

The outlook for LNG in 2016

– supply growth but where is the demand?

The outlook for LNG in 2016 – supply growth but where is the demand?

LNG supply is set for strong growth in 2016 with ten liquefaction trains, some of which are delayed from 2015, expected to start-up. They will contribute to a surge of 22 mt of additional supply into a global market where demand in the two largest markets, Japan and Korea, which accounted for nearly 50% of global imports in 2015, has been falling. The search will be on for alternative markets to take some of the additional production. European imports will also continue to grow as it acts as the market of last resort for LNG cargoes surplus to the requirements of buyers elsewhere in the world.

The increase in supply will put downward pressure on LNG and natural gas prices, which at the end of 2015 were already at their lowest level since 2009 in Asia and the lowest in over a decade in Europe and North America. It will be a difficult environment for the many liquefaction projects targeting a final investment decision (FID) in 2016. Most will need to reduce costs if they are to achieve economic viability. Gas Strategies looks at the prospects for LNG in 2016 and how players in the industry will respond to the challenges ahead.

LNG prices are expected to remain weak in 2016

LNG and natural gas prices in the main markets will start the year between 35% and 45% lower than they were at the beginning of 2015 (table 1). Futures prices for natural gas and crude oil indicate that any recovery in prices during 2016 is expected to be slow. The Henry Hub futures price was USD 2.87/MMBtu for December 2016 on 8th January 2015 and NBP USD 5.21/MMBtu while Brent crude oil was USD 41.06/barrel.

	Dec 2014	Dec 2015
	in USD/MMBtu	in USD/MMBtu
US - Henry Hub	3.41	1.93
UK - NBP	8.46	5.29
Germany	10.41	5.98
Japan Average Price (Nov)	16.4	8.99
Platts JKM	12.49	7.18
Brent Crude Oil	65.30/barrel	38.97/barrel
NB. Note: Prices are the average for December with the exception of Japan, which is the average for November, since average prices for December 2015 were not available at the time of writing.		
Source: Gas Strategies		

The crude oil price will have the most impact on LNG prices, since over two-thirds is currently sold at prices linked to crude oil and the share is unlikely to change significantly in 2016, despite the start of LNG exports from the US at prices indexed to Henry Hub.

Oil indexation dominates LNG pricing in Asia with JCC (Japanese Crude Cocktail), the index used in the majority of medium and long-term contracts. JCC lags Brent prices by around one month and in many contracts the LNG price is linked to JCC with a lag of three months. As a result, the fall in Brent to under USD 40/barrel in December 2015 will not flow fully through into Asian prices until April 2016, when the average price of LNG delivered to Japan under long-term contract will be around USD 6.6/MMBtu and prices in other Asian markets between USD 6 and USD 7/MMBtu.

Futures prices for Brent increase gradually through 2016, with the September contract currently

quoted around USD 39/barrel, which would lead to Japanese LNG prices around USD 6.50/MMBtu at the end of the year.

Spot LNG prices in Asia and Europe are likely to come under pressure during 2016 as supply increases and demand in key markets Japan and Korea weakens (though this will be offset to an extent by growth in other markets). Some analysts forecast that NBP prices could remain below USD 5/MMBtu in 2016 and that Asian spot prices could fall to USD 6/MMBtu or lower.

A surge in LNG production as liquefaction trains are commissioned and Angola LNG restarts

Nine new liquefaction trains are scheduled to come into operation in 2016 and Angola LNG, which started up in mid-2013 but was shut-down in April 2014 for repairs following a major gas leak, is scheduled to restart.

If all the trains start as planned they will add 42.3 mtpa to the capacity in operation globally at the end of the year (table 2). However, there could be delays even at this late stage of construction, as was the case in 2015.

Twelve months ago, the first five trains listed in table 2 were all expected to come into operation in the third or fourth quarter of 2015 but they were all delayed because the final stages of construction and preparing them for start-up took longer than expected.

Table 2: Liquefaction trains scheduled to start-up in 2016

Country	Project	Start date	Capacity in mtpa
Australia	Australia-Pacific LNG Train 1	Q1 '16	4.5
US	Sabine Pass Train 1	Q1 '16	4.5
Australia	Gorgon Train 1	Q1 '16	5.2
Australia	Gladstone LNG Train 2	Q2 '16	3.9
Australia	Australia-Pacific LNG Train 2	Q2 '16	4.5
Angola	Angola LNG*	Q2 '16	5.2
Malaysia	Malaysia LNG Train 6	Q2 '16	3.6
Malaysia	Floating Liquefaction 1	Q3 '16	1.2
US	Sabine Pass Train 2	Q3 '16	4.5
Australia	Gorgon Train 2	Q4 '16	5.2
	Total		42.3
* Restart after plant shut-down for technical reasons in April 2014			
Source: Gas Strategies			

Australia-Pacific LNG (APLNG) train 1 started to produce LNG on 11 December 2015 and the first cargo left on 9 January on board the Methane Spirit.

