

# LNG: the fight for capital and markets

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Future LNG export projects will compete for debt financing as well as for access to re-gasification capacity in North America and Europe. North America, the larger of the two gas markets, is experiencing a surge in planned re-gasification projects.

Though justified by increases in North America-bound LNG production volume, these projects face interesting competitive issues including geographic advantage, alignment with LNG export project sponsors, and cost structure. In addition to these competitive factors, North American re-gasification projects face uncertainties regarding the impact that they, as well as other possible gas import projects (such as the Mackenzie Delta or Alaskan gas pipelines) will have on US natural gas prices. This additional capacity is likely to at least temporarily suppress gas prices. Excess re-gasification capacity, however, could suppress gas prices below the breakeven point of certain participants, as happened in the original wave of US re-gasification development following the 1983 fall in gas prices.

## US proving attractive

According to the US Energy Information Administration (EIA), US domestic gas demand is projected to increase at an annual rate of 1.8%, while US domestic gas production is projected to increase at 1.3%. Canadian imports are projected to remain steady at 15% of US

demand, with LNG imports making up the difference. This led Alan Greenspan, in June to refer to LNG imports as a “crucial safety valve” in maintaining US natural gas price stability.

The EIA predicts 2.14 tcf of imported

LNG, assuming gradually rising gas prices over the next 22 years if measured in today's dollars. However the projected 2025 gas price would be about \$7 in 2025 dollars. The EIA's High Economic Growth Case assumes gas prices which lead to a projected LNG import volume of 2.84 tcf for 2025. Both cases assumed development of a Baja re-gasification terminal, which is reflected in the 300 bcf of Mexican imported gas appearing in the EIA calculations.

Assuming conservatively that combined processing capacity of the existing four US re-gasification facilities is increased from the current level of 1.16 tcf to 1.47 tcf, the EIA forecasts would accommodate the addition of between 0.67 tcf to 1.37 tcf of re-gasification capacity. These volumes translate to the addition of approximately three to five additional LNG receiving projects, based on the average capacity of the 23 projects currently under serious consideration. The average planned re-gasification

## Projected US Natural Gas Supply and Demand

	2001 (tcf)	% of demand	2025 (tcf)	% of demand	Annual Increase
Total US Consumption	22.7		34.9		1.8%
Lower 48 Production	19.0		23.8	68.2%	1.3%
Alaska Pipeline (2021)	0		2.6	7.4%	
Total US Production	19.0	83.7%	26.4	75.6%	
Net Imports Required	3.7	16.3%	8.5	22.9%	
Net Canadian Imports*	3.4	15.0%	5.2	15.2%	
Net LNG Imports	0.7	3.1%	2.1	6.0%	11%
Net Mexican Imports	-0.3		0.3	1.0%	
<b>Total Imports</b>	<b>3.7</b>		<b>8.5</b>		

\*assumes completion of MacKenzie Delta pipeline in 2016.

Source: EIA.

## EIA Natural Gas Price Forecast

	2010	2015	2020	2025
EIA Reference Case (2003 \$/tcf)	3.29	3.55	3.69	3.90
EIA High Economic Growth (2003 \$/tcf)	3.59	3.71	3.63	4.50

Source: EIA

## Average Size of Planned Re-Gasification Projects

Region	Number of Planned Re-Gasification Projects	Average Processing Capacity (tcf/y)
East Coast	5	0.223
Gulf Coast	9	0.300
West Coast	9	0.297
Total	23	0.282

Source: EIA

plant size, however varies considerably between regions.

Factors including actual gas demand and re-gasification plant expansion progress could lead to a requirement of more than three to five new re-gasification projects. Inevitably, however, fewer than the planned 23 re-gasification projects will eventually be required.

