

An **E3 Consulting®** White Paper



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Liquefied Natural Gas

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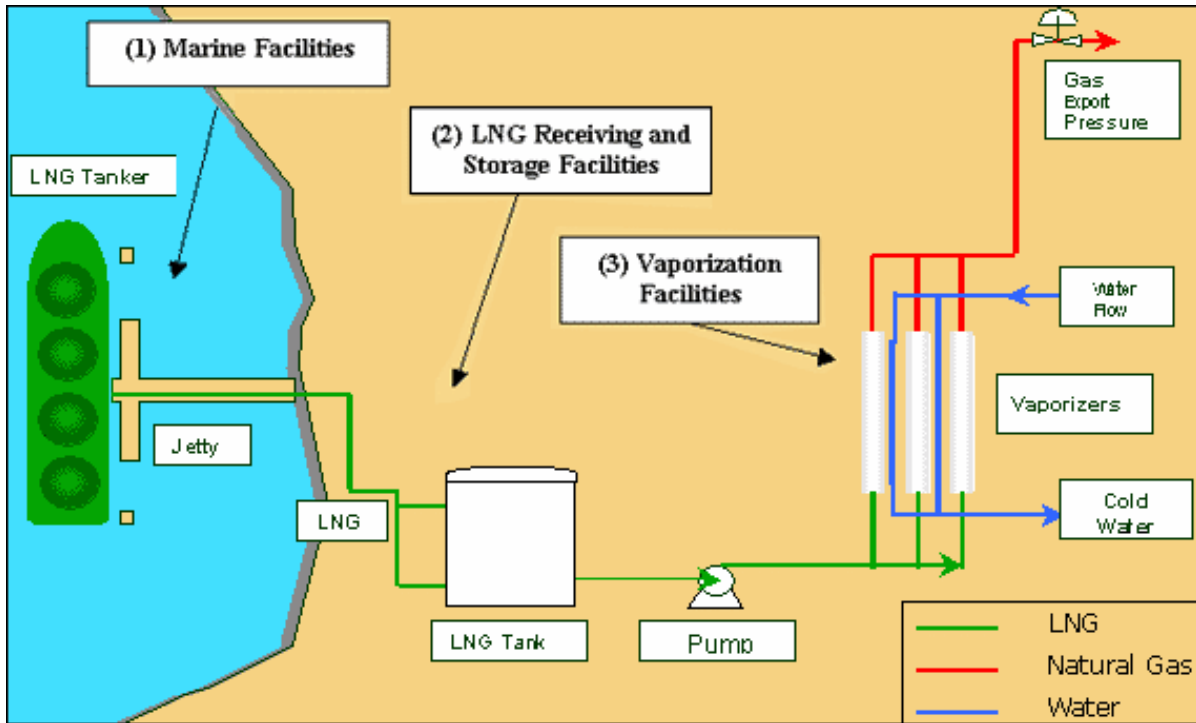
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A hot topic among the energy and lending communities involves a cool subject—liquefied natural gas (“LNG”). In the face of sustained, high natural gas prices and a rapidly maturing North American natural gas reserves base, LNG has been looked upon by many as a viable means of bridging the widening gap between domestic supply and demand.

LNG Terminals

LNG terminals include large storage tanks, vaporization equipment, jetty facilities to berth and unload LNG tankers, and associated heat exchangers, condensers, compressors and pumps (see figure below). Because the design aspects of LNG terminals are relatively simple, independent advisory firms such as E3 Consulting® must add value not only through a review of the technical aspects of the project, but also through a comprehensive review of the environmental, commercial, regulatory and financial aspects of these particular projects. Although E3’s comprehensive approach is common to all of our projects, our approach is particularly important in assessing projects such as LNG terminals, gas storage facilities and pipelines. In our view, the interrelationship between each of these components of the United States’ natural gas system will have a direct impact on the eventual success of individual projects within the system, as we will discuss in this paper.



Sabine Pass Financing

In early 2005, HSBC and Societe Generale closed a highly successful \$822 million project financing of the Sabine Pass LNG facility, the first U.S.-Based LNG receiving terminal financing in many years. Is the Sabine Pass financing a precursor to many similar LNG terminal financings yet to come, or is Sabine Pass an anomaly in the world of project finance? In true consulting form, our answer is a definitive “yes”. In other words, although the project finance market is likely to see additional LNG financing opportunities, those opportunities may ultimately look significantly different from Sabine Pass.

LNG Project Inventory

There are presently five operational LNG terminals in North America, including the recently constructed Gulf Gateway Energy Bridge located in the Gulf of Mexico. These five terminals have a maximum daily deliverability of approximately 4.2 BCFPD. The Federal Energy Regulatory Commission's ("FERC's") Office of Energy Projects reports that as of April 14, 2005, there are a total of 55 additional LNG terminal projects proposed in North America. Of these 55 projects, eight have been approved by FERC, two have been approved by the US Coast Guard and two have been approved by Mexican authorities. These projects represent over 58 billion cubic feet per day ("BCFPD") of natural gas deliverability. In comparison, the United States used an average of 61.4 BCFPD in 2004 and had a peak gas usage of 86.4 BCFPD in January 2004.

