



IMPACT OF US LNG EXPORTS ON EUROPE

White Paper



Energy Mining Advisory Partnership

ABSTRACT

With Cheniere Energy's Sabine Pass LNG facility scheduled to start production in Q4 2015, the whitepaper examines the potential impact of US LNG exports on European natural gas prices and energy security.

Introduction

Three technological advancements led to the US shale gas boom in last ten years. Hydraulic fracking made extraction from low permeability shale formations economically viable, horizontal drilling increased the amount of shale that could be “fracked” from a single well and improvement in seismic imaging reduced the number of drilling attempts by providing more accurate information. This resulted in 50% increase in reserves and 34% increase in natural gas production in US over the last decade. The increased production reduced the price of natural gas in US to one-third of European levels and one-quarter of Japanese levels. This created a compelling commercial logic for exporting natural gas from US.

As a result, the Department of Energy (DoE) in US received 43 applications for permission to export liquefied natural gas (LNG) from a total of 34 proposed terminal projects till July, 2014. The table1 below shows the major LNG export terminals that are under construction in US.

Facility Location	Production in billion cubic meters per year	Scheduled opening
Corpus Christi, Texas	22.1	2018
Freeport, Texas	18.6	2018
Sabine, Louisiana	25.5	2015
Cameron, Louisiana	17.6	2018
Cove Point, Maryland	8.5	2017

Table1: Export facilities under construction in US.

Source: Stratfor.com

Current Situation

EUROPE

The EU imports 53% of its energy needs. In 2013, the EU imported 305 billion cubic metres (bcm) of natural gas – 66% of its consumption. Russia supplied 39% of EU gas imports by volume, Norway 33%, and North Africa (Algeria and Libya) 22%. Six EU Member States are dependent on Russia for their entire imports of natural gas. Conversely, Russia depends on the EU as a customer – 71% of Russian gas exports go to the European market.

Europe has gas pipelines connecting it with all the major suppliers having a total capacity of 530bcm/year. New pipelines are under construction to bring gas from Caspian region, Iraq and Iran to Europe via Italy and Turkey. Apart from pipelines, Europe also has 19 LNG terminals having a total capacity of 207 bcm per year and more are under construction.

Long-term gas contracts are indexed to oil price and include take-or-pay obligations which require the customer to pay for a certain amount of natural gas whether they take it or not. Take-or-pay obligations generally make a high percent of contracted volumes. When in 2009, the oil prices bounced back while spot prices of natural gas remained depressed, causing a huge gap between spot prices and oil-indexed prices in Europe, Europe negotiated with its suppliers, particularly Russia’s Gazprom, to amend the oil-indexed price formulas and reduce volumetric commitments. In May 2014, Eni and Gazprom announced that they had moved from oil-indexation to spot-price indexation for long-term contracts. Adverse ruling in the European Commission’s antitrust probe might weaken Gazprom further and lead to hub based pricing of most of natural gas contracts.

The prices at various LNG hubs in Europe are shown in the table2 below:

Hub location	Prices (US\$/mmbtu)
Spain	7.20
Belgium	6.92
U.K.	7.16
Central Europe	6.60

Table2: Average prices at LNG hubs in Europe for March, 2015

Source: Stratfor.com

Asia

The Asia-Pacific market is the largest LNG market and is expected to become the largest natural gas consuming region by 2035 according to International Energy Agency (IEA). Hence, any impact of US LNG exports on Europe cannot be fully understood without analysing its impact on Asian markets.

Asian markets are dominated by long-term oil-indexed LNG contracts. This has prevented creation of an efficient and competitive natural gas market in the region. In addition to usual take-or-pay clause, the contracts also specify the destination of LNG, making the market isolated and reducing the possibility of gas-on-gas competition. These factors have always kept the price for LNG imports the highest in the region and thus, it was the preferred destination for US LNG exports when the LNG terminals, discussed in table1, were first proposed.

Recent oil price decline has led to major downward revision in the LNG import prices in the region as most of the long-term contracts are oil-linked. The average prices at various LNG terminals in the region for March, 2015 are presented in table3 below:

Terminal Location	Price (US\$/mmbtu)
Korea	7.00
Japan	7.00
China	6.60
India	6.90

Table3: Average LNG import prices in Asia-Pacific for March, 2015.

