LNG: The ‘Great Race’

Which projects will reach the finish line?

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Growth of the LNG industry continues in 2005 as a global LNG infrastructure begins to emerge. At the end of 2004, global liquefaction capacity was approximately 150MTPA, and included 18 plants in 13 countries. At the same time, 14 countries were importers of LNG. By 2010, the number of players in the LNG market is expected to rise to over 35 countries. The entrance of these new market participants will be accompanied by significant shifts in global LNG trade flows as production in some existing LNG-exporting regions' declines or is superceded by projects under development in other regions where gas reserves are abundant and proposed liquefaction capacity is of a mammoth scale. In the short-term, this growth in LNG liquefaction capacity will be matched by the growing demand for natural gas imports (and therefore, LNG receiving capacity) in both developed and emerging economies, resulting from declines in domestic gas production and/or rapid industrial economic growth.

At present, LNG projects under construction or planning span six continents with the number of projects proposed in any one country ranging from one to over 40 projects. While many of these projects will come to fruition, countries with more proposed capacity than the market can bear, will see projects compete to be built. Moreover, some liquefaction projects with recurring delays that push their start-up dates beyond 2012 will be much less likely to capture market share and, by that time, can expect to face a less attractive price environment. The outlook for all proposed LNG projects is therefore not certain. Those projects on the margin will have to accelerate their schedule and/or demonstrate superior project economics if they are to succeed.

Who supplies in 2010?

The most significant development in global LNG supply by the end of this decade will be the emergence of Russia, West Africa and the Middle East as major new LNG exporters. Collectively, projects in these regions are expected to add over 80MTPA to global LNG capacity.

With 1,660 Tcf of reserves, Russia is already the largest natural gas exporter in the world. A number of projects aimed at stepping up the monetisation of this vast resource are currently under development and include both new natural gas pipelines into Europe and Asia, as well as the country's first LNG facility, which is to be located on its Pacific coast. Shell is the primary developer of Sakhalin II, which will be a 9.6MTPA LNG facility that primarily targets the Asian market, but may also deliver to the US Sakhalin II is scheduled to be operational in 2008.

Other LNG projects in Russia that are currently in early development phases aim to transport LNG through Arctic waters to Atlantic markets, primarily the US These include the Tambey, Shtockman and Baltic LNG projects, with only the first currently planned for operation before 2010.

While North Africa has been exporting LNG for three decades from an LNG facility in Algeria, West Africa has just now become another major producer of LNG on the continent. The most significant addition to global LNG capacity from this region has been in Nigeria, where the Nigerian National Petroleum Corporation (NNPC) and Shell LNG Project, Nigeria LNG (NLNG), has become a significant producer to Europe and North America. Currently operating with three trains, Trains 4 and 5 of NLNG, which will bring total LNG capacity up to 17MTPA, are expected to become operational this year with Train 6 planned for 2007. In addition, NNPC plans joint ventures for two LNG projects that will bring an additional 20 MTPA of LNG capacity online in 2009. These are ChevronTexaco and the British Gas Olokola project and ChevronTexaco and the Conoco Phillips Brass LNG project. LNG from these projects will serve the American and European markets. Nigeria is currently the largest oil exporter in Africa, and has estimated natural gas reserves of 190 Tcf.

Also in West Africa, Marathon's EG LNG project in Equatorial Guinea is a 3.4MTPA, one-train LNG facility that will process domestic gas reserves for export primarily to the US existing Lake Charles terminal. The plant is expected to become operational by 2008. Further south in Angola, a consortium of IOCs are constructing a 5MTPA, one train LNG facility that is scheduled for completion in 2009 and will also target the US as well as European markets.

In the Middle East, Iran's National Iranian Oil Company (NIOC) is currently involved in the development of four LNG projects that could have a total capacity of 45MTPA. The most advanced project is NIOC LNG, which will have a capacity of 10.6MTPA and become operational by 2009. While this project is entirely funded by NIOC, other LNG projects in the country are being undertaken as joint ventures with NIOC always holding a 50 per cent stake. The 10MTPA South Pars and 14MTPA Persian LNG projects will target European and Asian markets while the 10MTPA Iran LNG project will deliver to India. All three projects are targeted to become operational in 2010.