Cheniere's Sabine Pass train 1 was originally targeting the start of exports in late 2015. The production of LNG commenced at the end of December and the first cargo is now expected to be loaded by the end of January 2016.

Twelve months ago, the start-up of the first train at the Chevron operated Gorgon LNG was also expected by late 2015 but it is now scheduled in the first quarter of 2016. The plant took delivery of a cargo from Indonesia's Bontang plant at the end of December to cool down the facilities.

In mid-2015, the operator, Chevron, announced that it expected to restart production at the 5.2 mtpa Angola LNG plant in late 2015 and export the first cargo since April 2014 in early 2016 but the schedule appears to have slipped by around three months with Chevron now expecting the start of LNG production towards the end of Q1 '16.

Egypt's SEGAS and Egyptian LNG did not produce any LNG in 2015. Egyptian LNG is being maintained in a state of readiness to restart exports within 24 hours but, with Egypt now talking of needing a third

FSRU to meet domestic demand, it is unlikely that exports will restart in 2016. The civil war in Yemen led to production being halted at the Yemen LNG plant in April 2015 and there are no signs that the situation has improved so a restart in 2016 has low probability.

First floating liquefaction unit due on stream in 2016

This year should see the first floating liquefaction unit come into operation supplied with natural gas from Petronas's Kanowit field offshore Sarawak in Malaysia. At the end of December 2015, Petronas said that the unit was 95% complete and LNG production is still scheduled to start in 2016.

Global production forecast to increase by 22 mt in 2016

The trains starting operation in 2016 are expected to produce around 16 mt of LNG during the year. The remainder of the forecast 22 mt of extra LNG in 2016 will be made up of increased output during the first full year of operation of the four trains that were commissioned in 2015. But there will be some reductions in output from more established plants, including Indonesia's Bontang plant, which, according to the operator Badak LNG, will produce 23 fewer cargoes (1.3 mt) than in 2015 because of lower gas supply.

Overall, output in 2016 from the LNG plants in operation in 2015 is expected to increase by 6 mt, taking global production for the year to around 270 mt, up by 22 mt (8.9%) compared with 2015.

Where will the LNG go?

A key question for the sellers of the forecast 22 mtpa of additional LNG production in 2016 is where will the LNG go? The three Australian projects have most of their output committed under long-term contract to buyers in Asia (Japan, Korea, Malaysia, India and China).

But there will be uncommitted cargoes available during build-up and some of the buyers, including China's Sinopec which has contracted for 7.6 mtpa from APLNG, have overcommitted and are already looking for alternative markets for some of the volumes. There are no contracts in place for the output from Angola LNG, Malaysia's train 9 at Bintulu and its first floating liquefaction unit, while the output from Sabine Pass in the US will be lifted by Cheniere, BG and Gas Natural Fenosa, who will market it as portfolio LNG.

Growing nuclear output erodes LNG demand in Asia

LNG demand in Asia is expected to continue to grow slowly in 2016.

In Japan, LNG use by the power utilities is forecast to decrease as more nuclear power units are brought back into operation. At the end of 2015, two units at Kyushu Electric's Sendai plant were in operation. They are set to be joined in Q1 '16 by Kansai Electric's Takahama 3 and 4 units, after an injunction blocking their restart was lifted by the courts, and by Shikoku Electric's Ikata 3 unit. This will take nuclear capacity online to 4.37 GW and other units could follow during the last nine months of 2016. The output from the nuclear units will initially reduce the burning of crude oil and fuel oil by the utilities but as nuclear output builds up LNG consumption will be hit. It declined by 3.6% in 2015 and a further reduction in 2016 could see it down to 80 mt, 8.5 mt lower than the peak in 2014.