Source: Stratfor.com

Turkey

Over the past three years, Turkey has experienced some of the fastest growth in energy demand of countries in the Organization for Economic Cooperation and Development (OECD) because of stronger economic expansion. The domestic production fulfils less than 10% of its energy demand and Turkey relies on imports for its energy needs. The energy mix has moved strongly towards natural gas and in 2012, it overtook oil in terms of volume consumed.

The country receives majority of its import through pipelines and aims to become a major transit hub because of its location between continental Europe and Caspian Region as well as the Middle East. It receives 85% gas from pipelines and 15% from LNG. The total capacity of LNG terminals is

14.2 Bcm/y; Marmara Eriglisi has a capacity of 8.2 Bcm/y and Egegas Aliaga has a capacity of 6 Bcm/y.

The country has long-term contracts in place for most of its imports. The price that Turkey pays to various countries under these contracts is listed below:

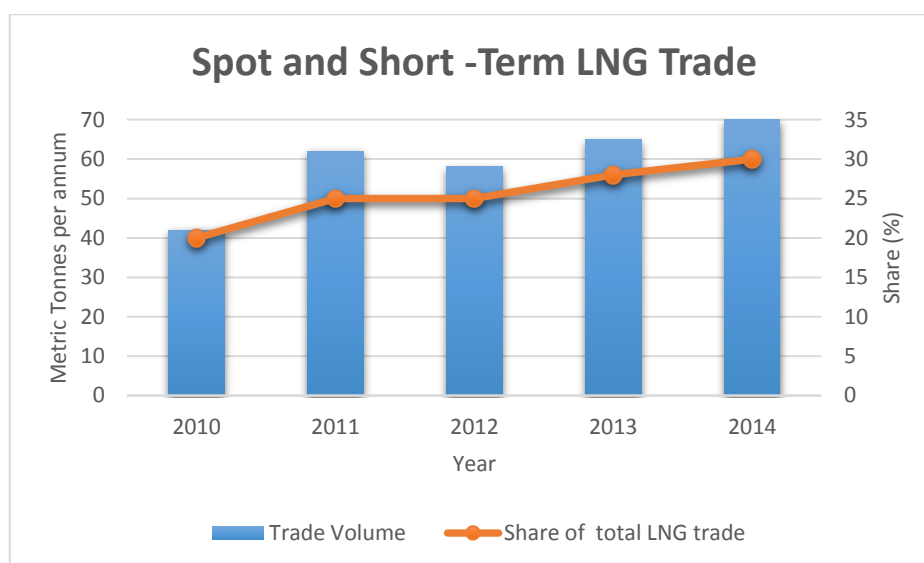
Country	Price (US\$/mmbtu)
Russia (Western Line)	12.15
Russia(Blue Stream)	12.12
Azerbaijan	9.88
Iran	14.36

Table4: Natural Gas price for Turkey in 2013

Source: Oxford Institute of Energy Studies, Naturalgaseurope.com

Future Prospects

The price of natural gas in US has remained lower than Europe and Asia since 2009 and this has increased the appetite for short-term supply contracts and spot trade of LNG. Spot and short-term markets offer buyers the ability to satisfy unexpected shortages at competitive prices and suppliers the flexibility to arbitrage prices between alternative LNG markets. The continuously increasing share of spot or short-term trade as a proportion of total LNG trade highlights this trend.



Note: Spot/Short-term is defined as less than 4 years in duration

Figure1: Growing share of spot/ short-term LNG trade

Source: GIIGNL

The Cheniere Energy's Sabine Pass terminal in Louisiana, which is expected to start operations this December, has signed contracts on the basis of spot prices in Henry Hub (refer table5). This is supposed to accelerate the shift of LNG importers away from oil-indexed contracts.

Even though the latest developments and observed trends are pointing to global LNG markets in the long run, long-term supply contracts are expected to dominate the market till at least 2020.

Analysis of Potential Impact

The decline in oil prices and de-linking of oil and gas prices in Europe has changed the economics of LNG exports from US completely. According to World Bank Commodity price data, average annual price for natural gas was US\$16.1/mmbtu in June 2013. Currently, the spot price of LNG at all major world terminals is below US\$7.5 (refer table2 and table3).

