From:	Hal Miller
To:	LNGStudy
Cc:	Alina Dumitrasc; Jeff Pendergraft
Subject:	2012 LNG Export Study
Date:	Monday, February 25, 2013 4:11:24 PM
Attachments:	2012 LNG Export Study - Galway Group Reply Comments.pdf

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Please find attached our reply comments regarding the 2012 LNG Export Study.

Thank you.

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February 25, 2013

The Honorable Steven Chu
Secretary
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585
RE: 2012 LNG Export Study

Dear Secretary Chu,

Thank you for the opportunity to comment on the 2012 LNG Export Study as part of the reply comment period.

As an energy consulting firm, Galway Group has almost two decades of experience providing transactional support and market analysis to American and international companies across the natural gas and LNG value chain. Based on our experience in the natural gas industry, Galway Group strongly agrees with and supports the NERA study's finding that "across all scenarios, the U.S. was projected to gain net economic benefits from allowing LNG exports."

In recent months, we have closely followed the debate over LNG exports. We are deeply concerned with the lack of factual data to support the claims made against LNG exports. The reply comments included herein seek to bridge some of the gaps in the analysis that has been submitted to your attention to date. We address four of the main concerns with the NERA study and with its findings that have been brought up during the initial comment period:

1. **Data accuracy**: The view that more recent (post-2010) natural gas production, reserve and demand estimates, would lead NERA to draw a different conclusion in its analysis of LNG exports.
2. **Price volatility**: The assumption that approval of additional LNG exports would lead to a

spike in natural gas price volatility.

3. **Foreign demand surge**: The concern that US LNG exporters and natural gas producers will face surging demand from abroad.
4. **LNG buyer motivations**: Concerns over the fact that foreign direct investment (FDI) in American LNG projects would result in export decisions being made based on the national interest of the countries where investors are headquartered.

1. Data accuracy: Some initial comments submitted to the DOE in January 2013 expressed the concern that NERA's conclusion – that LNG exports will benefit the US economy – is incorrect because it uses dated estimates for production, demand and recoverable resources. While Galway Group agrees that the Energy Information Agency's 2011 Annual Energy Outlook (AEO) production and demand estimates used by NERA are dated, and have since been revised, we believe that using more recent data would further strengthen NERA's conclusion that LNG exports benefit the US economy. Included herein is an analysis of North American production, demand and reserve estimates that, we hope, will provide a more accurate picture of the domestic natural gas market dynamics.

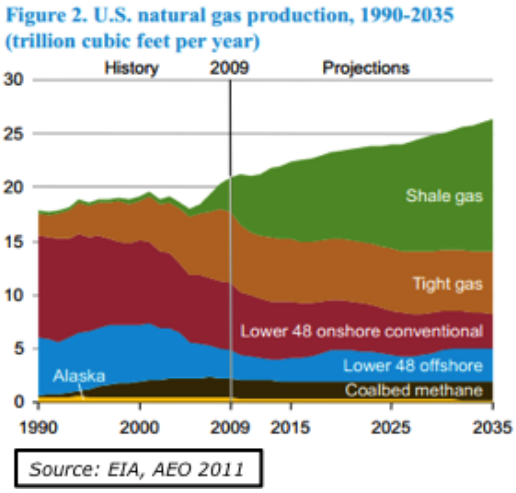
Accurate reserve, production and demand estimates are central to assessing the impact of LNG exports on US consumers and the American economy. Our analysis shows that the EIA, in its AEO 2011 report, significantly underestimated US natural gas recoverable resources and production potential. With reserve estimates that are higher than previously estimated, we can rest assured that domestic demand will be met and excess natural gas capacity will be available for export.