Nuclear power is also a factor in the decline of South Korea's LNG demand as new units are added. The start-up of the 1 GW Shin Wolsong 2 unit in July 2015 contributed to the 11.4% decline in Korea's LNG imports in 2015 along with the increased use of cheap coal in the power sector, less extreme weather conditions and faltering economic growth. LNG consumption in the power sector will continue to decline as the 1.4GW Shin Kori 3 nuclear unit comes on-line in April 2016. Taiwan is the

only one of the three traditional LNG markets in Asia (Japan, Korea and Taiwan) to increase its LNG imports in 2015, but growth may slow in 2016 following the restart of a nuclear unit that was off-line for much of 2015 and the commissioning of the first 800MW ultra super-critical coal-fired units at the Linkou power plant.

China's LNG imports increased rapidly between 2006 and 2014 but 2015 saw LNG consumption down by the equivalent of 4 cargoes (0.27 mt) from a year earlier, as natural gas demand growth slowed from over 10% per annum to an estimated 2.7% in the first nine months of 2015. The volume of LNG contracted by China's three government owned oil and gas companies, CNOOC, CNPC and Sinopec, will increase by 8 mtpa to 31 mtpa in 2016 as new trains in Australia come on stream. China's receiving terminals operated at around 50% of capacity in 2015 and a further 14 mtpa of regasification capacity is due to start-up in 2015 (table 3) taking the available capacity to around 54 mtpa. However, with slower demand growth and competition from pipeline gas imports and domestic production, contracted LNG is well in excess of demand leaving the three main importers seeking buyers for some of the LNG they have committed to purchase.

Europe, India and South East Asia – the main markets for additional production

The growth in Asian LNG demand in 2016 will be mainly from South East Asia and India, offsetting the region's weaker demand in Japan and Korea. In aggregate Asia is unlikely to require more than 5 mt of the additional 22 mtpa of production in 2016 leaving 17 mt available for markets elsewhere in the world.

Pakistan, Egypt and Jordan, which started receiving LNG using FSRUs in March, April and May 2015 respectively, imported a total of 5.74 mt last year. This could increase to 10 to 12 mt in 2016.

Kuwait and Dubai, which have extended imports from the summer months to all year round, are also expected to import more LNG in 2016 after an increase of 1.4 mt (33%) in 2015. The prospects for growth in imports into Latin America are less certain. Mexico's imports are declining as pipeline imports from the US increase while Brazil's imports depend on rainfall.

The only two countries expected to start importing LNG in 2016 are Ghana and Colombia. The demand in both countries will probably build slowly and they are unlikely to have the impact that Pakistan, Egypt and Jordan had in 2015.

Europe, as the market of last resort for the LNG cargoes that are not required in other markets, could see the delivery of between 6 mt and 10 mt of additional LNG in 2016, taking the volume for the year to 44 to 48 mt. There is a growing expectation that a significant share of the output from US liquefaction plants will be targeted at Europe. Qatar increased the volume of LNG delivered to Europe by 3.2 mt in 2015 as its spot and short-term sales to Asia were displaced by LNG under long-term take-or-pay contracts from new liquefaction trains in the Pacific basin, a trend that is expected to continue in 2016.

Poland will be a new market in Europe for LNG after it received a commissioning cargo from Qatar at its Swinoujscie terminal in December. The terminal is expected to start commercial operations in Q2 '16 when regular deliveries under its 1 mtpa contract with Qatar will commence.

Europe has ample spare capacity at its receiving terminals to increase its imports. Terminals have been operating at around 25% of capacity and the commissioning of EDF's Dunkirk terminal in Q1 '16 will add a further 10 mtpa of capacity. Key issues are how Russia will respond if its market share in Europe is threatened by increased LNG imports and what impact they will have on natural gas prices across the continent.

New LNG Import Capacity in 2016

A total of 31.1 mtpa of import capacity is due to be commissioned in 2016 (table 3). It is less than the new liquefaction capacity that is scheduled to be commissioned but there is spare import capacity in most markets so it will not be a constraint on production. China accounts for 46% of the new import capacity but, as discussed above, it is unlikely to need it in the short to medium term with its existing terminals operating at around 50% of capacity.

The two new importers, Ghana and Colombia will use FSRUs provided by Golar LNG and Hoegh LNG respectively. The capacities shown in table 3 are based on the capacity of the regasifiers on the FSRUs but it is likely that actual throughput will be much lower.

