From:	Jason Smith
To:	LNGStudy
Subject:	2012 LNG Export Study (Reply Comments)
Date:	Monday, February 25, 2013 2:09:47 PM
Attachments:	ANGA DOE Comments - Feb 25 FINAL.pdf

Please consider this attachment ANGA's submission of reply comments to initial comments filed on DOE's 2012 LNG Export Study. Please let me know if you have any questions.
Thank you,

Jason Smith
America's Natural Gas Alliance
Coordinator, Research and Regulatory Affairs
(o) 202-715-1713
(c) 703-409-5169
701 Eighth Street NW, Suite 800
Washington, DC 20001

February 25, 2013

U.S. Department of Energy (FE–34)
Office of Natural Gas Regulatory Activities
Office of Fossil Energy
P.O. Box 44375
Washington, DC 20026–4375

Re: 2012 LNG Export Study (Reply Comments)

Dear Secretary Chu:

America's Natural Gas Alliance ("ANGA") appreciates the opportunity to submit these Reply Comments in response to the Department of Energy (DOE), Office of Fossil Energy's request for comments on the NERA Economic Consulting ("NERA") Report *Macroeconomic Impacts of Increased LNG Exports from the United States* (the "NERA Report"). DOE commissioned the LNG Export Study to inform DOE's decisions on applications seeking authorization to export liquefied natural gas (LNG) from the lower-48 states to non-free trade agreement (FTA) countries. ANGA submitted Initial Comments in response to the NERA Report. We offer these Reply Comments based on a review of the issues raised by other commenters.

ANGA is an educational and advocacy organization dedicated to increasing appreciation for the environmental, economic, and national security benefits of North American natural gas. ANGA's members include the leading North American independent natural gas exploration and production companies. The collective natural gas production of the ANGA member companies is approximately nine trillion cubic feet per year, which represents about 40 percent of the total annual U.S. natural gas supply.

As indicated in our initial comments, ANGA strongly supports the country's ability to export natural gas. As is the case with any product or commodity, when free trade is allowed to flourish our economy enjoys greater prosperity, our people greater economic benefits, and our workers more and better jobs. Imposing arbitrary limits on free trade, including exports of LNG, would be a short-sighted mistake. The U.S. now has new opportunities to capture significant economic, environmental, and energy security benefits

by both expanding domestic markets and expanding into international markets for natural gas.

1. LNG Exports will Naturally Adjust to the Size of the Resource Base.

Some opponents of LNG exports criticize the NERA Report for not including scenarios in which U.S. natural gas supply fails to keep pace with higher demand. In fact, NERA relied on a wide range of U.S. supply curves, and in all cases, there are net economic benefits to the United States.

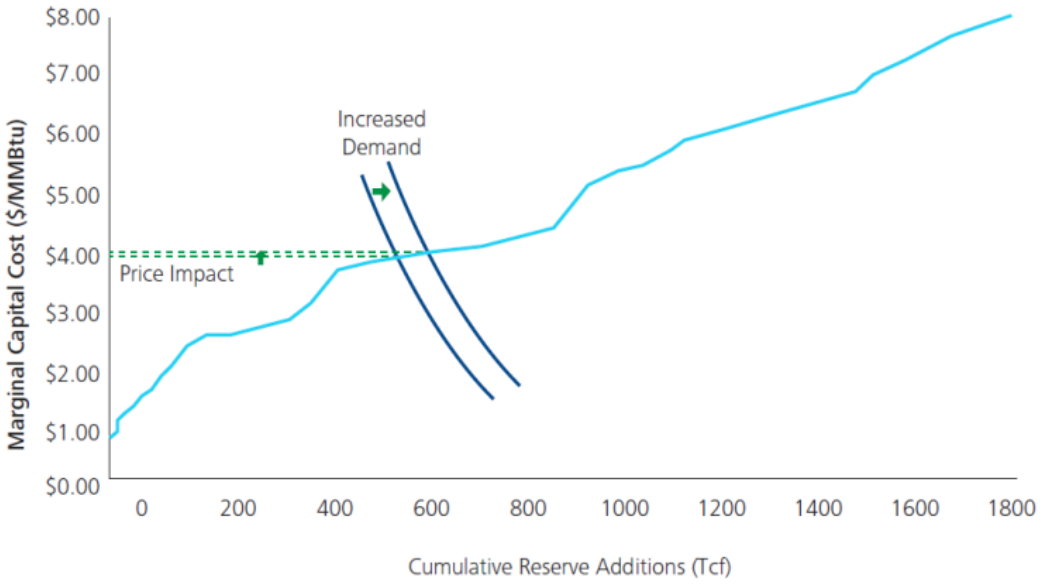
NERA's three U.S. supply scenarios included: (1) the Annual Energy Outlook (AEO) 2011 Reference case; (2) a High Shale Estimated Ultimate Recovery case, with the Estimated Ultimate Recovery (EUR) per shale gas well for new, undrilled wells assumed to be 50 percent higher than in the Reference case; and (3) Low Shale EUR case, with lower assumptions about domestic natural gas supply. This range of potential supply scenarios covers all realistic outcomes. According to the NERA Report, "outcomes of the EIA high demand case fell between the high and low EUR cases, and therefore would not have changed the range of results."[1] EIA's AEO 2011 estimates that there are over 2,543 trillion cubic feet (Tcf) of technically recoverable natural gas resources in the United States (as of January 1, 2009).[2] EIA's technically recoverable resource (TRR) estimate includes a combination of both "proved" and "unproved" resources. Unproved resources are additional volumes estimated to be technically recoverable with the application of current exploration and production technologies. In particular, EIA has increased its estimates of U.S. shale gas resources, based on updated assessments prepared by the United States Geological Survey (USGS).

