KPMG professionals to transfer knowledge and information globally,

quickly and openly. With regular calls and effective communications tools, member firms share observations and insights, debate new emerging issues and discuss what is on member firms' clients' management agendas. The Centers also produce regular surveys and commentary on issues affecting the sector, business trends, changes in regulations and the commercial, risk and financial challenges of doing business.

## KPMG member firms 19 Global Energy Centers



## What sets KPMG apart

Our business model enables our network of industry experts to work side by side with business leaders to help develop and deliver strategies or solutions using highly specialized teams tailored to the specific business needs of member firm clients.

**The KPMG Global Energy Institute (GEI):**

Launched in 2007, the GEI is a worldwide knowledge-sharing forum on current and emerging industry issues. This vehicle for accessing thought leadership, events, webcasts and podcasts about key industry topics and trends provides a way for you to share your perspectives on the challenges and opportunities facing the energy industry — arming you with new tools to better navigate the changes in this dynamic arena.

**Register today to become a member of the KPMG Global Energy Institute**

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**The KPMG Global Energy Conference**

**(GEC):** The GEC is KPMG's premier event for executives in the energy industry. Presented by the KPMG Global Energy Institute, this conference is held in Houston and brings together energy executives from around the world in a series of interactive discussions with industry luminaries. The goal of the conference is to provide participants with new insights, tools and strategies to help them manage industry-related issues and challenges.



#KPMGGEC

**Save the date:** KPMG's 14th Annual Global Energy Conference, May 25–26, 2016 at the Royal Sonesta Hotel in Houston, Texas. This year's conference will provide you with critical insights to navigate the structural shift in commodity prices and focus on the role disruptive forces are playing in transforming the energy industry.



## Contact us

**Mary Hemmingsen**  
Global Leader LNG  
and National Sector Leader  
LNG and Power & Utilities  
KPMG in Canada  
T: +1 403 691 8247  
E: mhemmingsen@kpmg.ca

**Brian O'Neal**  
Managing Director, Oil & Gas  
KPMG in the US  
T: +1 713 319 3865  
E: boneal@kpmg.com

**Jonathan Smith**  
Partner, Energy and Natural Resources  
Oil and Gas Sector Leader  
KPMG Australia  
T: +61 8 9263 4895  
E: jesmith1@kpmg.com.au

**Mina Sekiguchi**  
Managing Director,  
Head of Energy & Infrastructure  
KPMG in Japan and Head of Energy &  
Natural Resources  
KPMG in Asia Pacific  
T: +81335485555, Ext. 6742  
E: mina.sekiguchi@jp.kpmg.com

**Tim Rockell**  
Director  
KPMG Global Energy Institute, ASPAC  
KPMG in Singapore  
T: +65 6507 1998  
E: trockell1@kpmg.com.sg

**Mark Essex**  
Associate Director,  
KPMG Africa International Development  
Advisory Services (IDAS)  
KPMG in Kenya  
T: +254 (20) 2806000  
E: markessex@kpmg.co.ke

**Jean Githinji**  
Senior Manager,  
Energy and Natural Resources  
KPMG in East Africa  
T: +254 (20) 3000000  
E: jgithinji@kpmg.co.ke

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