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LNG EXPORTS: OASIS OR MIRAGE?



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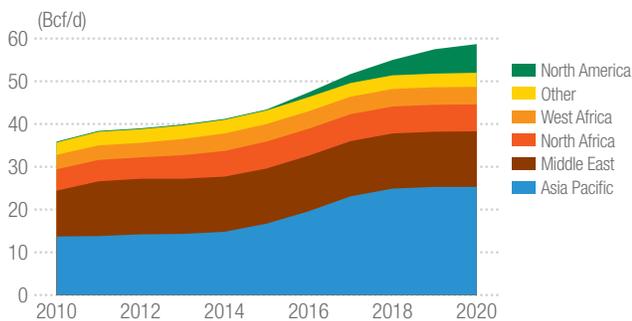
LNG EXPORTS: OASIS OR MIRAGE?

LNG exports have long been touted as the metaphoric savior of the US gas markets, tempting producers and midstream players with the allure of global demand. However, global gas demand growth has flagged over the last year, rising by a mere 0.7 Bcf/d, while at the same time 2.2 Bcf/d of new export capacity is expected to be added to the market by the end of 2015. LNG spot prices have slipped back into territory not seen since prior to the 2011 Fukushima disaster, which led to Japan shuttering 47.5 GW of nuclear generation capacity. The recent dip in global LNG prices may be just the beginning of a longer-term trend of well supplied LNG markets, which could leave many LNG export terminals in the US underutilized and global gas markets wading through a protracted period of depressed prices.

By 2018, global liquefaction capacity is set to grow by 13.8 Bcf/d (28%) over 2014 levels, with 10.5 Bcf/d of that growth occurring outside of North America. Australia is leading most of that build, with liquefaction capacity expected to expand to 11.5 Bcf/d in 2018, more than doubling 2015 capacity. (See Figure 1). With all of this capacity set to come online in the next four years, it begs the question: Can the global gas markets absorb this much additional LNG?

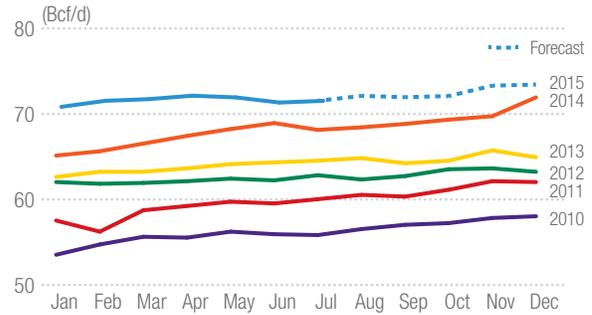
Eclipse Energy, a unit of Platts, estimates that global baseload demand will only rise by 3.3 Bcf/d in 2016, whereas global supply is expected to increase by 4.3 Bcf/d, leaving the global market about 1 Bcf/d longer by the end of the year. The primary assumptions driving this lack of demand growth are an expected 15 GW of nuclear restarts in Japan by mid-2017, a substantial buildout in coal and nuclear generating capacity in South Korea between 2016 and 2018, and uncertainty surrounding Chinese gas demand and economic growth. Combined, these three countries are expected to account for 40% of all demand growth in 2016 and 60% of aggregate global demand. With supply growth expected to outpace demand, the Asia Pacific market is expected to transition from high spot market dependency to becoming fully contracted in the 2016- 2018 period.

FIGURE 1. GLOBAL LIQUEFACTION CAPACITY



Source: Eclipse Energy Group

FIGURE 2: US DRY GAS PRODUCTION



Source: Bentek Energy

In the US, gas production has been increasing rapidly over the last five years. Despite vast quantities of reserves being accessible below \$4/MMBtu, new demand sources are required to maintain growth. US dry gas production has averaged 72.3 Bcf/d year-to-date, 4.4 Bcf/d more than 2014 (See Figure 2). In the last three years, US production has grown by more than 10 Bcf/d, which, among other things, has pushed prices back down to 2012 levels and allowed gas-fired power generation to overtake coal as the US' primary electric generation fuel this summer. As new pipeline infrastructure adds takeaway capacity to constrained Northeast producing basins, Bentek expects that US production will again reach new all-time highs at the end of this year, breaking above 74 Bcf/d as early as November. For the oversupplied US gas market, global LNG markets held the promise of pent up demand, without which US gas production may face contractionary pressure.