Other independent analysts estimate that U.S. natural gas resources are higher than EIA's estimates. ICF International has conducted its own "bottom-up" assessment of detailed geological data, development feasibility factors, and well recovery and production profiles.

[1] Macroeconomic Impacts of LNG Exports from the United States, NERA Economic Consulting, p. 4.
[2] U.S. EIA. Annual Energy Outlook 2011. Oil and Gas Supply Module. Table 9.2. Technically recoverable U.S. natural gas resources as of January 1, 2009.

ICF estimates that the U.S. has 3,105 Tcf of gas resources remaining to be developed with current technologies (22% higher than the AEO 2011 estimate).[3] According to ICF, the USGS estimate incorporates production assumptions that are conservative when compared to actual well data obtained by the State of Pennsylvania and other sources.[4] Similarly, a recent report from the National Petroleum Council summarized various resource estimates and found that the U.S. technically recoverable resource base could be as high as 3,600 Tcf.[5] This represents well over 100 years' worth of U.S. supply at current consumption levels.

The massive scale of the U.S. shale gas resource has flattened the U.S. natural gas supply curve. As a result, incremental demand from LNG exports are projected to result in small price impacts, as illustrated in the figure below from the Deloitte Center for Energy Solutions.[6] As discussed in more detail in our comments, Deloitte expects only marginal increases in U.S. natural gas prices due to U.S. LNG exports: about $0.15/MMBtu from 2016 to 2030.[7]



[3] ICF International. Assessment of New York City Natural Gas Market Fundamentals and Life Cycle Fuel Emissions.
[4] Ibid.
[5] National Petroleum Council. Prudent Development: Realizing the Potential of North America's Abundant Natural Gas and Oil Resources. Chapter 1, p. 47 ff.
[6] Deloitte Center for Energy Solutions and Deloitte MarketPoint LLC. Exporting the American Renaissance Global impacts of LNG exports from the United States.
[7] Ibid.

Evaluating a scenario in which U.S. natural gas supplies are further constrained in the model, beyond the Low Shale EUR case, would add nothing to the analysis. Under a low shale gas outlook, domestic prices rise and LNG exports drop to zero or very low levels. Assuming further constraints on production would simply produce the same result.

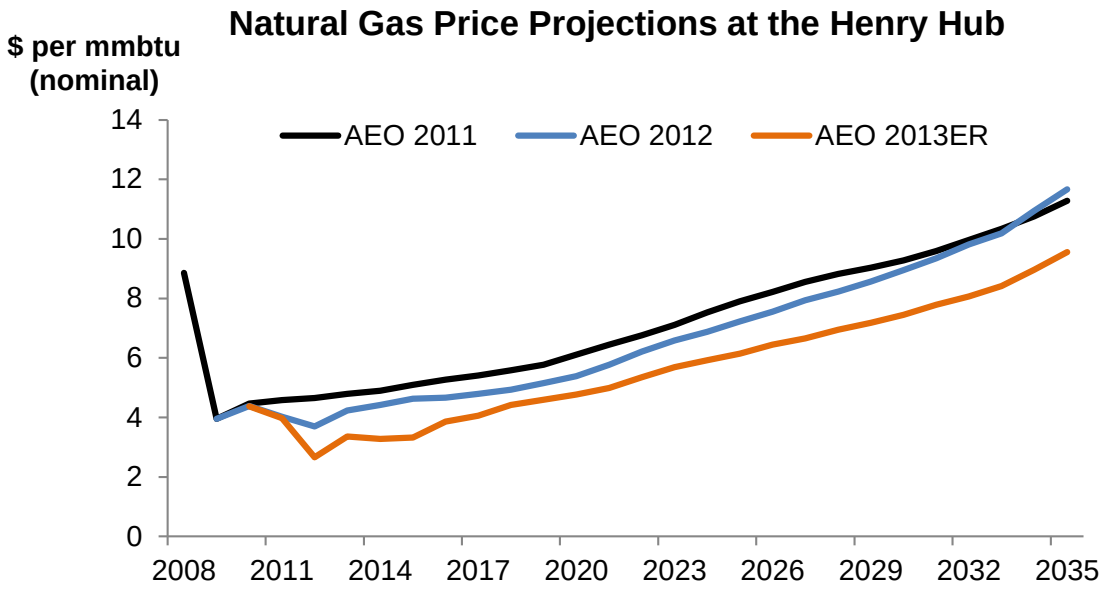
Other respondents have argued that U.S. supply could be curtailed due to regulatory burdens. For example, one of the respondents argues that the NERA Report fails to consider a scenario in which additional environmental regulation curtails natural gas production.[8] We address the issue of environmental regulation in Section 6 below.