There has been well-documented environmental opposition to the development of LNG terminals on both coasts of the United States, as well as the western coast of Mexico. This opposition may limit LNG terminal development on the east coast to expansions of existing terminals at Everett, Massachusetts; Cove Point, Maryland and Elba Island, GA, as well as potential LNG terminal developments in the Bahamas and the eastern provinces of Canada. There are no existing LNG terminals on the west coast of the United States, Canada or Mexico. Of the 55 potential LNG terminal projects mentioned above, 19 are on the east coast of the United States, in the Bahamas or eastern Canada. An additional 14 potential projects are on the west coast of Canada, the United States and Mexico.

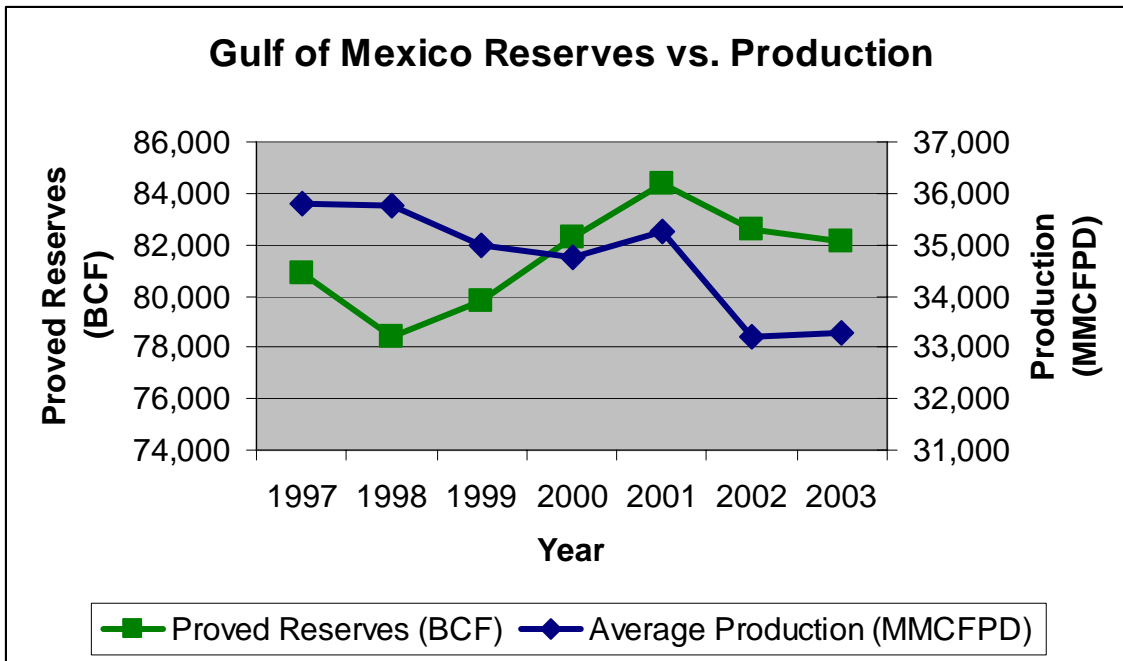
In our view, environmental opposition to LNG terminal development is strong enough along both the United States east and west coast that near-term project finance opportunities are likely to be limited in those areas. This leaves us with approximately 22 projects in the Gulf of Mexico, representing over 30 BCFPD of deliverability. In contrast to the eastern and western coastal states, the Gulf States have generally been receptive to LNG terminal development. The question now becomes, how many LNG terminals will the market support in the Gulf of Mexico?

Gulf of Mexico Supply-Demand Balance

If we look at new Gulf Coast LNG facilities as acting as replacements for declining domestic Gulf Coast gas supply, a key "pinch point" for LNG terminals becomes the amount of take-away natural gas pipeline capacity vs. Gulf Coast gas production and overall gas demand. In order to develop a rough Gulf Coast gas supply-demand material balance, we have reviewed historical natural gas production, reserves and pipeline takeaway capacity data from the region, as provided by the United States Energy Information Administration ("EIA"), going back to 1997.

RESERVES AND PRODUCTION

The following table shows Gulf of Mexico proved reserves and production since 1997. Although Gulf of Mexico production has decreased by an average of approximately 1.5 percent per year, proved reserves have generally increased or held steady over that time span. As a result, the proved reserves life, equal to proved reserves divided by current production, has increased from 6.2 years to 6.8 years. Even though this is an encouraging reserves trend, we will conservatively assume that Gulf of Mexico production continues its 1.5 percent per year decline for the purposes of establishing a future Gulf of Mexico natural gas balance.



