

Unlocking global LNG market value

Market changes require portfolio transformation



Global LNG trade in 2014 reached around 240 mtpa, only a 1% increase over 2013 and still below 2011 levels. But the global LNG industry is not stagnating. An interesting story is emerging beneath these headline figures, one of increasing volumes of short-term contracts and spot sales, which have grown from around 17% of LNG sales in 2010 to about 30% by 2014. Further, with LNG supply volumes coming to market this year from new US sources, a physical link from Henry Hub is now emerging for the first time between the various regions around the world. Coupled with lower gas demand in many markets, this is leading to a buyers' market in the short-term, and only those players having a truly global reach will be able to take advantage of price arbitrage opportunities, seeking temporary pockets of high value during this period of low natural gas prices.

Demand uncertainty

This was supposed to be the "Golden Age of Gas." Recent policies in Europe have encouraged the use of renewables, with gas being the obvious complementary source of energy for power generation, able to react quickly when these intermittent sources need backup power. Natural gas is the cleanest of the fossil fuels, having lower emissions than either coal or oil-fired power generation. Gas supplies, including shale-gas, are globally abundant, and with the capital cost of gas-fired power generation plant being lower than that of either coal or nuclear capacity - all forecasts suggested that gas demand would increase.

But gas demand in Europe has not risen. From 2005 to 2014, gas demand in fact **decreased** in Europe by around 13%. Gas demand in Japan (the largest LNG importing nation) is also now forecast to drop this year.

In Europe, with increasing renewables capacity, coal and gas have been competing for the ever-decreasing share of fossil fuels in the electricity generation mix. The US shale-gas revolution has resulted in more cheap gas supplies in the US, with a consequent slump in US coal demand and coal prices. This US coal has therefore been exported in recent years, driving global coal prices even lower and encouraging European utilities to burn coal rather than gas.

In Japan, natural gas is no longer the prized fuel. More coal is now forecast to be used in power generation due to the global

supply glut and lower prices. More clarity over the possible restart of nuclear generators should emerge this year, with nuclear plant possibly restarting within the next 12 months. Further, the recent drop in the oil price has even encouraged some power generators to burn oil. Coal, nuclear and oil are thus all producing electricity at the expense of natural gas.

In China, a slowdown in the growth rate of total primary energy use has affected gas demand growth, leading to a wide range of gas demand forecasts to 2020.

Supply uncertainty

Faced with a potentially extended period of low gas prices, the substantial gas reserves known to exist in East Africa, the Eastern Mediterranean, Alaska and Australia now seem unlikely to be developed in the near-term.

This may raise questions about mid-term gas supply, but in the short-term, gas supply is still increasing as new liquefaction plant comes onstream to meet the previously anticipated demand growth. The IEA forecasts that some 164 bcm per year of new LNG capacity will be added to the market by 2020, of which 90% will come from the US and Australia:

- US LNG exports will begin by end 2015, with Sabine Pass being the first of four liquefaction plants now under construction. The other three plants will bring North American export capacity to around 45 mtpa (approx. 60 bcm pa) by 2017/18.

- Australia's LNG exports will also continue to increase in 2015, with 25-30 mtpa (approx 35-40 bcm pa) coming onstream this year, including the Gorgon, Australia Pacific and Gladstone liquefaction plants. Prelude and Ichthys are both under construction, due onstream in 2017.

This new LNG supply capacity, coupled with lower gas demand, has resulted in a significant potential gas market oversupply, impacting the schedule of the many LNG developments yet to reach Final Investment Decision (FID) and for which the timescale is as yet unclear:

- Many US liquefaction projects are not yet permitted, with the potential supply glut likely to cause further FID delay (including Exceleerate's Lavaca Bay).
- The growth of Australian LNG has been disrupted: Arrow LNG and Bonaparte FLNG have been cancelled, while Browse FLNG has been "rephased".

The mid-term outlook for gas supplies in the rest of the world is also uncertain. Two Russian liquefaction plants (Sakhalin 2 and Far East LNG) are both due to reach FID in 2015. Current economic sanctions against Russia have meant that the financing of Yamal LNG is unclear (though it may now be financed by China).

Supply from existing capacity is also unclear. Despite having export infrastructure in place, Egypt was importing LNG in 2014, though BP has announced its development of the 5 tcf West Nile Delta project.

Supply also seems uncertain in the longer-term. Iran has ambitions to supply the Middle East and Europe, and has recently announced the potential construction of three new export pipelines, to coincide with a doubling of production capacity from the South Pars field. The timeline for this supply is also unclear however.

Without a change to current policy, China's shale-gas ambitions are unlikely to develop for the next decade or so (and the recent long-term contracts with Russia are likely to meet most of China's growing gas demand by 2020). Accordingly, the IEA predicts that China will take around 25% of all new LNG supplies coming to market by 2020.