2. Updated EIA Assumptions Demonstrate Expanded Potential for Gas.

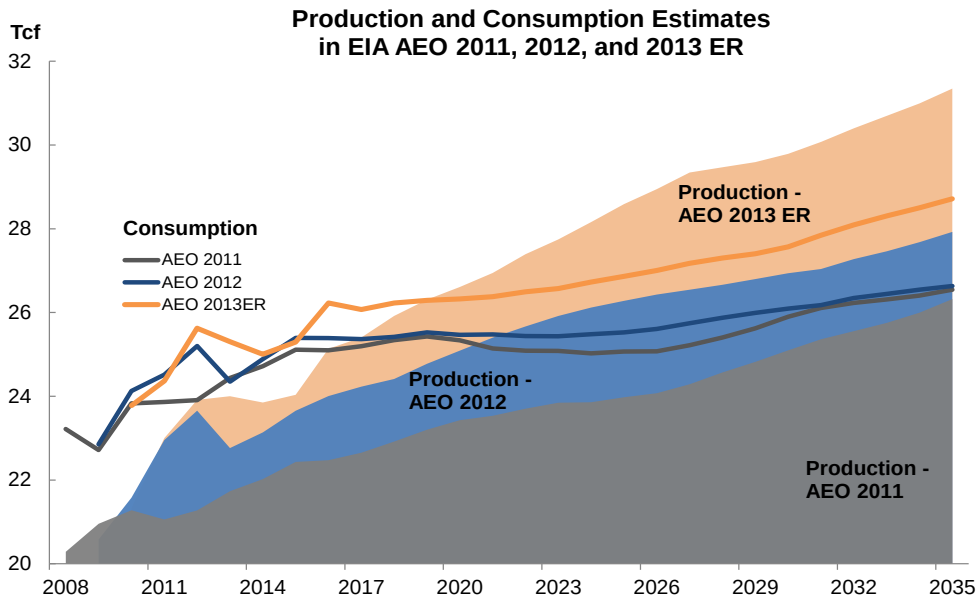
The NERA Report is based on the EIA AEO 2011 and International Energy Outlook (IEO) 2011. AEO 2011 and IEO 2011 were released in April 2011 and September 2011, respectively. Commenters have suggested that price impacts from LNG exports may be understated, because the AEO/IEO 2011 projections of domestic demand do not fully reflect recent demand growth in the industrial, manufacturing, and power sectors.[9] If the NERA Report were to reflect this recent demand growth, the commenters argue, price impacts would necessarily be greater than the estimates provided in the NERA Report.

In fact, data from the more recent AEO 2012 and AEO 2013 Early Release suggest just the opposite. It is true that the rebound of U.S. economic activity since 2009 has led to higher levels of consumption than were projected in the AEO 2011. But even with higher demand, domestic natural gas prices are lower than initially projected, as natural gas producers continue to innovate, increase production efficiencies, and drive down production costs. As shown in the figure below, EIA has consistently lowered its price projections for natural gas since issuing the AEO 2011. AEO 2013 Early Release price projections for 2035 are 15% lower than the AEO 2011 projections.

[8] See, for example, the comments of Dow Chemical.
[9] See, for example, comments submitted by: U.S. Representative Edward Markey, Dow Chemical, Citizen Power, Industrial Energy Consumers of America, and American Forest & Paper Association.



The latest figures from EIA also forecast significantly higher natural gas production, compared to the data used in the NERA Report. The figure below compares the EIA forecasts of natural gas production and consumption, as reported in the AEO 2011, 2012, and 2013 Early Release. The AEO 2013 Early Release projects that natural gas consumption will be 8% higher in 2035 than the AEO 2011 forecast used by the NERA Study. This increase is due to higher projected consumption for industrial uses and electric power generation. However, more than offsetting that increased consumption, the AEO 2013 Early Release projects production levels in 2035 to be 19% above the AEO 2011 projection. There is no indication of a coming reversal to this trend. Robust domestic production has the potential to support greater consumption from both the growth of U.S. domestic demand as well as LNG exports.



3. The Market Should Dictate Export Capacity Investment.

Several of the letters commenting on the NERA Report cite the potential for large volumes of LNG exports and, as a result, suggest the potential for major effects on the U.S. economy.[10] However, the reality is that export volumes are almost certain to be significantly lower than suggested by the number of permit applications under review because of international market factors, which will serve to moderate export volumes, and the capital intensive nature of the industry, which will limit export terminal construction. Several independent assessments, including the NERA Report, conclude that the international market for LNG will naturally limit the volume of economically viable U.S. LNG exports, even without any government intervention, and the development of LNG export terminals is likely to have only modest impacts on domestic natural gas prices.