Table 3: LNG receiving terminals scheduled to start-up in 2016		
Country	Terminal	Capacity in mtpa
China	Yuedong/Jieyang	2.0
China	Beihai	3.0
China	Dalian Expansion	3.0
China	Guangdong Dapeng Expansion	2.3
China	Diefu	4.0
France	Dunkirk	10.0
Colombia	Cartagena*	3.0
Ghana	Tema*	3.8
Total		42.3
* Terminals using an FSRU		
Source: Gas Strategies		

It is possible that there could be further import facilities developed at short notice in 2016 since six ships with on-board regasifiers are currently either inactive or are operating as conventional ships trading LNG. The availability of uncommitted LNG and lower prices could put some of the many countries that have been talking about LNG imports in a position to go ahead with their projects.

Final investment decisions (FIDs) on liquefaction capacity in 2016

FID is being targeted on 92.5 mtpa of capacity in 2016 (table 4), similar to the level in the previous three years. The success in achieving the targets for FID has been in decline – it was just 19% in 2015 compared with 27% in 2014 and 29% in 2013.

Most of the projects shown in table 4 were also on the list in 2015, the only exceptions are LNG Canada, Douglas Channel LNG and Goldboro LNG in Canada and Equatorial Guinea's Fortuna LNG. The success rate in 2016 is unlikely to be better than in 2015 and it could be 10% or lower, since all the projects shown face major challenges in the current low price environment.

Although the US projects do not take price risk, they will find it difficult to secure buyers or off-takers willing to commit to a 20-year contract, especially since the liquefaction fee, which typically amounts to USD 150 to USD 175 million per year for each 1 mtpa of capacity, is on a use-or-pay basis.

In early December 2015, the projects best placed to take FID in 2016 appeared to be Cheniere's Sabine Pass train 6 and Corpus Christi train 3. They are both expansions of projects under construction and they have all the necessary permits in place from the Federal Energy Regulatory Commission (FERC) and the US Department of Energy. However, following the ousting of Charif Souki as CEO, Cheniere may now focus on commissioning and operating the seven trains that it has under construction to generate profits for a company that has been loss-making since it first announced its plans to enter into the LNG business 15 years ago.

For the sponsors of many of the projects targeting FID in 2016 a reduction in costs will be essential to achieve economic viability (see “Lower for longer: pressure mounts to cut project costs”, as well as upcoming LNG Business Review article on the escalating costs of LNG liquefaction projects). There have been indications that the collapse in the oil price has resulted in reductions of around 10 to 15% in cost but more will be needed, which means that there will be pressure on contractors and equipment suppliers to find ways of taking more cost out of project construction costs.

Country	Project	Capacity in mtpa
US	Sabine Pass Train 6	4.5
US	Corpus Christi Train 3	4.5
US	Magnolia Trains 1 to 4	8.0
US	Jordan Cove	6.0
US	Elba Island	2.5
US	Lake Charles	15.0
Canada	Pacific North West	12.0
Canada	Woodfibre	2.1
Canada	LNG Canada	12.0
Canada	Douglas Channel LNG	0.6
Canada	Goldboro' LNG	5.0
Mozambique	Coral FLNG	2.5
Mozambique	Mozambique LNG	12.0
Equatorial Guinea	Fortuna LNG	2.0
Indonesia	Tangguh Train 3	3.8
	Total	92.5
<i>Source: Gas Strategies</i>		

Short-term charter rates for LNG ships unlikely to rebound in 2016

Thirty-nine ships are due join the global LNG shipping fleet in 2016, including four FSRUs. They will increase the capacity of the fleet available for transporting LNG (i.e. excluding FSRUs) by 9.6% (5.91 million cubic metres). This is more closely aligned with the forecast increase of 8.9% in LNG production than was the case in 2014 and 2015, when the increase in shipping capacity was well in excess of the increase in LNG production. The result was a decline in short-term charter rates in 2015 to USD 30,000 to USD 35,000/day for modern ships with diesel engines and USD 18,000 to USD 25,000/day for older steam turbine ships.

A number of these older ships went into lay-up in 2015 because charter rates barely covered operating costs. Some of the around 55 ships with steam engines that are over 25 years old and are still actively trading LNG may be put into lay-up or scrapped in 2016.

The closer balance between the increase in shipping capacity and LNG production and the potential the retirement of older ships will probably result in some upward movement in short-term charter rates, which ship-owners will welcome. However, it is unlikely that rates will reach the USD 60,000 to USD 80,000/day needed to cover operating costs and remunerate the capital investment in a new ship.