While the start of the first train at Sabine may signal the beginning of the end of US gas oversupply for some, it may come to pass that US exports begin just as the global market starts to wrestle with its own deluge of supply. Bentek expects that five LNG export terminals will ultimately be built in the US over the next five years boasting a combined liquefaction capacity of 10.16 Bcf/d (See Figure 3). Sabine Pass will be the first project

FIGURE 3. US LNG EXPORT FORECAST

Terminal	Liquefaction capacity (Bcf/d)	Expected first exports
Sabine Pass T1-5	3.50	Feb-16
Cove Point T1	1.00	Jun-18
Cameron LNG T1-3	2.10	Jul-18
Freeport LNG T1-3	2.16	Jan-19
Corpus Christi T1-2	1.40	Jul-19

Source: Bentek Energy

to begin commercial exports of LNG overseas. Exports are on track to begin early next year. Between 2016 and mid-2018, Sabine Pass will be the sole outlet for US LNG (See Figure 4). The projects that Bentek expects to reach completion have all necessary US Federal Energy Regulatory Commission and Department of Energy approvals, nearly all have received a final investment decision, and all trains projected to go forward are fully contracted.

These five facilities represent about a fifth of the total proposed liquefaction capacity that has been announced in the US and, once built, will represent around 10% of global liquefaction capacity. Few of the projects outside Bentek's forecast have received all the necessary exports approvals, and fewer still have secured binding offtake agreements, without which the projects will be unable to receive financing. With the global LNG market expected to be well-supplied over the next five years, it appears unlikely that many new buyers will enter the market for additional US supplies being delivered before 2023. Therefore, there will likely be a lull in new LNG offtake contracts with US export facilities for the next several years, effectively stalling the development of the US LNG export market in the near term.

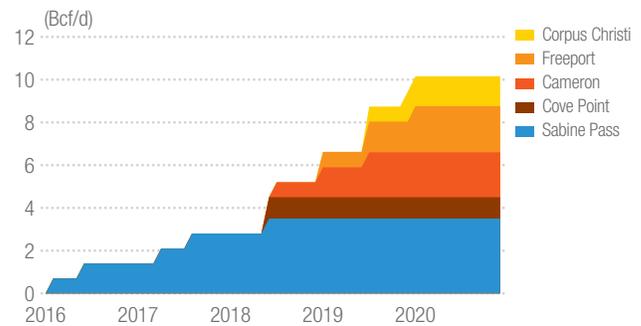
Broadly speaking, US LNG export capacity holders can be split into two groups: utilities and portfolio marketers. Utilities are characterized as capacity holders that own downstream demand assets and have fairly concrete and predictable gas requirements. Though, even for utilities, over-contracting may still be an issue. In contrast, portfolio marketers generally do not own downstream demand assets and have purchased capacity with the intent of selling LNG on the spot, short-term and long-term horizons.

Despite most US LNG export facilities having secured contracts for more than 80% of their available capacity, there remains a distinct risk of underutilization over the next five years, particularly during periods of low global demand. Underutilization will largely be a risk to capacity held by portfolio markets, which do not necessarily have access to firm downstream demand, whereas utility demand is expected to be more certain. Utility marketers make up about 44% of total US export capacity, whereas portfolio marketers make up around 37%. The remaining 19% is currently unsubscribed and will likely be marketed by the export facilities themselves, making it essentially another form of portfolio capacity (See Figure 5).

In an environment with plenty of length in the global LNG markets, which we appear to be entering, portfolio marketers may have to compete to deliver the marginal cargo into demand markets. This would typically occur when global demand is low and there is plenty of length in the spot market. Under those circumstances, US export capacity holders are likely to operate without regard to their sunk cost tolling fees and deliver gas at a cost of feedstock + transport + margin.