By far, the country that will experience the greatest rise in ranks among LNG exporters in this decade is Qatar. Through expansions to existing facilities, Qatar is planning to add over 40MTPA of liquefaction capacity by 2010, thereby increasing its total LNG capacity to over 60MTPA, or 40 per cent of current global capacity. All of these projects will draw from Qatar's estimated 910 Tcf of natural gas reserves - the third largest in the world. Qatar Petroleum's Qatargas expansion projects include three phases. Qatargas II, a joint venture with ExxonMobil, reached financial close in December 2004. The project includes two trains of 7.8MTPA and will be the largest LNG facility ever built when it comes online in 2008. All LNG from this project will be delivered to the UK. Qatargas III is being developed with ConocoPhillips and is a one train, 7.8MTPA facility. The project plans to deliver LNG to the US and has a projected start-up date in 2008 or 2009. Qatargas IV, a Shell and Qatar Petroleum venture, is still in early stages of development but is currently designed to be a 5MTPA facility that will serve European and US markets. Qatar's other major LNG expansion is Qatar Petroleum and ExxonMobil's RasGas II project which is a five train expansion (one train was completed in 2004) that will include nearly 30MTPA of new LNG capacity to serve European, Asian and US markets.

LNG Demand: US vs Asia?

Between 2003 and 2010, global LNG demand is projected to double from 121MTPA to 249MTPA. The most important additions to the group of LNG-importing countries will be in Asia, which already represents two-thirds of global LNG demand - more than any other region. Growing energy needs in China and India, already the world's second and sixth largest energy consumers, are now set to include LNG imports. While initial imports to these two countries is forecast to constitute only around 10 per cent of the total for the region, the uncertainty underlying growth of LNG consumption in China and India and whether it will lead or lag economic growth suggests great variation in possible future scenarios of LNG demand in Asia.

India began importing LNG in 2004 when its first LNG facility, state-owned Petronet LNG's Dahej terminal, became operational with LNG supplied by train 3 from RasGas. The Dahej terminal is located on the country's western coast in the state of Gujarat, and has an initial capacity of 5MTPA. Plans to double the capacity of the Dahej terminal have already been proposed. In addition, India has two other proposed terminals – Shell's Hazira terminal and Petronet's 2.5MTPA Kochi terminals – that are to be completed by 2008.

China's plans to import LNG supplement current pipeline projects from Central Asia and Russia that are also designed to increase the country's access to natural gas. Companies investing in the country's first LNG terminals include the China National Offshore Oil Corporation (CNOOC), BP, and Fujian Enterprises. The 3MTPA Guangdong and 2.5MTPA Fujian LNG terminals are already under construction on the country's south eastern coast with respective operational dates of the end of 2005 and 2007. Both projects will receive Pacific Basin LNG: the Guangdong terminal from Australia and the Fujian terminal from Indonesia. Along the coast (further north), two other projects currently in planning stages, with projected start-up by 2009, are the Shanghai and Zhejiang LNG terminals.

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Despite consumption gains in Asia, in absolute terms, the largest increases in LNG demand will occur in the US. where LNG consumption by 2010 is forecast to quadruple, from around 12MTPA to 48MTPA. Less dramatic but important additions to LNG receiving capacity are also expected in Europe.

The US represented nine per cent of global LNG demand in 2003, a percentage that is projected to double by 2010. There are currently over 40 new LNG terminals proposed in the US, but only three of those have received approval from the US Federal Energy Regulatory Commission (FERC). These are Cheniere LNG's Freeport and Sabine Pass terminals and Sempra Energy's Hackberry terminal in the Gulf of Mexico; collectively, they comprise 42MTPA of terminal capacity. In addition to these new terminals, 12.6MTPA of capacity expansions at two of the country's four existing terminals (Elba Island and Lake Charles) have also been approved.

Less directly, a significant amount of LNG is expected to flow into the US via Mexico and the Bahamas. In Mexico, four LNG terminals have been proposed for development on the country's Pacific coast with three of those terminals planning to route all of their gas to the U.S. A portion of gas from the fourth terminal, along with all of the gas from a fifth proposed terminal on Mexico's Atlantic coast, will serve Mexico's own growing demand for natural gas, especially in the power sector. Stakeholders in one or more of these terminals include Shell, Sempra Energy, Total S.A, ChevronTexaco and Tractebel. In the Bahamas, three original proposals for LNG terminals have consolidated into two proposals, by AES Ocean Express and Calypso Tractebel, that are currently competing to supply approximately 0.7MTPA of regasified LNG through a pipeline to the state of Florida in the US Although the pipeline has received FERC approval, neither of the proposed terminals has yet received government approval in the Bahamas, although both projects are aiming to be operational in 2007.