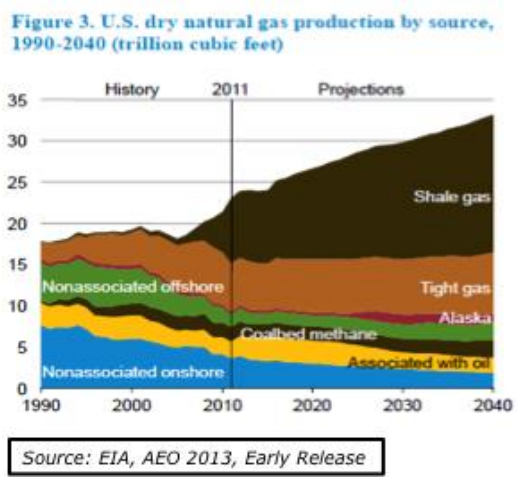
US Production & Consumption Estimates

Compared to the AEO 2011 report, in its AEO 2013 early release the EIA revised its own estimates to reflect higher production levels:

- In AEO 2011, 2035 production was estimated at 26.32 Tcf by EIA
- In AEO 2013, 2035 production is estimated at 32.04 Tcf, representing a 21.7% increase from earlier estimates.

Figure 1: US natural gas production; AEO 2011 v. AEO 2013





It is important to note that these estimates only take dry gas production into account. Including the production of natural gas liquids would further increase production estimates.

For the 2011-2035 period, in its AEO 2013 early release the EIA estimates that consumption will increase by less than 20 percent. Hence, domestic natural gas production will grow at more than twice the rate of demand through 2035. At these levels of domestic production, the EIA estimates that US natural gas production will exceed consumption by 2020, when significant volumes of

gas will become available for export via pipeline and LNG.

Natural gas production levels have remained robust over the last few years, despite record low natural gas prices. This is due, in part, to existing contracts that require companies to maintain certain levels of drilling activity in order to retain their land leases. Additionally, plays that are abundant in natural gas liquids – fuels that are priced at a higher price point relative to dry gas - have ensured profit margins for gas producers and have incentivized continued natural gas production. However, if the price of gas remains at current unsustainably low levels, upstream companies will eventually decrease their production to minimize losses. We are already experiencing a decrease in drilling activity, which is likely to continue absent an export market that can absorb new US natural gas production.

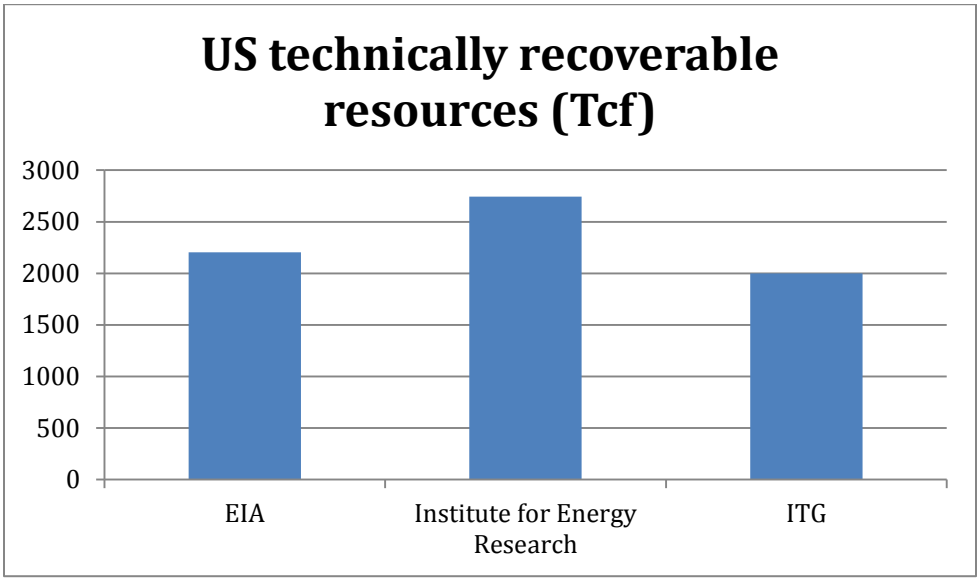
Conclusion #1: Domestic natural gas production, as estimated by EIA in 2013, will grow at over twice the rate of demand through 2035, with US natural gas production set to exceed consumption by 2020. EIA's revised estimates make a stronger case in favor of LNG exports, which can provide new markets for excess US natural gas production.

US Recoverable Resource Estimates

In its AEO 2011 analysis employed by the NERA study, EIA uses resource estimates that are more conservative compared to more recent estimates by industry players. Since 2010, reserve estimates have grown significantly as reported by various organizations including the Institute for Energy Research (IER), the American Exploration and Production Council, and revised EIA estimates. A comparison of more recent reserve estimates is provided in Figure 2.