As with LNG import terminals, market conditions should be the primary factor moderating the number of export terminals ultimately constructed, and the volumes of natural gas exported to foreign markets. The long list of natural gas market drivers includes: natural gas prices in the U.S., the potential for development of foreign shale gas reserves, increased

[10] See, for example, Craig Holt Segall, Nathan Matthews, Ellen Medlin, Attorneys, Sierra Club Environmental Law Program. Letter to Secretary Chu. January 24, 2013.

export capacity among competing LNG exporters, demand patterns in key export markets, lending limits imposed by the capital markets, and LNG supplier and exporter responses. All of these factors will affect the economic incentive to export LNG from the U.S. and, therefore, influence the total number of export facilities developed.

The Bipartisan Policy Center (BPC) has been evaluating the potential impacts of U.S. exports of LNG. In its comments to DOE, the BPC emphasizes that "[d]ecisions by entities to export U.S. LNG will be made in an international framework that takes into account the U.S. natural gas price, transportation, liquefaction facility capital costs, and the price and demand in target foreign markets." In this international market framework, the BPC concludes that LNG export levels will adjust as domestic prices rise or fall, and are likely to have only modest impacts on domestic natural gas prices.

Similarly, the Deloitte Center for Energy Solutions projects that international market factors will be a binding constraint on U.S. export volumes. Deloitte expects only marginal increases in U.S. natural gas prices due to U.S. LNG exports: about $0.15/MMBtu from 2016 to 2030.[11] The Deloitte study explains that some European markets are decoupling from oil-indexed prices and the same may occur in Asian markets, as Australian LNG exports continue to grow. According to Deloitte, "[i]f Asian markets decouple from oil-indexed prices, their prices could drop sharply over the next several years. Since supplies for U.S. LNG exports are expected to be pegged to U.S. gas prices (e.g. Henry Hub), rather than oil prices, the incremental volumes could result in global gas markets transitioning more rapidly to prices set by "gas-on-gas" market competition."[12] As a result, Deloitte expects the market to limit the volume of economically viable U.S. LNG exports without government intervention.

Furthermore, Medlock emphasizes that: "allowing exports does not mean exports will occur in any particular volume, and policymakers should understand this very salient point. Regional price differentials around the globe will be affected by LNG trade because

[11] Deloitte Center for Energy Solutions and Deloitte MarketPoint LLC. Exporting the American Renaissance Global impacts of LNG exports from the United States.
[12] Ibid.

prices both domestically *and* abroad will be influenced by the introduction of trade. As prices adjust to new volumes there will be a feedback that is important in determining the volume of trade that ultimately occurs."[13] Medlock concludes that market adjustments will ultimately limit the construction and utilization of terminal capacity, much like the experience with LNG import facilities.

Recent history demonstrates that project proposals are likely to far exceed the number of terminals that are actually constructed. For example, in the early 2000s, 47 LNG import terminals were proposed to satisfy predicted U.S. natural gas supply shortages.[14] In the end, only eight of the proposed facilities were built, representing less than one quarter of the proposed capacity.[15] Dynamic market conditions, including rising shale gas production and lower domestic natural gas prices, conspired to render most of the proposed projects obsolete.[16] Market forces, not government intervention, imposed limits on capital investment.

In addition to natural gas market drivers, another factor will limit the number of projects that are ultimately constructed: the large capital cost ($5 to $10 billion) and significant barriers associated with constructing an LNG export terminal and associated transport and processing facilities. In addition to the terminal facility, pipelines and other infrastructure must also be financed and constructed. For example, the Golden Pass LNG export facility is expected to cost $10 billion, ten times the cost of the import terminal at the same location.[17] LNG export projects must go through a rigorous and costly application and permitting process with federal and state authorities before receiving approval. Project developers also need to arrange numerous contracts and off-take arrangements in order to secure financing.