### Intense competition

Factors increasing the competing re-gasification projects' access to finance and likely success include:

- **Proximity to gas consumers** – Projects planned in Louisiana and Texas, such as the four under development by Cheniere Energy, will benefit from access to the US's heaviest concentration of pipeline infrastructure and gas consumers. The Texas/Louisiana area has the leading gas consumption of coastal locations in the US, at 15.1 bcf/y, followed by California (6.7 bcf/y), New York (3.2 bcf/y) and Florida (1.5 bcf/y). Despite its strong gas consumption patterns, California offers relatively limited interstate gas transportation scope, and lacks the pipeline capacity to accommodate all five of the California-targeted re-gasification projects. Florida is projecting a 2 bcf/d gas demand increase by 2010, and is therefore unable to accommodate all of the four projects, totaling 2.7 bcf/d in capacity, aimed at Florida. These include three Bahamas-based re-

gasification projects with underwater pipelines to Florida.

- **Cost competitiveness** – re-gasification cost per thousand cubic feet is between \$0.16 to \$0.35 for expanded capacity at the four existing facilities, compared with \$0.45 to \$0.87 for new facilities. To determine a re-gasification terminal's cost competitiveness one must view its re-gasification cost (including marine costs), its throughput capacity and any geographic gas price premium. This then generates an all-in trigger price (i.e. – the price at which a re-gasification project's nearest city gate gas price must be in order for the project to be economical). The trigger prices for expansions of existing re-gasification projects range from \$3.31 to \$3.51 suggesting that the existing facilities' economy of scale advantages offset the impact of generally declining re-gasification costs.

### Re-Gasification Trigger Prices by Region

Region	Trigger Price (US\$ per thousand cubic feet)
New England	4.12
Middle Atlantic	3.93
South Atlantic	3.79
Florida	4.06
East South Central	3.81
West South Central	3.84
Washington / Oregon	4.64
California	4.37
Baja California / Mexico	3.40

Source: EIA

- **Alignment with LNG export sponsors** – developers of planned re-gasification projects that are also LNG export project sponsors include: ChevronTexaco, BP, Marathon, ConocoPhillips and Shell. All existing re-gasification projects have LNG export project sponsors as owners or capacity holders and this relationship enhances a re-gasification project's ability to sustain processing volume.

### Competing LNG export projects

LNG export projects potentially reaching a final investment decision within the next three years are located in Algeria, Angola, Australia, Egypt, Equatorial Guinea, Indonesia, Qatar, Nigeria, Norway, Trinidad & Tobago and Venezuela. Many will export to North America, based in part on an anticipated increase in re-gasification capacity.

In Qatar, Qatar Petroleum Corporation is sponsoring QatarGas 2 with ExxonMobil and QatarGas 3 with ConocoPhillips. QatarGas 2 targets the UK market and entails two 7.7 mtp/y trains and is expected to start producing 2006/7. QatarGas 3, expected to begin producing 7.5 mtp/y in 2008, is aimed at the North American market.

ConocoPhillips' Brass LNG Project, in Nigeria (with NNPC and ENI), is also reportedly a North American-focused project, and is expected to begin producing 5 mtp/y of LNG in 2007-8. Elsewhere in Nigeria, Nigeria LNG (NNPC, Shell, Total, ENI) has signed an MOU to supply BG with 2.5 mtp/y of LNG to the US from its NLNG Plus project (trains 4 and 5) from 2005/2006.

Elsewhere in Africa, Marathon Oil and GEPetrol signed an MOU with BG in May 2003 to supply 3.4 mtp/y of LNG from their Equatorial Guinean project for 17 years. The LNG is reported to be for BG's Lake Charles, Louisiana terminal. The Angola LNG project (Sonangol, ChevronTexaco, ExxonMobil, Total, BP) is likely to be a 4

mtp/y single train LNG plant, which could supply both the US and Europe.

As well as export projects ChevronTexaco is also developing several additional re-gasification projects (Port Pelican, Platform Grace, and Canaport). BP is developing re-gasification projects in Tampa and in Baja. Shell has also bid to develop the Altamira re-gasification project, Mexico.

The Atlantic LNG Project (NGC, BG, BP, Repsol) in Trinidad and Tobago received approval in June 2003 for Train 4 – a \$1.2 billion, 5.2 mtp/y addition, which is expected to be operational in early 2006. Trains 1 to 3 serve the US and Spanish markets, while Train 4 will be focused primarily on the US. Another US focused project is the Mariscal Sucre LNG Project in Venezuela. PDVSA, Shell, and Mitsubishi have launched a feasibility study for the \$2.7 billion project and could begin construction as early as 2005.