Today, US technically recoverable natural gas resources are estimated at over 2,200 Tcf. At 2011 production levels of 23.51 Tcf, available recoverable resources are sufficient for over 93 years. It is important to note that these resource estimates do not take into account future technological advancements, which result in significantly higher volumes of economically recoverable natural gas.

Figure 2: US natural gas recoverable resource estimates, various sources



Conclusion #2: Natural gas recoverable resources are significantly higher than previously estimated, not accounting for technological breakthroughs, which could further increase resource estimates. Revised estimates make a stronger case in favor of LNG exports, which can provide new markets for excess US natural gas production.

North American Cumulative Natural Gas Resources and Production

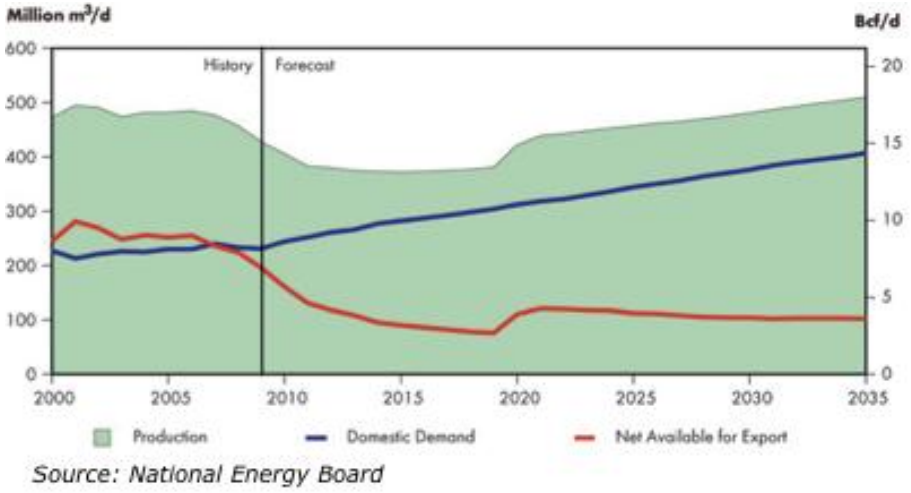
The North American natural gas market, including Canada and Mexico, is highly integrated and interconnected. Gas produced in the US can move easily to Canada and Mexico, and vice versa. Natural gas produced in the US can either be consumed domestically, or exported to Mexico and/or Canada.

Both Canada and Mexico are estimated to have large recoverable resources of natural gas, and are unlikely to be able to absorb additional volumes of US natural gas. American gas exported to Canada is likely to displace gas on the domestic market in Canada, and free up Canadian gas volumes for export. US shale gas is not only decreasing Canadian exports into the US; it is also displacing gas in the domestic market in Canada. At the moment, Marcellus natural gas production, for example, is displacing Western Canadian gas supplies in the Eastern Canadian market. This pattern is likely to continue, and incentivize LNG exports from Canada, once Canadian LNG export projects come online.

Canada is estimated to have over 1,500 Tcf natural gas resources. Combined, US and Canadian resources yield close to over 3,700 Tcf of technically recoverable gas reserves. According to the EIA, Mexico has the fourth-largest reserves of shale gas deposits in the world, up to 680 Tcf of natural gas. At current levels of demand, this natural gas reserve capacity would be sufficient to cover Mexico's domestic demand (8.69 bcf/d in 2012 according to SENER – Secretaria de Energia) for 200 years. According to the AEO 2013 early release, estimated US production is 32.04 Tcf in 2035, while gas demand lags behind at 29.06 Tcf. The difference between demand and excess production is approximately 3 Tcf, representing the amount of natural gas that is available for export. In Canada's case, over 20% of production, approximately 4 bcf/d, is

available for export by 2035, as seen in Figure 3.

Figure 3: Canada - natural gas demand and production



Given the large North American reserve estimates and production potential, as well as the domestic demand projections that are lower than projected production, it is likely that North American natural gas will need to find new demand centers on the international market. The Canadian government has shown a predilection to support the export of natural resources, and is likely to be supportive of LNG export projects.