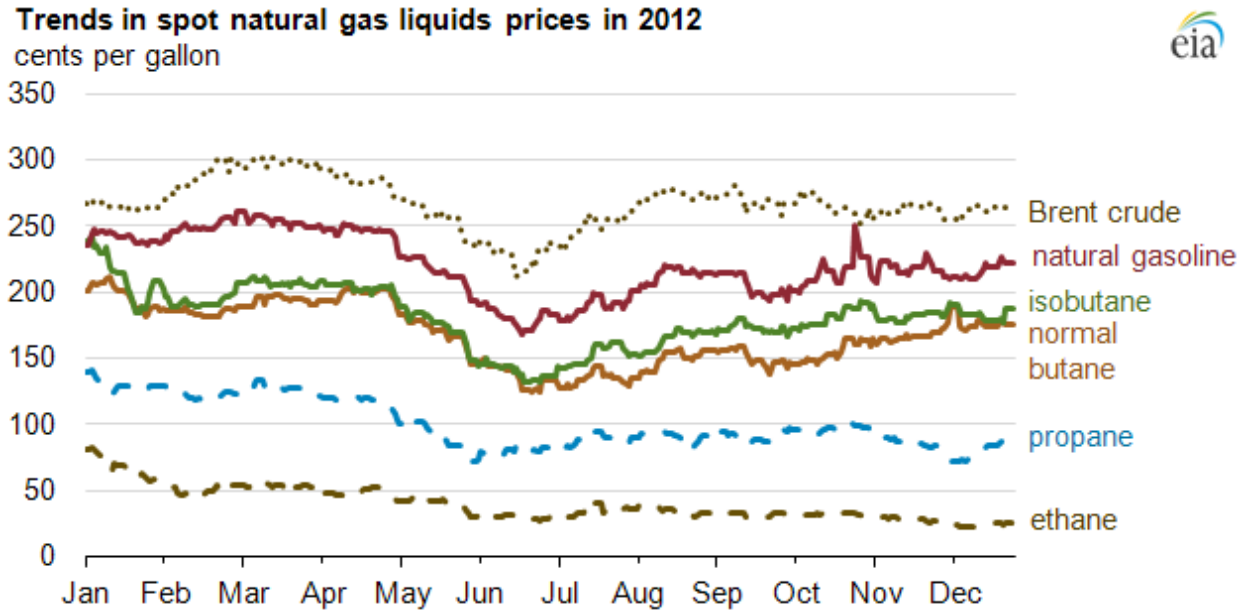
[13] Kenneth B. Medlock III, PH.D. U.S. LNG Exports: Truth and Consequence. August 10, 2012.
[14] Kenneth B. Medlock III, PH.D. U.S. LNG Exports: Truth and Consequence. August 10, 2012.
[15] http://www.eia.gov/oiaf/aeo/conf/pdf/martin.pdf
[16] Ibid.
[17] Golden Pass Products LLC. Application for Long-term Authorization to Export Liquefied Natural Gas with the Department of Energy, Office of Fossil Energy. October 25, 2012.

International market dynamics should be allowed to balance the market, including with respect to the success of competing export projects. DOE's decision process for granting export approvals should not assume that future export volumes will simply equal the total number of LNG export applications, which is almost certain to overstate the amount of export capacity that is ultimately developed. The financial exposure from preparing and submitting a DOE export application is low and, therefore, the number of applications in the queue is not a reliable indicator of actual construction activity.[18]

4. Demand and Supply are Linked: Gas Demand Helps Drive Natural Gas Liquid Supply.

Several commenters refer to a recent "manufacturing renaissance" in the United States fuelled by low natural gas prices.[19] One of the key drivers of this economic activity has been the increased production of natural gas liquids (NGL)—ethane, propane, normal butane, isobutane, and natural gasoline. Ethane, in particular, is an important feedstock for the plastics and petrochemical industries. Due to recent high natural gas production activity, supplies of natural gas liquids have driven prices down (as seen in the chart below), which helps fuel the "manufacturing renaissance." For example, propane's average 2012 spot price was almost 48% below its 2011 average price, due to increased domestic production.

[18] The fee for filing an initial LNG export application with DOE is only $50.
[19] See, for example, the comments of Dow Chemical Company.



Permitting LNG exports will drive demand for U.S.-produced dry natural gas, and drive continued investment in overall domestic natural gas production. This will stimulate further NGL production and help to preserve the low prices that have benefited the domestic chemical, fertilizer, and plastics industries.

5. LNG Exports are Highly Unlikely to Increase Price Volatility.

Several commenters noted that natural gas prices have exhibited a prior tendency toward high volatility, citing experience from the previous decade where spot prices fluctuated as low as $2 and as high as $14 per mmbtu.[20] One commenter notes, "[t]he NERA model by itself is incapable of assessing what would most probably be a spike in price volatility as a result of lifting constraints on LNG exports."[21] Another writes, "On the other hand, approval of several terminals and shipments starting all at the same time could shock the domestic market and prices could spike for all U.S. consumers…As new natural gas-fired power generation plants, new industrial facility demand and export terminal demand are all dependent upon the same infrastructure, prices will rise and accelerate the potential for

[20] For example, see comments from Dow Chemical Company and Industrial Energy Consumers of America (IECA).
[21] Comments of the Dow Chemical Company before the United States Department of Energy, January 24, 2013.

price spikes."[22] However, the root causes of past price volatility have been mitigated by continued investments throughout the natural gas supply chain.

Natural gas price volatility can be defined as "sustained, unpredictable price movements" that cause uncertainty for both users and producers of natural gas.[23] Expected seasonal price fluctuations (e.g., due to greater demand for heating) do not constitute "volatility" in the strictest sense of the word, but large unforeseen price shocks do.