Most of the ships that are due to leave the yards in 2016 have been chartered by buyers or sellers to lift the output from projects that are due to start-up in 2016 or 2017. They include the first of 15 ice-breaking tankers that are being built in the Daewoo yard in Korea for Yamal LNG. The ship will come into service more than a year in advance of the start-up of the project, which the operator, Novatek, says is on course for first production in late 2017, to allow experience to be gained of operating ice-breaking tankers in Arctic conditions.

Six of the ships scheduled to join the fleet in 2016 do not as yet have confirmed employment, a much smaller share of the ships coming into service than was the case in in the last two years. The world's largest FSRU, the 263,000 cm unit ordered for the planned Uruguay project, is due to be completed in 2016. However, the future of Uruguay's plans to import LNG is uncertain following the withdrawal of Marubeni and Engie as project developers in 2015.

At the other end of the scale, Exmar will take delivery of a 25,000 cm FSRU built by China's Wison yard. Exmar has not said where the unit will be used. Hoegh LNG and BW Maritime are each due to take delivery of a 170,000 cm FSRU. Hoegh's has been chartered for the import project at Cartagena in Colombia while BW's has yet to secure employment.

LNG contracting in 2016

The year 2016 will be a busy one for negotiators as a number of contracts approach expiry and discussions start on renewals, price review provisions are invoked, projects planning to take FID in 2016 or 2017 seek commitments for buyers or off-takers and those projects that have non-binding agreements try to turn them into binding contracts to support financing.

It will be an environment in which buyers and off-takers are in a strong position because of the volume of uncommitted LNG that will be on offer from aggregators, projects with uncommitted capacity from expiring contracts that have not been renewed or from new plants that operate above design capacity. Spot prices, which are currently lower than prices in long-term contracts may be a trigger for buyers to call for price renegotiations outside the terms of contractual price review clauses.

Petronet and RasGas have set a precedent with their renegotiation of their 7.5 mtpa long-term contract after Petronet reduced its off-take because the contract price was at a large premium to spot prices. RasGas's agreed to waive take-or-pay liabilities and to accept a new pricing formula with Petronet agreeing to abide by the contract provisions and make-up the LNG not taken in 2015 and to purchase an additional 1 mtpa at the new contract price. It is an indication that sellers and buyers have little choice in these circumstances but to find a solution to the problem acceptable to both parties if the relationship is to be maintained. We could see further contract renegotiations in 2016 as buyers and sellers adapt to the new market environment.

Price will always be a key issue in any contract negotiation but destination flexibility is increasingly important to buyers who are facing much greater uncertainty of demand in their downstream markets and need the ability to divert or trade cargoes surplus to their needs.

The start of exports from the Lower-48 states of the US will bring new pricing dynamics into the market and LNG with none of the destination restrictions that are still found in many contracts. The duration of contracts will continue to come under pressure as buyers increasingly seek short and medium term contracts thereby reducing the role of the 20-year plus contracts with end-user buyers that have underpinned the development of the LNG business for over 50 years. However, some projects still need long-term contracts to underpin the financing of their project and they may have to turn to aggregators rather than the traditional gas and power utility buyers.

2016 will be a year of growth and change

The coming year is set to be one of strong growth in the LNG business as 42 mtpa of new capacity comes on stream to add to the total of 26 mtpa commissioned in 2014 and 2015. It comes into a market where creating the demand to absorb the new supply will be a key challenge. Europe and new markets will be the main beneficiaries, continuing the trends that developed in 2015.

There has been considerable change in the LNG business over the last decade. Reducing both capital and operating costs will be a major challenge for the developers of new projects, some of whom will be looking for ways of creating demand through investing in receiving terminal facilities in partnership with buyers.

Buyers and sellers will also have to work together to develop contracts that recognise the changes that are taking place in natural gas markets around the world.

Pricing, volume and destination flexibility and shorter contract durations will be high on the agenda for buyers.

Sellers will have to respond in a way that ensures that projects still generate the cash flows needed to generate returns to remunerate the investment.

There can be no doubt that 2016 will be another year of change for the LNG business and one where change gathers momentum.

About Gas Strategies

Gas Strategies is a global specialist professional services organisation providing commercial energy advisory services across all continents, through consulting, training and information services.

We are proud to have worked alongside industry leaders on high profile projects throughout the world, pioneering a number of breakthrough developments and continuing to encourage innovation from both our clients and ourselves.

**Consulting**

+44 (0) 20 7332 9900
consult@gasstrategies.com

**Alphatania Training**

+44 (0) 20 7332 9910
training@gasstrategies.com

**Information Services**

+44 (0) 20 7332 9976
subscriptions@gasstrategies.com