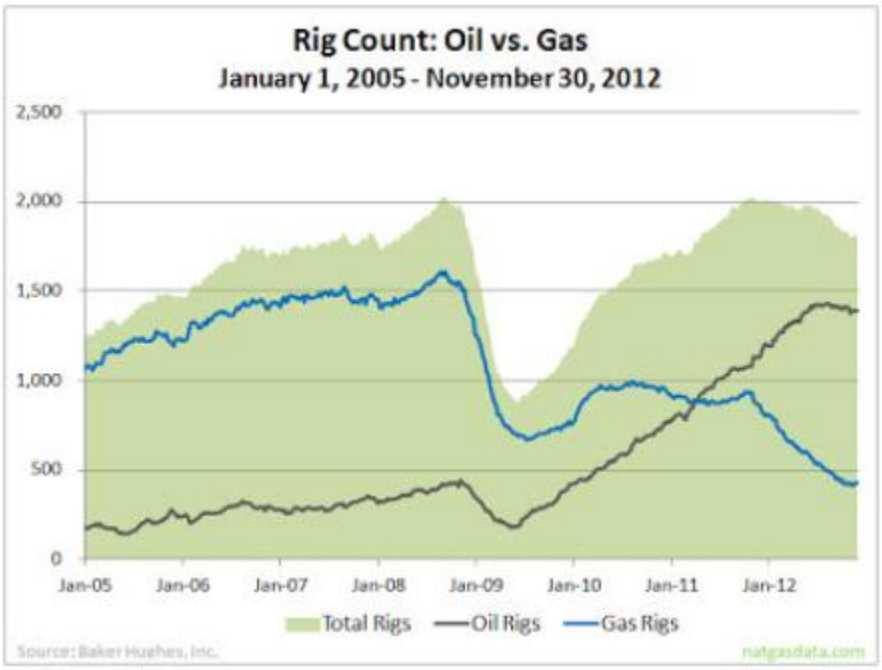
Conclusion # 3: Blocking LNG exports from the US will not stop US gas molecules from leaving the country. US natural gas exported to Canada will likely act as an enabling factor for Canadian LNG projects, freeing up Canadian gas for export. It will likely result in US export projects being left out of the global race to capture LNG market share.

Impact of Insufficient Domestic Demand on Production

Absent an export market to absorb the excess capacity of natural gas produced in the US, domestic demand is insufficient to ensure current levels of gas production. Production will eventually drop, despite the availability of natural gas liquids that currently make production

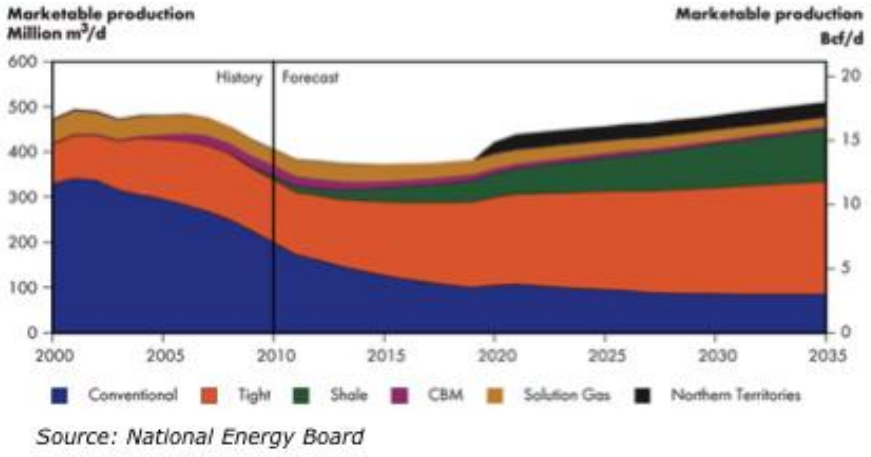
economical at dry gas prices that are below breakeven costs. Already, the surplus of natural gas has depressed prices for producers making drilling unprofitable in some cases, as indicated in the initial comments submitted to the DOE by the Oil Region Alliance, with the number of rigs having dropped to a record low for the past 10 years. Figure 4 depicts the fall in the number of gas wells since 2005.