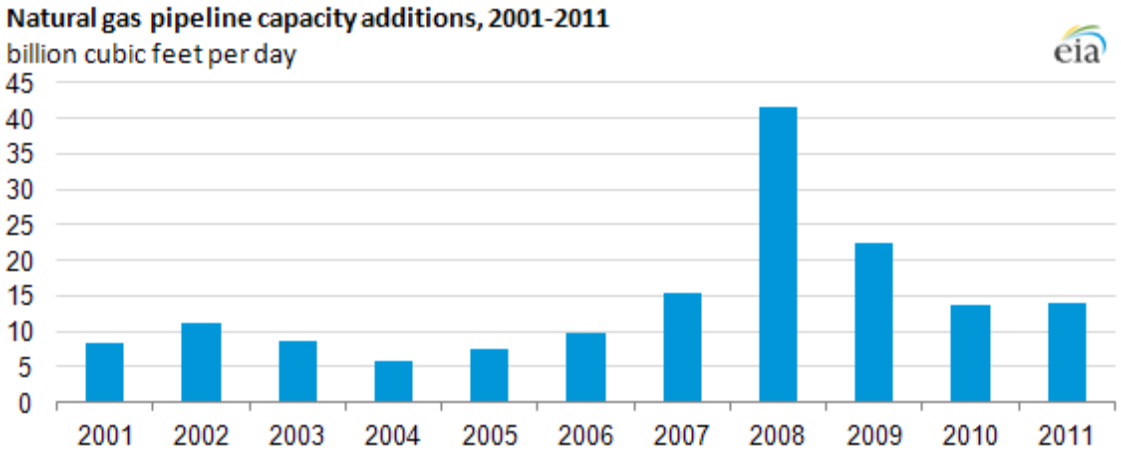
Since 2000, the U.S. has experienced three noteworthy periods of price volatility: (1) the California energy crisis in 2000-2001; (2) the hurricanes of 2005; and (3) the price spike in 2008. Each of these events provided a different lesson in potential causes of price volatility: deliverability issues, supply shocks, and erratic market behavior.

- In the case of the California energy crisis, a steep rise in demand for natural gas-fired power generation was followed by erratic trading behavior and asymmetric management of physical infrastructure. This behavior significantly hindered "deliverability" – the ability of suppliers to meet natural gas demand.
- In the second period of price volatility, extreme weather conditions knocked out production and transportation facilities and caused a sudden, prolonged loss of 6 billion cubic feet per day of natural gas production from the Gulf of Mexico.
- During the third period, a natural gas price rise followed general global commodity price inflation. Prices rose steeply in everything from oil to wheat, and then returned back to pre-inflation levels.[24]

Outside of these three anomalous events, prices in the period from 2000 to 2010 were relatively stable, and there is nothing to suggest that LNG exports would cause a market disruption similar to these episodes. First, deliverability of gas throughout the U.S. has improved markedly since 2000, with over 150 billion cubic feet per day (bcf/d) of pipeline capacity added from 2001 to 2011. The industry has continued to invest in additional

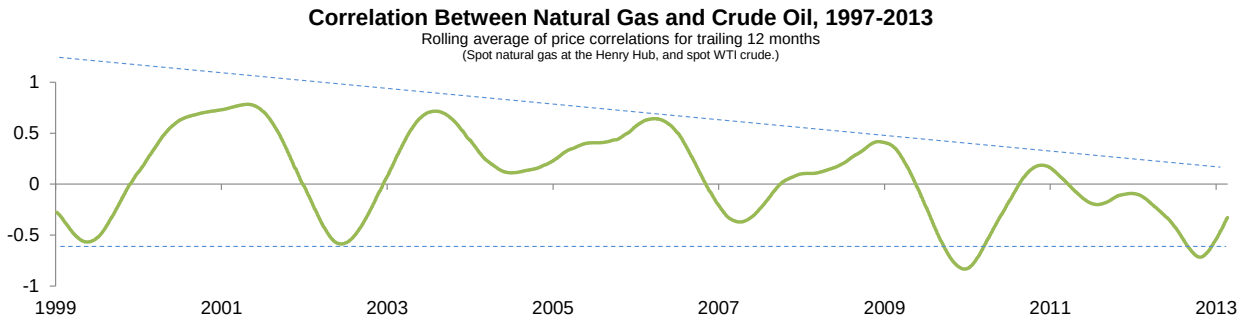
[22] Comments from the Industrial Energy Consumers of America, January 24, 2013.
[23] Price Instability in the U.S. Natural Gas Industry Historical Perspective and Overview, July 15, 2010. Prepared for The Task Force on Natural Gas Market Stability, Rick Smead, Navigant Consulting.
[24] Ibid. The Smead report contains a lengthy discussion of the history of price volatility.

pipeline capacity, adding 2,400 miles in 2011 alone. A robust pipeline infrastructure and expanded storage capacity ensures that natural gas is available when and where it is needed, and helps avert price spikes caused by deliverability problems.



The price volatility caused by Hurricane Katrina is indicative of a supply problem that bears no resemblance to the supply impact of potential LNG exports. Long lead times for LNG terminal construction will give the market several years to anticipate the demand increase. With a hurricane, the market has only days to react. Note, too, that increasing onshore unconventional gas production has diversified our gas supply toward multiple onshore areas and noticeably reduced hurricane-related gas price volatility.