The potential for global gas price convergence

Global gas price convergence, which the IEA predicted last year would take more than a decade to develop, is therefore anticipated to occur this year instead.

When Japanese oil-indexed gas prices reached around \$18/MMBtu last year, it was commonly acknowledged that these prices were unsustainable, and that they would drop once new

supplies came onstream and the "tightness" in the LNG market was eased.

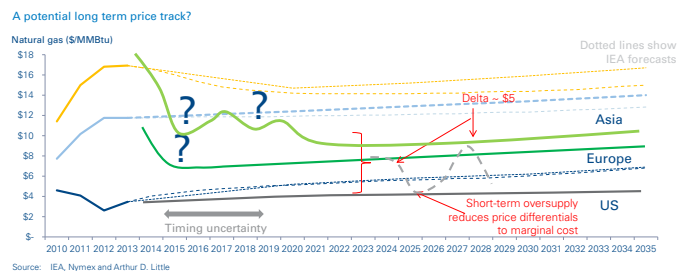
The new, long-term FOB contracts from US facilities at Sabine Pass, Freeport and Cameron reportedly price gas at 15% above the Henry Hub price, plus between \$3 and \$3.5/MMBtu for liquefaction. Assuming trans-Pacific shipping costs of around \$1.50 to \$2/MMBtu, these new US export contracts could deliver gas at around \$8 to \$9/MMBtu, ex-ship. Last year, it was expected that oil-indexed prices would eventually be reduced to this level via price reviews and political pressure. Asian buyers and policy makers were already sending clear signals to the market that they were unwilling to continue paying the world's highest gas prices for their LNG imports.

The current low oil price has dramatically changed the outlook for oil-indexed gas prices. Long-term Japanese LNG prices have significantly decreased in recent months, several years earlier than anyone predicted. From the \$18/MMBtu highs of last year, long-term oil-indexed prices had crashed to around \$10/MMBtu by the end of Q1 2015, with spot prices at less than \$7/MMBtu. In fact, with the indicated excess of supply, LNG shipping rates now stand at just over a third of their rate of three years ago, at only \$50,000 per day.

As a direct result of the increase in short-term LNG trading, and the relative over-supply of gas, one single global gas market is thus now emerging from the previously fragmented sub-markets, even if perhaps by chance rather than by design. For example, if oil prices stabilize at around \$70/bbl in the short to mid-term, then it appears that the prices of LNG delivered to Japan under oil-indexation will converge with the prices of Asian deliveries under Henry Hub indexation.

Given this environment, it is Arthur D. Little's view that, once buyers have enjoyed the extended period of low prices and the price convergence that is now expected, both between regional hubs and between spot versus oil-indexed prices, it is unlikely that they will tolerate sustained future supply diversion, leading to regional gas price spikes. Indeed, if oil prices do rise again, we may anticipate further price reviews, away from oil indexation in the remaining long-term contracts, with policy makers being called upon to maintain downward pressure on prices.

Economic theory suggests that gas price differences between markets should only reflect the cost of transporting gas from one market to another. A completely stable price differential is unlikely, in reality, as short-term supply and demand dynamics will cause temporary price differentials to both increase and decrease for varying periods. It is these temporarily high prices which provide the market signals for players to react and extract value.



The winners and losers

Those LNG players able to cover their marginal costs of supply will survive in the short-term when prices are low. Conversely, those high-cost projects which reached FID on the prospect of high Asian gas prices lasting until the 2020s will probably have to lower their expectations for project returns quite substantially. Their key focus today must be on cost reduction for both construction and operations.

A decade ago, players with import positions on both sides of the Atlantic engaged in trans-Atlantic arbitrage, as prices spiked on a seasonal basis between the UK and US. LNG moved between the two locations. Clearly still, when short-term price spikes appear, due perhaps to weather-related or operational supply difficulties, it is those companies with a global reach that will best be able to take advantage of price arbitrage opportunities. Indeed, with higher levels of LNG trading, with the US entering the LNG export market and the additional Australian exports, such arbitrage opportunities are becoming more substantial and more global in nature. Global reach is therefore increasingly the key to unlocking success in this transformed market.

For example, despite the current period of generally lower gas prices, there have already been price-spikes in low-priced markets. In the US last year, where Henry Hub prices have been around \$3/MMBtu, eight LNG cargoes were delivered (almost exclusively from Trinidad) which achieved prices in the \$10 to \$17/MMBtu range.