PIPELINE CAPACITY

The EIA estimates that Gulf of Mexico net export pipeline capacity is approximately 36 BCF per day and represents slightly over 20 percent of total United States pipeline capacity. Over the past several years, pipeline capacity additions in the Gulf of Mexico region have been on the order of 2 to 3 BCFPD per year, as additional gathering, processing and storage infrastructure is built in the region. Little of this incremental pipeline capacity has been long-distance export capacity from the Gulf of Mexico, with the exception of the 1.1 BCFPD Gulfstream Pipeline project between Alabama/Mississippi and Florida. In the long term, our notional Gulf Coast supply-demand balance will assume that this trend continues, and minimal long-distance Gulf Coast export pipeline capacity is built.

INCREMENTAL GULF COAST LNG CAPACITY

Based on historical Gulf of Mexico export volumes and current Gulf of Mexico production levels, it appears there is sufficient room in the market for roughly 3 BCF of capacity at the present time, of which the Lake Charles expansion (1.1 BCFPD) and the above-mentioned Cheniere Sabine Pass project (2.6 BCFPD) have consumed.

If we assume that Gulf of Mexico gas production continues to decline by 1.5 percent per year, and that United States gas demand grows at 1.0 percent per year as projected by the EIA, the resulting Gulf Coast supply-demand balance allows for roughly 0.75 BCFPD per year of incremental LNG capacity through 2015, with roughly 0.66 BCFPD per year of incremental LNG capacity available through 2025. As a result, it appears that the market will allow for approximately 14 BCFPD of incremental LNG capacity to be built in the Gulf Coast of the United States over the next 20 years, excluding Lake Charles and Sabine Pass. This is less than one half of the announced 30 BCFPD of Gulf Coast LNG capacity presently being developed. Although LNG project development and construction typically span several years, there is still an inherent disconnect between the apparent need for 14 BCFPD of Gulf Coast LNG capacity over a 20-year period and the 30 BCFPD being developed today, all with similar in-service dates in mind.

Should new, long-distance Gulf Coast export pipelines or significant long-distance upgrades of existing export pipeline systems be built, Gulf Coast LNG requirements would likely grow accordingly. Such large pipeline project development would require, above all else, a change in public acceptance for energy infrastructure project development. Further, such a change in public opinion would likely also increase acceptance for coastal LNG terminal development, thus reducing the need for massive long-haul pipeline infrastructure projects from the Gulf Coast for LNG. As to when such a change in public perception might occur is anyone's guess; however, there are no present indications that such change is imminent.

Future LNG Financings

One important factor in the number of future LNG project financings is regional underground gas storage. Just as there is an ongoing LNG terminal development boom, there is a corresponding boom in the development of underground Gulf Coast salt cavern and reservoir storage. There is presently over 230 BCF of salt cavern and reservoir gas storage capacity being developed in the region at over 20 different project sites. As with any development project population (including LNG terminal development projects) many of these projects will not end up being constructed due to market, technical and environmental reasons. Those gas storage projects that are constructed should help to enhance the development of LNG terminals, by providing supplemental underground storage capacity and deliverability for offshore LNG shipments. In addition, the construction of LNG terminals should help to enhance the viability of regional underground storage, by providing a new customer base for underground gas storage projects.

Another important factor in the number of LNG project financings is the impact of the major oil and gas companies. Several of the Gulf Coast LNG terminals that have been announced are being developed by companies such as ConocoPhillips, Chevron, Shell, ExxonMobil, and BP. We expect that these projects will be financed on balance sheet, and they likely going to be constructed for company use, as opposed to being open access facilities. Therefore, significant portions of the available Gulf Coast export pipeline capacity may be consumed by these projects, somewhat limiting the potential for LNG project finance.

Getting back to the Sabine Pass LNG Project financing, Cheniere Energy was far ahead of the rest of the industry, as they commenced development of their project during a time of depressed natural gas prices. This foresight allowed Cheniere to secure 20-year commitments from Total S.A. and Chevron (Moody's – AA) for 1.7 BCFPD of the project's total peak capacity of 2.6 BCFPD.

Future LNG terminal deals may not be so straightforward. We anticipate that future LNG Terminal project finance deals will involve shorter contract terms, lower levels of uncontracted capacity and customers with lower credit ratings, analogous to the present market for gas storage projects.

In our view, LNG terminal development and financing is likely to follow the path of independent power development. The initial projects were highly successful and involved long-term power purchase agreements with well-established, creditworthy counterparties. These successful projects resulted in a tolerance for higher risk, until merchant energy became commonplace in the industry. We expect to see a similar progression in LNG terminal financing.

Will too many LNG terminals eventually be built, and will we ever see a fully merchant LNG terminal in the United States? In our view, given the long-term natural gas supply and demand situation in the United States, both of these outcomes are certainly possible, if not likely. Highly successful LNG terminals will be built, which will encourage additional development until, at some point, an overbuild situation is realized. Our job at E3 Consulting® will be to help our clients identify which projects will be the long-term winners in the game.