The market's reaction to the global commodity price bubble was explained in part by an expectation on the part of commodity traders that natural gas and oil prices were inextricably linked. But in the ensuing years, natural gas and oil prices in the U.S. have definitively decoupled from one another. Analysts are further suggesting that LNG prices, which have been historically indexed to oil prices, will be increasingly priced as an independent commodity. The chart below shows that natural gas prices have become less correlated with the price of oil over the past 15 years, and recently this correlation has been inverted (natural gas prices move down when oil moves up, and vice versa). In today's market, a dramatic and sharp increase in the price of oil would not have the same impact on the price of natural gas as it would have historically.



On top of the changes to deliverability and market pricing, production from shale formations, distributed throughout the U.S., has fundamentally changed the industry's ability to respond to price signals. In conventional production, higher prices drive producers to increase exploration, but the link and timing to actual production is lagged and imperfect. Production from shale formations reduces exploration risk significantly, and allows producers to increase production far more responsively. Given the size of the technically recoverable resources in the U.S., combined with the fact that there is little exploration involved in finding the gas, producers will be able to respond quickly to market signals in order to meet increasing demand. With the ability to react efficiently to price signals, production volumes should significantly reduce the risk of sustained, unpredictable price movements. This is a major benefit of the size of the technically recoverable total natural gas resource base, which has increased from less than 1,500 Tcf in 2000 to nearly 2,500 Tcf in 2011, by EIA's own estimates.

ANGA rejects claims that allowing the development of LNG export terminals will increase natural gas price volatility. None of the root causes of volatility would be exacerbated by the addition of LNG export capacity. Moreover, natural gas producers and pipeline companies have invested heavily to enhance gas deliverability and mitigate supply shocks. Natural gas prices have decoupled from volatile oil prices. The addition of LNG export capacity would constitute a predictable amount of new demand, and the market would have ample time to anticipate and adjust to meet its requirements. It takes at least four years for an LNG export terminal to proceed from ground-breaking to completion. So a project that breaks ground in 2013 will not require natural gas supplies until 2017 at the

earliest.[25] Over the longer term, producers will have ample lead time to increase production to meet increased demand at LNG terminals.

6. Environmental Concerns are Being Appropriately Addressed.

Some opponents of LNG exports criticize the NERA report for not addressing certain environmental impacts. More specifically, some commenters assert that DOE should review indirect environmental impacts of induced shale gas development, in addition to direct impacts of LNG export terminals. However, these assertions have already been considered and rejected as inconsistent with applicable law in past DOE and Federal Energy Regulatory Commission (FERC) orders.[26]

a. Alleged indirect environmental impacts from shale development do not meet the standard for consideration under NEPA.

The robust environmental regulatory framework in the United States extends to the process of permitting LNG export terminals. DOE is responsible for regulating natural gas imports and exports under Section 3 of the Natural Gas Act (NGA). The Secretary of Energy has, in turn, delegated the NGA Section 3 authority for siting, construction, and operation of LNG import and export facilities to FERC. Under this framework, FERC is responsible for leading environmental analyses of proposed LNG export terminals and DOE is responsible for independently reviewing FERC's environmental findings.

DOE and FERC have appropriately addressed the environmental concerns raised by commenters through the now completed application process for Sabine Pass Liquefaction, LLC. In August 2012, DOE granted Sabine Pass the long-term authorization to export LNG to Non-Free Trade Agreement Nations through Order 2961-A. The Docket for Sabine Pass (No. 10-111-LNG) shows a thorough examination of these environmental questions within the requirements of the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ)

[25] "U.S. LNG Exports – an International Perspective," James Jensen, Jensen Associates, presentation to the Washington LNG Forum, January 29, 2013.
[26] See, for example, FERC dockets 10-111-LNG and CP11-72-000, and FERC Order No. 2961-A.

implementing regulations and guidance. The extensive environmental review process is detailed in FERC's approval to site, construct, and operate the LNG Sabine Pass export terminal (Docket No. CP11-72-000). All current and future LNG export proposals will be subject to a similar type of analysis, ensuring that all projects receive an extensive environmental review.

FERC's review of the Sabine Pass proposal explicitly discussed a broad range of potential environmental concerns including direct environmental impacts and potential cumulative environmental impacts Some opponents of LNG exports have focused on cumulative indirect effects and have argued that FERC should also have evaluated potential environmental impacts allegedly arising from shale gas development that those commenters claim would be induced by the approval of the Sabine Pass facility. However, FERC directly addressed this question in the Sabine Pass approval.

In its final order, FERC appropriately concluded that NEPA does not require evaluation of potential impacts from induced shale gas development. CEQ guidance confirms this. Although NEPA analysis can extend to some indirect effects, CEQ has established reasonable limits on this type of analysis through its eight general principles governing cumulative effects analyses.[27] FERC based its finding on the fourth principle which states "it is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful." Based on this CEQ principle, FERC rejects the assertion that assessments of LNG export terminals should extend to natural gas production.