The Statoil led, \$6 billion Snøehvit Project, Norway, is expected to begin producing 4.2 mtp/y by the end of 2006. Statoil is a Cove Point capacity holder, and Snøehvit is expected to export to the US, France and Spain.

In Asia, Australia's Northwest Shelf Project (Woodside, BHP, BP, Chevron, Shell, Japan, Australia LNG) is developing a one-train expansion to supply both the Chinese and Japanese markets beginning in 2004. Other Australian projects include Gorgon LNG (Chevron, Shell, ExxonMobil), Northern Australia Gas Venture (Shell, Woodside, Methanex), Greater Sunrise/Troubador (ConocoPhillips, Woodside, Shell, Osaka Gas), and Bayu-Undan (ConocoPhillips, Santos, Inpex, Kerr-McGee and Agip). ConocoPhillips is developing a re-gasification project in Baja, presumably in anticipation of exports from its LNG projects in Australia's Timor Sea (Greater Sunrise/Troubador) and Bayu-Undan.

Also under development in Asia are the Tangguh LNG Project (Pertamina, BP, Mitsubishi), exporting gas to China, South Korea and potentially other Asian markets from 2007 and Badak Train 1 (Pertamina, Total, Unocal, VICO), and Donggi LNG (Pertamina). Also planned are Malaysia's Tiga LNG (Petronas, Shell, Mitsubishi, Sarawak) and Russia's Sakhalin LNG (Shell, Mitsubishi, Mitsui).

### Competition for financing

LNG re-gasification and LNG production/export projects offer lenders different market risk and political risk profiles, thereby reducing the direct competition between the two types of projects for debt funding.

With the notable exception of Snøehvit and QatarGas 2 and 3, the current crop of LNG export projects is heavily skewed towards emerging market locations, which typically leads to strong requirements for Export Credit Agency (ECA) and Multilateral Agency (MLA) involvement. The planned re-gasification projects would enjoy less perceived political risk than the average LNG export project, due to their location in the US or in Mexico, and therefore are most likely to attract simple commercial bank debt without ECA or MLA cover. Although the Mexican Altamira re-gasification project, intended to supply Comision Federal de Electricidad (CFE), entails currency transfer and convertibility risk, the other planned re-gasification projects involve US\$ sales.

The LNG export projects highlighted represent about \$40 billion in total future capital costs, with at least \$6 billion likely to be fully equity funded. Assuming the remaining \$34 billion is financed with 50% leverage, there will be a need for about \$17 billion in debt financing. If there is a normal distribution of equipment nationality, this amount could be

accommodated by a combination of ECA and MLA funding. Additionally, as observed in the \$1 billion Nigeria LNG Plus financing, local banks can contribute, depending on the project location. Another way that lending capacity would be spared would be through a separate financing of the ships.

The financing of re-gasification projects in the US is an untested process in recent years, but would most likely entail commercial bank loans, on a limited recourse basis. But what these projects "gain" in credit profile by virtue of their geography, they may lose by virtue of the substantial market risk element. If re-gasification terminals are not linked directly to an LNG production project, at least by contracted supply if not an integrated project, then the ability of many of the planned terminals to attract LNG supply and send out cost competitive gas is questionable.

For commercial banks to encounter any substantial "merchant" characteristics in the risk profile of a re-gasification facility, there is unlikely to be a positive reaction. "Merchant" and "energy" are still not welcome terms to most commercial bank credit committees. For reasons of market competitiveness and ability to attract capital, it is, therefore, probable that far fewer than the 23 announced re-gasification terminals are going to be realised over the next 4 to 6 years. In fact, the commercial bank market will serve as a vital "invisible hand", effectively regulating re-gasification market entry by denying funding to projects lacking a strong enough cost structure and marketing strategy to endure the gas price impact which that project's addition to the ever-fluid US gas supply equation would cause.

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