Europe's share of global demand for LNG is expected to be roughly the same in 2010, although in absolute terms this still translates into a doubling of LNG import volumes. In Europe, the UK is developing two large LNG terminals as it prepares to become a net importer of natural gas in light of declining production at its North Sea gas fields. The South Hook and Dragon LNG terminals in Wales will provide the country with 11.4MTPA of LNG from Trinidad, Egypt and Qatar beginning in 2007. Other proposed terminals in Europe include an 8MTPA terminal in Italy that will begin to receive supply from Egypt's ELNG project in 2008; a second terminal in Fos-sur-mer, France, with a capacity of 6.2MTPA; and three new terminals in Spain that will boost that country's LNG capacity by approximately 10MTPA.

Which projects will reach the finish line?

Mitigating price risk has always been a fundamental task in structuring LNG projects, typically achieved through a long-term sale and purchase agreement (SPA). Going forward, the long-term SPA will continue to be a defining criteria for most LNG projects in order to anchor the massive investment requirements for an integrated LNG chain. However, in the current environment where LNG projects are competing to be built, mitigating price risk requires that project developers also focus on project economics, timing and integration along the value chain in order to be successful.

Superior project economics (through being a low cost producer) obviously increases a project's ability to compete against other producers and operate in flexible and lower price environments. In Qatar, very low feedstock cost has enabled its Qatargas and RasGas projects to prevail as the lowest cost producers of LNG. To compete with Qatar and similarly endowed countries in Africa, other LNG projects are achieving lower costs through the construction of larger trains that exhibit economies of scale. Lowering transportation costs, a significant component of the cost of delivered LNG, through the construction of larger LNG ships is another strategy. Finally, choosing to expand an existing LNG facility rather than building a greenfield project, as is the case for the majority of current LNG projects, can produce significant advantages in the form of reduced facilities costs.

Various developments in the LNG market have contributed to the more challenging price environment facing LNG producers. This includes the increasing flexibility of many long-term SPAs, which allows LNG buyers to sell LNG shipments to third parties and gives them the option to take or not take shipments. In addition, over the last decade the market has witnessed a rise in spot cargoes and short-term sales of LNG. While still a small portion of total sales, short-term sales of LNG have increased from less than one per cent in 1991 to eight per cent in 2002.

In the US, the destination market for an overwhelming number of LNG projects, price volatility in recent years and a finite ability to absorb new LNG capacity at prevailing natural gas prices, suggests that only LNG projects with the most competitive economics will succeed in serving the US market. While this is true, a delay in the timeline of an otherwise competitive project could lead it to lose its opportunity to secure a share of the US LNG market. Currently, projects targeting to be operational between 2008 to 2012 have the best potential for market penetration and optimal pricing. Beyond 2012, the forward price curve for Henry Hub declines to a level that would be uneconomic for most greenfield LNG projects.

Another potential barrier to the US LNG market, and to an LNG project's success, is the ability to secure terminal capacity in the US market. One solution is to include the construction of an LNG terminal in the US as part of the LNG project, thereby creating an ownership-integrated project. This was the strategy employed by the Qatargas II project, wherein the project's sponsors are stakeholders in the construction of the LNG terminal in the UK that will be served by the project's Qatari liquefaction facility. However, the more common method of securing terminal capacity for a project has been to contract capacity at a separately-owned LNG terminal. Marathon's EG LNG project is an example of this type of contractually-integrated project, having secured capacity at the American Lake Charles Terminal to deliver LNG from Equatorial Guinea. A similar problem exists for proposed LNG terminals in the US. Without securing a long-term contract for LNG deliveries, a proposed terminal will be perceived as too risky to obtain adequate financing.

Who is funding this race?

It is estimated that over US$50 billion of new investment in LNG projects will be required by 2010 to finance LNG liquefaction, shipping and receiving facilities. The surplus of capital currently available in bank markets will be the largest source of debt financing for most of these facilities. However, given the magnitude of capital required for some liquefaction projects as well as the location of some projects in countries with significant sovereign risk, the export credit agencies (ECAs) will play an important role in providing both capacity and necessary political risk coverage. The capital markets will be an option for only a handful of projects. In addition, the smaller capital investment required for receiving terminals means some terminal projects are likely to be financed off of sponsors' balance sheets. For ownership-integrated projects, individual components of the project will be financed separately, as in Qatargas II. At a minimum, this avoids the complications that would arise from a single financing when each component resides in a different legal jurisdiction.

Conclusion

The global abundance of LNG projects presents a large number of investment opportunities, although the reality is that not all of these projects will be built. Understanding the nuances of price risk in the LNG market is key to understanding the prospects for new LNG infrastructure. While project economics are important, the timeline of some LNG projects may be the ultimate determinant of their success. **iJ**

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