Figure 4: US Rig Count, 2005-2012



Canada provides some insight into the chilling effects of insufficient domestic demand to sustain and boost production of natural gas. As seen in Figure 5, since 2008, Canadian natural gas production dropped 15% due primarily to a drop in natural gas prices and an excess supply on the domestic market. Production of natural gas is not expected to increase in Canada until, and unless, LNG export projects are developed opening up new commercialization opportunities for Canadian natural gas.

Figure 5: Canadian natural gas production, 2000-2035 (NEB, 2010)



In the US, a decrease in natural gas production is likely to result in lost jobs and lost opportunities to create additional employment for American workers in the gas upstream, midstream and downstream industrial segments, including in drilling and drilling services, pipelines, gas processing and treating, and liquefaction.

Conclusion #4: Unless the US can provide additional market outlets for US natural gas, US gas production will soon outpace consumption and will result in a drop in production activity with adverse impacts on employment and the US economy.

2. **Price volatility**: Some comments submitted to the DOE in response to the NERA study imply that approval of additional LNG exports would lead to a spike in natural gas price volatility. Galway Group believes that these concerns are unfounded, and rest on a flawed understanding of natural gas market conditions.

According to EIA's AEO 2013, the Henry Hub (HH) price of domestically produced natural gas reaches only $5.40/MMBtu by 2030 from the below $3/MMBtu levels in 2012. Furthermore, US natural gas prices are expected to follow a seasonal pattern – with slightly higher prices during the winter months when domestic demand for heating rises. Price volatility is unlikely beyond seasonal variation. According to a recent Deloitte study, *Exporting the American Renaissance: Global Impacts of LNG Exports from the United States*, with 6 bcf/d of US LNG exports, the overall impact of exports on US citygate prices is projected to be a low $0.15/MMBtu, from 2016 through 2030. This is hardly a significant increase in price or price volatility.

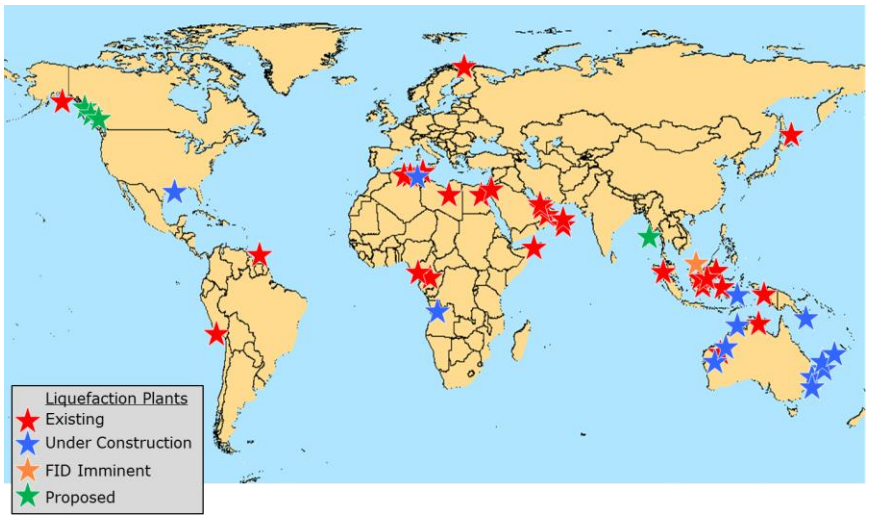
On the contrary, a slight increase in natural gas prices is needed for production of dry gas to become economical and to meet the needs of the domestic market at reasonably low prices. As is the case with supply and demand dynamics in all markets, the interplay between production breakeven costs and demand for gas will determine total gas production in the US. For the lower 48 states, the breakeven cost for natural gas wells is estimated at $4.32/Mcf by ITG Investment Research. Furthermore, ITG estimates that 600 Tcf reserves are recoverable at $4/Mcf. What becomes apparent from the ITG and other industry studies, is that at current natural gas prices that are below the $4 level, production is unsustainable over the long-term. In this context, export markets are needed to provide an outlet for US production and slightly increase gas prices to cover the cost of production and ensure the full-scale development of US resources. Full-scale development of US shale gas plays could, in turn, result in one million manufacturing jobs by 2025, as stated by the National Association of Manufacturers in the organization's initial comments to the DOE.