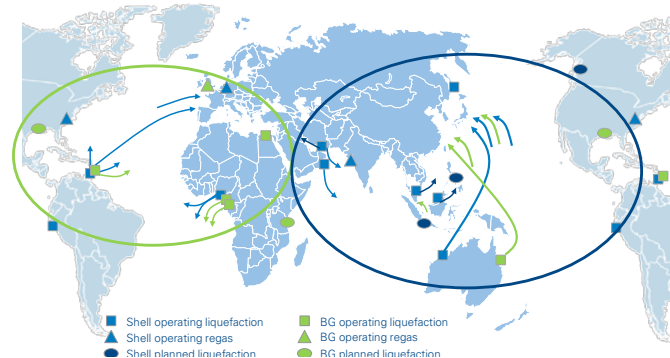
Majors selling from a global supply portfolio

LNG players with global reach are therefore able to take the most advantage of arbitrage opportunities by adopting innovative portfolio designs. With global liquefaction positions, some players are able to optimize their portfolios and ensure buyers needs are met, whilst minimizing transport costs and maximizing margins for any spot volumes.

The Shell/BG merger, for example, combines two of the world's largest LNG portfolios. Together they accounted for around a fifth of global LNG imports in 2014. Consolidating these portfolios increases still further their LNG trade optionality, with BG's recently online Queensland Curtis LNG, and other projects under construction, including Gorgon and Sabine Pass, due onstream later this year.

- Shell also bought Repsol's LNG business in 2014, adding new positions in South America.
- Shell's recent contract with Chubu Electric of Japan sources gas from Shell's overall portfolio, rather than a single source. With global liquefaction positions, Shell is able to optimize its portfolio and ensure buyers needs are met, whilst minimizing transport costs and maximizing margins for any spot volumes.
- BG operates a similar "portfolio" contract structure.

LNG positions (Shell Pacific led, BG Atlantic led)



Such a portfolio contracting structure is also apparent in BP's recent long-term contract with Kansai Electric, where gas is supplied from BP's diverse portfolio of LNG sources.

Buyers with destination flexibility

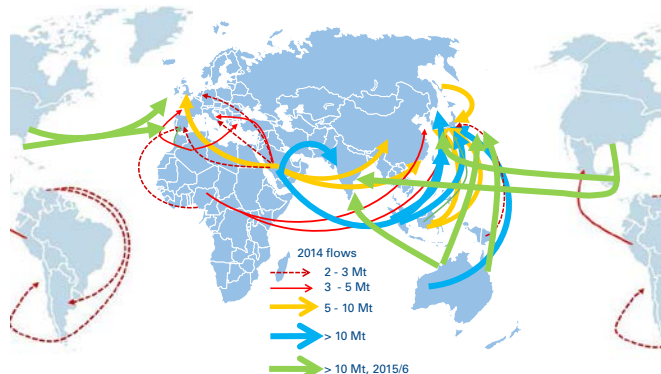
Traditional Asian LNG contracts restricted the sales delivery point, but more recent US export contracts have no such destination clauses. Buyers with LNG contracts containing destination flexibility will therefore emerge as potentially significant winners who may be able to enter the trading arena, and re-export excess volumes to other demand centres, including both Asia and Europe.

Transforming their businesses into major gas trading organizations will take changes in culture, governance, and risk management systems. It is unclear to what extent such Buyers (especially the Asian utilities) will have the appetite for such a transformation and partnering with more experienced global companies may be one solution for them.

LNG trading patterns will also change. European utilities will no longer re-export LNG volumes to Asia (Europe accounted for 95% of all global re-exports in 2014, with 75% going to Asia). Asian LNG now looks certain to be re-exported, possibly back to Europe. If European carbon pricing policies are modified and gas demand increases, this shift may in fact be inevitable. Indeed, as Europe looks to diversify away from Russian gas supply (and Russia seeks to diversify its demand), and with the recent compromise of North African pipeline imports to Europe, LNG will be needed to cover any European demand growth. The IEA's

recent forecasts in fact show Europe's LNG imports doubling from 2014 to 2020.

LNG trade flows



The LNG market in a period of excess gas supply

The long-anticipated convergence of global gas prices has therefore arrived, for now. Stable, long-term price differentials between markets that are set by the long-run marginal costs of transporting gas from one region to another have become a step closer, though pockets of price volatility, depending on regional factors, will undoubtedly remain.

The winners will be those industry players with a global reach, able to transform their trading portfolios in a way that enables them to take advantage of any temporarily high priced spot market prices. And these winners may not just be dealing in physical volumes: if the forward curve is indeed undervalued on a mid-term basis, as various commentators have suggested, then the global financial traders may well continue to enter the LNG trading arena as liquidity increases.

Trading and risk management skills are required wherever there is market liquidity. Entering a period of excess gas supply will lead to an increase in trading, churn rate, and the development of new regional spot markets. Players will have to transform their trading skills in order to take advantage of this new liquidity, with some level of trading capability being essential in order to minimize costs and control margins. Trading provides price discovery for asset acquisition. It identifies arbitrage opportunities, and finds temporary high value points along the value chain where assets can provide real value.

With gas prices at their lowest for a decade a period of industry consolidation and further innovative business models in the LNG industry may be arriving, with the Shell/BG merger being just the first of several consolidation moves along the value chain.

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