FERC finds that "impacts which may result from additional shale gas development are not 'reasonably foreseeable' as defined by the CEQ regulations. Nor is such additional development, or any correlative potential impacts, an 'effect' of the project, as contemplated by the CEQ regulations, for purposes of a cumulative impact analysis." The Office of Fossil Energy of the Department of Energy (DOE/FE) supported FERC's findings in its approval of Sabine Pass (Order 2961-A), "DOE/FE accepts and adopts the

[27] *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997)

Commission's determination that induced shale gas production is not a reasonably foreseeable effect for purposes of NEPA analysis, for the reasons given by the Commission."

Any alleged impacts beyond those identified and analyzed by DOE and FERC are indeed too remote and speculative, and beyond the reach of NEPA's mandate. The DOE and FERC approach and findings in the Sabine Pass review comport fully with applicable law in unambiguously rejecting some commenters' assertions that impacts purportedly associated with induced shale gas development should be analyzed in evaluating environmental impacts of future LNG exports. ANGA strongly agrees with DOE's and FERC's conclusions on this issue.

b. **The safe and responsible development of shale gas resources is well-managed under existing state and federal regulation.**

The U.S. natural gas industry is subject to significant environmental oversight through existing federal, state, and local regulations. As the National Petroleum Council's recent study entitled "Prudent Development" points out, realizing the benefits of oil and natural gas requires environmentally responsible development. A complex regulatory framework governs operational requirements, drilling practices, land use, water use, and other environmental safeguards. These involve many agencies of the federal, state, and even local governments and are generally effective.[28] With the expansion of U.S. natural gas production, EPA, other government agencies, local communities, and many other stakeholders are also closely examining potential impacts of natural gas operations. ANGA is committed to working constructively with these stakeholder groups to ensure safe and environmentally-responsible development of this abundant U.S. resource.

c. **There are direct environmental benefits associated with increased natural gas use.**

[28] National Petroleum Council, Executive Summary, pp. 20 ff.

The environmental benefits of increased natural gas use in the power sector are well documented. Natural gas is a clean-burning fuel that can contribute to significant reductions in air pollution emissions and other environmental impacts. Natural gas has broad emissions benefits relative to the dominant energy source for power generation with 80 percent fewer NO_X emissions and virtually no sulfur dioxide, mercury, or particulate pollution. The switch to natural gas is also helping to drive down U.S. GHG emissions. In 2012, U.S. electric sector GHG emissions fell 15 percent compared to 2005 according to the most recent U.S. EIA data.[29]

The increasing role of natural gas in the power sector could also provide water benefits. A study by the Belfer Center for Science and International Affairs in Harvard's Kennedy School of Government highlights that the water consumption for producing shale gas appears to be lower than processes for other fossil fuels and NGCC plants require less water to run than other thermoelectric technologies.[30] The authors of this study find that using more natural gas for power generation could lead to an overall reduction in water consumption. These environmental benefits of natural gas are also likely to be realized outside of the United States as other countries move to more natural gas in the electric sector.

7. Conclusion

ANGA appreciates this opportunity to provide additional comment to the Department of Energy. We continue to support the conclusion of the NERA report -- that exporting natural gas, via LNG technology, will generate a net economic benefit to the U.S. economy.

Reliable energy will be needed to meet the needs of a growing domestic and global economy. We need cleaner energy and we need abundant and domestic energy to grow our economy and create jobs here at home. North America's abundant supplies of natural

[29] U.S. EIA January 2013 Monthly Energy Review. U.S. Electric Sector GHG Emissions: 2005 Jan. – Oct. = 2,024 Million Metric Tons (MMT) of CO_2, 2012 Jan. – Oct. 2012 = 1,716 MMT CO_2.
[30] Mielke, E., Anadon, L. D., Narayanamurti, V., (2010). "Water Consumption of Energy Resource Extractions, Processing, and Conversion," Energy Technology Innovation Policy Discussion Paper Series, Harvard Kennedy School Belfer Center for Science and International Affairs, Cambridge, Massachusetts.

gas will be a big part of the supply picture. Our natural gas resource is vast. The shale gas resource has revolutionized the scale of future energy supply in this country.
Because of its abundant supply and world-class capability and infrastructure, the U.S. now has new opportunities to capture significant benefits by both expanding domestic markets and expanding into international markets for natural gas. Economies of scale realized through increased natural gas production and related job creation, revenue, and improved balance of payments from export trade will all accrue from free, open, and transparent markets. Limits on trade are fundamentally contrary to basic economic principles, as well as longstanding U.S. efforts to expand international trade. Such limits would deny the U.S. opportunities to substantially improve economic growth while creating new jobs and government revenues through new energy resource development.

As the DOE considers and evaluates comments on the 2012 LNG Export Study, ANGA encourages the DOE to consider the full range of benefits which will accrue to the U.S. Those benefits include the enhanced energy security and economic prosperity that will be achieved by supporting the open and free trade of LNG, as well as the environmental benefits that accrue from using clean burning natural gas both domestically and abroad.

Should you have any questions about these comments, please do not hesitate to contact me at 202-789-2642.

Sincerely,

Amy Farrell
Vice President, Regulatory Affairs
America's Natural Gas Alliance