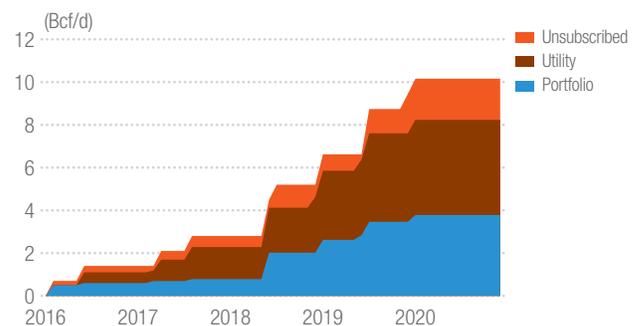
As new US supplies begin flowing into the market and driving down prices, new demand will be triggered regionally. These regional price supports include the

FIGURE 4. US LNG EXPORT CAPACITY



Source: Bentek Energy

FIGURE 5. US CAPACITY HOLDERS



Source: Bentek Energy

Asian Coal Switching Price the European Coal Switching Price, wherein domestic power producers will forego coal-fired generation in favor of cheaper gas-fired generation if LNG prices fall low enough, thus creating price support in the form of additional demand. The marginal cost of delivering gas from the US into Asia and Europe is also set to become an important price support between now and 2020 during periods where supply far exceeds demand. When global spot prices fall below the marginal cost to deliver a US LNG cargo to market (ignoring sunk costs), a US capacity holder may forgo their option to liquefy, thus depriving the market of supply and supporting prices. This optionality of US LNG exports, wherein supply can be turned "on" or "off" in response to price, will become a key price signal over the coming years, informing markets when additional US supply is needed and shutting in US supply during times of low demand.

Year-to-date, spot LNG cargoes delivered into Asia have fetched an average price of \$7.55/MMBtu, down 50% from a year ago. At the same time, long-term contracts, which are traditionally indexed to oil, fell to an estimated \$8.59/MMBtu, a 47% drop from last year. Spot cargoes, as measured by the Japan Korea Marker (JKM), have traditionally traded below the long-term oil-indexed price, with winter demand swings that drive the spot price above the long-term contract price. During the winters of 11-12, 12-13 and 13-14, spot prices averaged \$17.11/MMBtu, \$0.55/MMBtu stronger than long-term prices. Last winter,

however, spot deliveries into Asia averaged \$7.55/MMBtu, \$0.20/MMBtu weaker than the long-term price (See Figure 6).

Firstly, this winter inversion of spot versus long-term pricing indicates that the market was in fact oversupplied and buyers unwilling to enter the spot market to buttress winter supplies. Secondly, and perhaps more importantly, it suggests that a “decoupling” may be occurring between long-term oil-indexed supply and short-term/spot supplies. Looking further back, we can see that spot LNG has, at times, traded at a significant discount to long-term oil-indexed supplies. Between 2010 and mid-2011, the spot price for LNG cargoes delivered into Asia averaged \$9.03/MMBtu, 32% lower than the long-term cargoes. During that time, spot LNG cargoes were priced more in line with the European market (NBP), which absorbed much of the additional length in the global LNG markets and acted as a price floor for LNG. Earlier still, in 2009, we can see that the US market (Henry Hub) was the price floor, absorbing global supplies at a myriad of recently commissioned import terminals.