Conclusion #5: The approval of additional LNG exports to non-FTA countries is unlikely to result in natural gas price volatility. Exports will likely result in a slight increase in natural gas prices, an increase that is needed to ensure the continued development of US natural gas resources.

3. Foreign demand for US gas: Claims that US producers will be faced with surging foreign demand for US natural gas, and will, as a result, be unable to deliver sufficient supply at the expense of US consumers, are unfounded. Global demand for LNG is a function of commercial considerations primarily, and of the cost-competitiveness of available LNG projects.

Included below, is an overview of LNG markets, which we hope will provide some insight into global LNG supply/demand dynamics.

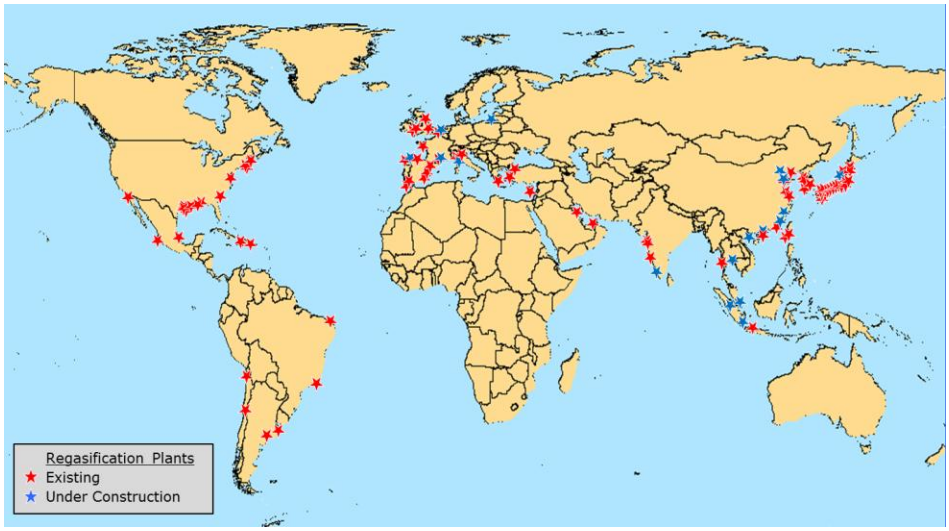
Figure 6: Existing and proposed LNG liquefaction projects (LNG supply capacity)



Global LNG liquefaction capacity is projected to expand significantly by the end of the decade, resulting in an increasingly competitive market environment that limits the amount of American LNG supplies the market is able to absorb. As seen in Figure 6, a large number of LNG liquefaction projects are under construction. Over 700 million metric tons (MM mt) of capacity is

expected to come online before the end of the decade, including projects that are under construction, in the front-end engineering design (FEED) process, commissioning, under expansion, or greenfield concepts. If all proposed projects and expansions come to fruition, the global LNG supply is set to reach approximately 1,000 MM mt, a significant departure from the current capacity of 260 MM mt.

Figure 7: Existing and future global LNG regasification projects (LNG demand capacity)



Proposed LNG regasification terminals, which represent an indication of the demand side of LNG markets, are projected to increase global demand for LNG by approximately 500 MM mt – compared to the projected more than 700 MM mt increase in the global LNG supply before the end of the decade. Overall, global LNG supplies are expected to outpace demand by the end of the decade, provided that all proposed projects are built as scheduled.

Given the projected excess capacity, LNG suppliers will face increased competition in their marketing efforts. In the context of heightened global competition, it is likely that not all proposed US projects will be built. Only projects that can compete with supplies from other major LNG exporting countries such as Canada, Australia, and Qatar will be able to secure long-term or

spot market buyers. Recall that, only seven years ago, of the 35 onshore and 15 offshore LNG import terminals that were proposed in the US, only five onshore and three offshore LNG importing terminals were built.

