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Exuberance ebbs away as supply crunch fears grow

Analysis - *World gas: LNG 2008-05*

The growing prospect of shortages in LNG supply after 2010 could start to destroy demand, as potential buyers consider alternative fuels. Alex Forbes reports from the Gastech conference in Bangkok

Construction work in progress on one of Qatargas 2's 7.8m t/y megatrains

GAS buyers are losing confidence in the liquefied natural gas (LNG) industry's ability to meet demand over the long term. As a result, they are increasingly likely to switch to other fuels, leaving the LNG industry facing a crisis of credibility.

Since the LNG 15 conference in Barcelona a year ago, there have been just three final investment decisions (FID) for gas-liquefaction projects: Pluto LNG in Australia (4.8m tonnes a year – t/y); the Skikda rebuild in Algeria (4.5m t/y); and Angola LNG (5.2m t/y) (see Table 1). In the preceding 16 months, between the end-2005 sanction of Qatargas 4 and LNG 15, in April 2007, only one new project was approved: the 4.45m t/y Peru LNG plant.

Just 19m t/y of LNG capacity has been sanctioned in the past two-and-a-half years. In addition, it is unlikely that many planned projects will achieve FID before the end of this year.

Potential new capacity

Nigeria LNG train 7 – which at 8.5m t/y would be the world's largest LNG train – is a possible contender, but approval in 2008 is far from certain. There have been reports that Iran may soon embark on construction of an LNG project, but the nation's recent record for successful initiation of new oil and gas projects has been very poor.

Gorgon LNG in Australia now looks as though it may not be sanctioned until the year after next. Algeria's Gassi Touil project is another possible, but again far from certain, given its recent history.

The LNG industry's subdued mood was evident at the recent Gastech conference in Thailand – a contrast with expectations at the start of 2006, when the industry was on a high following Qatargas 4's FID in December 2005. Then, there were hopes that numerous new and expansion projects would be sanctioned in 2006 and 2007. According to one estimate at the start of 2007, it was expected that 14 projects in seven countries would receive FID over the course of the year, representing total capacity of perhaps 70m t/y.

It takes around four years from FID for a gas-liquefaction project to become operational. So it is no surprise that people are starting to wonder where incremental LNG supply will come from after 2010 to meet projected demand growth. Post-2012, the picture looks very bleak for at least a couple of years.

There is little question that in a world of unconstrained supply, LNG demand would continue to rise rapidly over the coming decade or so – for several reasons:

- Despite the crisis in financial markets, economic growth rates around the world are projected to remain relatively high, with a consequent increase in demand for energy, despite falling energy intensity in many markets;
- In an increasingly carbon-constrained world – as global warming concerns translate into policy – gas has significant advantages over more carbon-intensive fuels, such as oil and coal, in non-transport applications such as power generation. As carbon pricing develops and spreads, this will translate into economic as well as an environmental advantages; and
- As distances between gas reserves and markets increase, LNG will become increasingly competitive with pipeline supplies. At the Gastech conference, Jon Chadwick, executive vice-president in Asia for Shell Gas & Power, said: "Offshore, LNG beats pipeline gas over distances longer than 1,500 km. In straightforward onshore terrain, LNG competes favourably with pipeline gas over distances greater than 1,800 km. Beyond 4,000 km, whatever the terrain, LNG is the better-cost choice." On some trade routes, such as Middle East to North America or Japan, it is the only feasible option.

Table 1: Final investment decisions on LNG projects, 2006-08

Project	Shareholders	Capacity (million t/y)	FID date	EPC contractor	EPC value ($bn)	Specific capital cost ($/t/y)	Start-up	Notes
Peru LNG	Hunt Oil (50%, operator), SK (20%), Repsol YPF (20%), Marubeni (10%)	4.45	Dec 2006	Chicago Bridge & Iron	1.5	337	H1 2010	Total project cost, including financing, $3.8bn
Pluto LNG	Woodside (90%, operator), Tokyo Gas (5%), Kansai Electric (5%)	4.80	Jul 2007	Foster Wheeler and WorleyParsons	10.0*	2,080*	Q1 2011	Cost for onshore plant estimated at $1,200-1,400/t/y
Skikda re-build	Sonatrach	4.50	Jul 2007#	KBR	2.8	622	2011	—
Angola LNG	Sonangol (22.8%), Chevron (36.4%), Eni (13.6%), Total (13.6%), BP (13.6%)	5.20	Dec 2007	Bechtel	Not disclosed	-	Q1 2012	—

#Date EPC contract award was announced. *Includes investment for upstream production

These factors have led in recent years to forecasts for LNG growth to 2020 ranging from 7% a year to 13%/y – with the International Energy Agency and Cedigaz at the lower end of the spectrum and the oil and gas majors at the upper end. Such bullish numbers are, to some extent, supported by historical trends and expected near-term growth.