Table 5 shows the breakup of cost for LNG exports from US to Europe as per the terms of long-term contracts signed by Cheniere for its Sabine Pass LNG facility. The facility is scheduled to begin operations in Q4 2015.

Component	Price (US\$/mmbtu)	
Henry Hub Cost	2.89	
Procurement and fuel costs	3.32	115% of the Henry Hub price
Capacity fee	3.00	Fixed; has to be paid whether buyer uses the booked capacity or not.
Shipping, insurance and other charges	0.70-1.70	
Price at terminal	<u>7.00-8.00</u>	

Table5: Total cost of US LNG for a European importer at the terminal

Source: Cheniere Energy's 8-K filing from August 11, 2014

For selling to Asian markets, the shipping costs would be higher due to longer distances, making the export commercially unviable in most cases. At a cost of around US\$11/mmbtu in Japanese market, US LNG exports can find their way into the Asian markets.

In the light of information discussed above, following would be the key potential impacts on Europe:

- Assuming all the other contracts for US LNG exports would follow a similar arrangement, we can clearly see that US exports are marginally competitive for terminals in Spain and UK and not commercially viable for other European terminals at current prices.
- With American gas prices expected to rise in the short term as they are not linked with oil price, US LNG exports would not be commercially viable for most of the European market.
- Though US LNG would not be imported on a large scale in Europe, it would have an indirect impact on European energy costs and security.
- The additional 109 bcm of currently approved capacity would increase Europe's leverage in future price negotiations. A similar effect was seen when US shale boom took place over the last decade. As imports by US declined, the supply that was earlier US bound, pushed prices down in European markets.
- The US exports would also place an upper cap on the prices that Gazprom can push for in future price negotiations as Europe. With LNG capacity of 207 bcm per year, Europe can import two-thirds of its total natural gas needs via its LNG terminals.
- From the point of view of energy security, some European countries, like Lithuania, have shown interest in buying from alternative sources if the price is comparable to the Russian

supply. So, if price is not the only criteria for choosing the gas supplier, then there can be some improvement in the energy security of the continental Europe.

- In the long run, it would not be possible for US LNG exports to compete with Russian pipeline supplies or Qatar's LNG exports on price. The Henry hub price is already too low and is expected to go up while US shale gas will not be able to match the operational costs of Qatari and Russian operations.
- The impact in the short term is going to be negligible as only one of the facilities is expected to be completed by this year and most of the exports would be added only after 2017.
- The trade with Asia can be commercially viable for US LNG companies if by 2018 the oil prices recover to above US\$75. The prices in Japanese spot market would go up to US\$11/mmbtu at that price-level, as per Credit Suisse estimates.
- If prices are commercially viable in Asia, and US is able to capture some of the market when long-term contracts in the region expire, gas prices in Europe would come under pressure. This would also increase Russia's dependence on the European gas market.

The potential impact on Turkey is discussed below:

- The country could be the biggest beneficiary of the US LNG exports as it currently receives gas above US\$12/mmbtu from Russia and above US\$14/mmbtu from Iran.
- In addition to the higher prices, BOTAS, the state owned petroleum pipeline corporation, has paid over US\$5 billion in penalties to Russia and Iran because it has not been able to meet its take-or-pay obligations. This has been largely due to inadequate compression capacity in the eastern part of the country.
- Thus, if it is able to fully utilise its 14.2 Bcm/y LNG terminal capacity to import LNG from US at a price of US\$7 –US\$8/mmbtu, Turkey can considerably reduce its import bill of natural gas.
- The long-term contracts are up for renewal in 2021 and US LNG exports can help Turkey negotiate a better deal with Iran and Russia that is closer to European spot prices.
- To take the full advantage of this development, Turkey would have to invest in its LNG terminals and increase capacity to substitute the expensive pipeline imports with LNG. Currently, only 15% of the total demand is fulfilled by LNG at around 80% utilisation.

Conclusion

To sum up, Europe would not have a huge direct advantage because of US LNG exports but would reap indirect benefits because of increased total supply of natural gas. However, Turkey which imports 98% of its natural gas requirements can benefit directly because its long-term contracts with Russia and Iran are priced more than 50% higher than the US LNG.

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About Energy Mining Advisory Partnership

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