US LNG suppliers are in a unique position to be able to meet global demand before additional projects are scheduled to come online internationally before the end of the decade. While foreign projects are impaired by challenges associated with remoteness, lack of infrastructure, and challenging environmental conditions, the US is in a position to capitalize on existing terminals and infrastructure that are currently idle or underutilized. Existing import terminals can be more easily converted to export terminals and new terminals can be built using existing infrastructure and domestic expertise, providing Americans with access to lucrative employment opportunities and export revenues.

Conclusion #6: A surge in global demand for US LNG is unlikely, especially given the number and capacity of LNG liquefaction terminals that are scheduled to come online by the end of the decade. Today, the US is in a good position to gain market share and capitalize on the benefits provided by its abundant natural gas resources.

4. LNG buyer motivations: One of the concerns stated in relation to LNG exports pertains to speculations regarding the motivation behind FDI in American LNG projects. Galway Group finds that export decisions made by LNG terminals in the US are made based on economic considerations, and are not influenced by the national interests of foreign countries or investors.

As seen in Figure 8, the vast majority of countries that import LNG are strategic US allies, whose economic growth and security (including energy security) is in the geostrategic interest of the US. By providing our allies with needed, reasonably priced energy resources, the US can help foster

economic growth in major Asian and European economies, according to analysis provided by Haynes and Boone LLP. LNG exports to non-FTA allies will likely have direct paybacks for the US economy, paybacks which have not been captured in the NERA study. Furthermore, based on our company's two decades of commercial and transactional advisory experience, sales and purchase agreements (SPAs) to buy/sell LNG are driven by rigorous business rationale, not by other exogenous considerations. Lastly, the majority of companies purchasing LNG capacity and investing in US natural gas infrastructure are publicly traded and, therefore, accountable to their shareholders and board of directors.

Figure 8: LNG importing and LNG exporting countries

Top Gas Importers in 2011		Top Gas Exporters in 2011	
Country	Net Imports (Bcfd)	Country	Net Exports (Bcfd)
Japan	10.3	Russia	18.5
Germany	7.0	Qatar	11.8
Italy	6.7	Norway	9.4
US	5.4	Canada	5.6
South Korea	4.8	Algeria	5.0
France	4.3	Other Africa	4.1
Turkey	4.0	Indonesia	3.7
Ukraine	3.9	Netherlands	3.5
United Kingdom	3.6	Australia	2.5
Spain	3.4	Trinidad and Tobago	1.8

Source: BP Statistical Review (2012)

To date, US LNG export terminals have made contractual commitments to export LNG in a total amount of 41.1 mtpa (5.3bcf/d). Buyers of US LNG include Osaka Gas, GAIL, Total, Chubu Electric, Tokyo Gas, Mitsubishi, Mitsui, Gas Natural, GDF Suez, BP, Kogas, and BG, all of which are energy companies or utilities that are headquartered in Japan, Korea, India or Europe. Also significant is that buyers that have commitments with US liquefaction terminals have also committed large amounts of financing toward the development of US gas infrastructure,

including upstream oil and gas, midstream, and LNG liquefaction infrastructure.

Conclusion #6: LNG sale and purchase decisions are made based upon commercial and marketing considerations. Nonetheless, and irrespective of the nationality of LNG buyers, a moratorium on LNG exports to non-FTA countries would cost the US economy many future job creation opportunities in construction, engineering, pipelines, gas processing, and liquefaction terminal operations.

We conclude with a mention of additional factors that ought to be considered as part of the decision making process over LNG exports. As stated in Deloitte's *Global Impacts of LNG Exports from the U*S study, the global impact of US LNG exports could be more than the relative size of the exports. LNG exports will "hasten transition" to a global pricing system under which the price of natural gas is de-linked from oil-indexed pricing "by applying competitive pressure on all gas suppliers." De-coupled natural gas prices would ensure more affordable natural gas supplies for our geostrategic allies. Secondly, Haynes and Boone points to the environmental benefits provided by natural gas: the US can provide energy users in Asia and Europe with a dependable, reasonably priced low-emission fossil fuel, providing a cost-effective means of reducing emissions of greenhouse gases and other pollutants. Lastly, the US is a leader at the World Trade Organization, where it has advocated for free-market policies. The US has challenged other countries when these countries have broken WTO rules. It would, therefore, be a step back for our country to treat LNG exports differently than exports in other market segments.

Kind regards,

Hal Miller
General Partner
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