Over the past two decades, LNG trade has been growing by around 8% a year. Between 2005 and 2006, the industry grew by 11.6%, and between 2006 and 2007 by 9%. According to Chadwick: "LNG demand is growing at around 8-10% a year – four times the global annual growth rate for gas overall." This estimate is based on the projects under construction that are due to start up during the period between now and 2010. But the past is not necessarily a good guide to the future because of a fundamental shift that has taken place in the LNG industry in recent years.

The question of how LNG supply is likely to grow after 2010 – given foreseeable supply constraints – was addressed at Gastech in a presentation by Andy Flower, of Flower LNG, a consultancy. "The international LNG business has seen many changes in its 43-year history. One of the most dramatic is the change to a sellers' market over the last three years or so," he said. "It's the first time that we've been in a true sellers' market."

In other words, despite recent rapid growth in production capacity (see Figure 1) – particularly in Qatar, now the world's largest producer – demand has been growing even faster.

Last year, according to Flower, most oil and gas companies and consultants were forecasting growth rates over the next 10 years of 8-13%/y. However, he questions whether annual growth rates of 8-9%, seen for the last 20-25 years, can be maintained. In 2013 and 2014, for example, more capacity would need to be commissioned than is expected in 2009, when three of the Qatari mega-trains are due to come on stream. "I just don't see that as feasible – especially taking into account that that phase of development, given the Qatari moratorium

(on further development of the North Field), will have to come from countries other than Qatar." Forecasts of 13% are "just fanciful", he added.

A more likely outcome, says Flower, is that growth rates in LNG supply will be about half today's rate. Growth of 4-5%/y beyond 2013 would still require the commissioning of three new trains every year, but is a more realistic target, he says. "The seller's market is here to stay for the next decade at least," he adds.

So what are the factors that have led to so many proposed liquefaction projects being postponed or cancelled? Flower identified three: construction costs, availability of gas supplies and geopolitics.

The elusive plateau

According to Cambridge Energy Research Associates (Cera), which publishes indices of oil and gas construction costs, the investment required for upstream projects has almost doubled since 2005 (see Figure 2). Its latest figures, published in November 2007, showed costs in third-quarter 2007 were 98% higher than in 2000, with almost all the increase having taken place since 2005.

"Construction costs began their dramatic rise in 2005, driven by a sudden, sustained increase in the price of steel in 2003, followed by the upward swing in oil prices that began in 2004," says Cera. "As industry activity levels increased in 2005 and 2006, manufacturers and suppliers of oil and gas equipment and services reached capacity and began to increase their prices. The cumulative effect of tight capacity caused by high activity levels and high raw material costs is a near doubling in two years – 106 points in 2005 to 198 points in 2007 – in capital required to build the same volume of facilities."

Looking ahead, says Pritesh Patel, a researcher at Cera: "In the first half of 2007, the rate of cost increases moderated slightly when compared with the increases of the previous year. This raised an expectation in the industry that cost increases may be coming to an end. The latest data indicate this not to be the case."

At last month's Oil Summit in Paris, Petroleum Economist asked three senior industry figures which way costs are likely to move. Total's chief executive, Christophe de Margerie, Shell's head of exploration and production, Malcolm Brinded, and Thierry Pilenko, head of engineering, procurement and construction contractor Technip, all said they expected costs to continue rising rather than to reach a plateau in the near future.

Pilenko, whose company is working with Chiyoda on the six LNG mega-trains in Qatar, said a cost index compiled by Technip for all the projects it is involved with shows that between 2003 and 2007, the cost of engineering rose by 8% a year, procurement by 24% a year and construction by 12% a year. "We certainly don't see a plateau," he said. "We see continuous increase."

According to Flower, the costs of LNG projects that have reached FID in the last two years fall in a wide range of $600-1,400 per t/y of capacity (see Figure 3). This is three to five times the level of three to four years previously.

A bigger problem for many LNG developers than cost inflation, said Flower, will be securing sufficient gas supply to make projects viable: "Governments are increasingly questioning whether exporting gas as LNG, or indeed by pipeline, is the best solution for their country, or whether the reserves should be kept for domestic use. Even in Qatar, which will have 100 years of reserves even when it reaches 77m t/y (of LNG capacity), the argument is that these are the resources for future generations and that they have to be husbanded sensibly."

Trouble ahead?

There are times when the announcement of good news also serves as a reminder that there may be trouble ahead. The FID for Angola LNG in December – the last LNG FID to be announced – was a case in point.

The long-delayed sanctioning of Angola LNG was excellent news for one of the world's poorest nations, not just because of the revenue the project will bring in from exports to the US, but also because it will create a gas market within Angola and reduce gas flaring. It was also good news for the project's other sponsors, most of which have waited many a year to see it come to fruition. The twist was the hammering home of the realisation that FID for a gas-liquefaction project has become big news – because there have been so few of them in recent years.

At LNG 15, Mohamed Hassan Marican, chief executive of Malaysia's Petronas, warned delegates that if the global LNG industry appeared in any way to be unable to provide the comfort of supply, it would face a "credibility and reputational problem". The industry, he said, "will face the prospect of buyers turning to alternative sources". At present, that outcome appears more than likely.