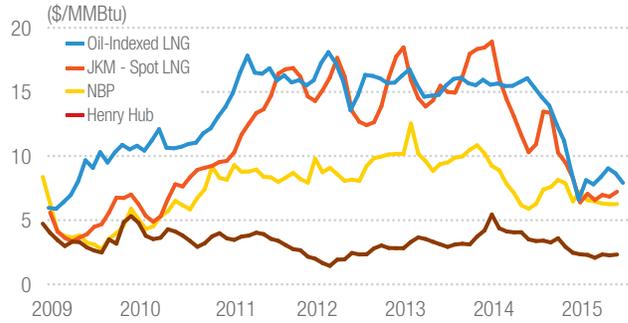
The impending rush of new LNG supplies and a diminished outlook on global demand suggest that we will once again see a decoupling of spot LNG prices from long-term oil-indexed prices, which will first reveal itself as weakness in the European market and will eventually bring global LNG prices in line with the US Henry Hub + transportation costs + margin. This new paradigm is likely to stand as long as the US has spare export capacity above global requirements.

A Bentek analysis, supported by Eclipse shipping data and price forecasts, suggests that in 2016 a US capacity holder (assuming 115% Henry Hub feedstock costs) may be able to send gas into the Asian spot market at a delivered price as low as \$4.74/MMBtu when the sunk cost tolling fee is ignored. The same capacity holder may be able to deliver into the European market for a minimum price of about \$3.90/MMBtu. If we assume that a seller would require a 10% margin on that trade, then a US capacity holder may require an Asian spot price of around \$5.50/MMBtu to send gas to Asia and a price of around \$4.30/MMBtu to send gas to Europe (See Figure 7). These key price supports are denoted in Figure 7 as the Asian Required Price and the European Required Price.

Eclipse expects that the NBP will fall to under \$5.30/MMBtu next September. However, if global demand flags (due to a warm winter 15-16 in Asia, for instance) prices could dip further, pressuring the European required price. Should the NBP fall below the European required price, US capacity holders would likely shut in exports. Similarly, during the winter 16-17, if demand is high in the US or if US production wains, Henry Hub cash prices will strengthen and a US capacity holder will require a higher international price to exercise their liquefaction rights.

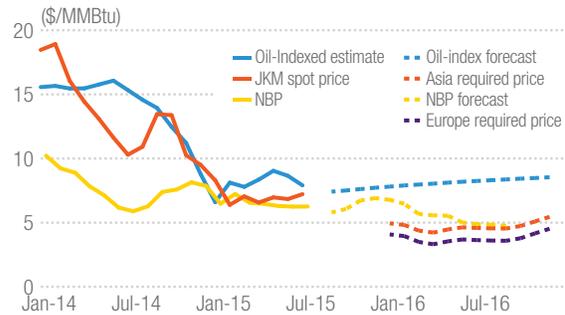
Because Northeast Asia and European winters align with North American winter and all three regions share a similar demand profile, strengthening of US gas prices would likely be followed by an increase in global spot LNG prices as well.

FIGURE 6: GLOBAL GAS PRICES



Source: Platts

FIGURE 7: GLOBAL LNG PRICE EVOLUTION



Source: Platts, Bentek Energy, Eclipse Energy Group

The risk of underutilization becomes more apparent during the summer and shoulder months, when global demand and prices are traditionally at their lowest. Furthermore, this risk is more apparent for portfolio marketers as opposed to the utility capacity holders, which are more likely to have firm downstream demand requirements.

Therefore, European (NBP) and Asian (JKM) spot gas prices, and the supply and demand dynamics that drive price in those regions, will largely determine the dispatch of flexible US LNG exports. Similarly, US supply and demand dynamics, which will affect feed gas sourcing costs at Henry Hub, will dictate at which price levels US LNG is likely to be called upon. Therefore, close attention needs to be paid not only to the US supply and demand fundamentals, but also supply and demand fundamentals across Europe and Asia, which will affect prices and ultimately drive US export demand.

Despite hopes that global demand will arrive as the savior of US gas markets starting in 2016, it appears that the US LNG exporters may be entering the market just as the party seems to be dying down. That is not to say that global demand won't once again respond to low prices, incentivizing new demand development, but demand creation is slow-moving and may take until the next decade to truly take shape. Until then, it's more likely that the world will be awash in cheap LNG, US capacity holders will compete for the marginal buyer, and exports will generate additional seasonal demand swings in the US as capacity holders play spreads in the global gas markets.

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