



Industrial Energy Consumers of America

The Voice of the Industrial Energy Consumers

1776 K Street, NW, Suite 720 • Washington, D.C. 20006
Telephone (202) 223-1420 • www.ieca-us.org

February 12, 2016

U.S. Department of Energy (FE-34)
Office of Regulation and International Engagement
Office of Fossil Energy
P.O. Box 44375
Washington, DC 20026-4375

Federal Register Number: 2015-32590, "2015 LNG Export Study"

Re: 2015 LNG Export Study

On behalf of the Industrial Energy Consumers of America (IECA), we thank you for the opportunity to provide comments on the study, "The Macroeconomic Impacts of Increasing U.S. LNG Exports" which considers the economic implications of increasing LNG exports from 12 to 20 billion standard cubic feet per day (Bcf/d). The U.S. Department of Energy (DOE) has already given final approval on twelve long-term LNG export applications to non-free trade agreement countries, totaling 10.008 Bcf/d.

The study is important because "DOE may use the 2014 EIA LNG Export Study and the 2015 LNG Export Study to inform its decisions"¹ in 29 LNG export applications seeking approval to ship to non-free trade countries. Non-free trade countries represent the majority of current demand for LNG.

DOE states: "In deciding whether to grant a non-FTA export application, it considers in its decision-making the cumulative impacts of the total volume of all final non-FTA authorizations. DOE has further stated that it will assess the cumulative impacts of each succeeding request for export authorization on the public interest with due regard to the effect on domestic natural gas supply and demand fundamentals."

"A comprehensive set of scenarios was prepared to understand the economic impact of higher U.S. LNG exports under a range of circumstances for domestic and international gas markets. This scenario approach was chosen to enable conclusions that are independent of any particular set of starting conditions for the U.S. or international natural gas markets, and to highlight the impact of increasing U.S. LNG exports under alternative domestic and international conditions. The authors considered sets of circumstances that would result in different international demand pull for U.S. sourced LNG. The variants considered were international conditions sufficient to support 12 Bcf/d and 20 Bcf/d of U.S. LNG exports."

¹ "The Macroeconomic Impacts of Increasing U.S. LNG Exports," U.S. Department of Energy, October 29, 2015, http://energy.gov/sites/prod/files/2015/12/f27/20151113_macro_impact_of_lng_exports_0.pdf.

Comments must be limited to methodology, results, and conclusions of these studies on the factors evaluated. These factors include the potential impact of LNG exports on domestic energy consumption, production, and prices; the macroeconomic factors identified in the two studies, including Gross Domestic Product, consumption, U.S. economic sector analysis, and U.S. export feasibility analysis; and any other factors included in the analysis.”

The DOE Office of Fossil Energy (FE) has received 45 applications requesting long-term authorization to export domestically produced, lower-48 natural gas as LNG to non-free trade agreement countries in a volume totaling the equivalent of 45.1 Bcf/d of natural gas. Of these, DOE/FE has granted final authorization for ten applications totaling 9.99 Bcf/d. Currently, the Federal Energy Regulatory Commission (FERC) is reviewing proposed, lower-48, large-scale LNG export facilities totaling 24.325 Bcf/d under the requirements of the National Environmental Policy Act (NEPA), and has granted authorization to construct six other terminals totaling 10.62 Bcf/d.

Industrial Energy Consumers of America (IECA)

IECA is a nonpartisan association of energy-intensive trade-exposed manufacturing companies, commonly referred to as EITE industries, with over \$1.0 trillion in annual sales, over 2,900 facilities nationwide, and with more than 1.4 million employees. IECA membership represents a diverse set of industries including: chemical, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, insulation, glass, industrial gases, pharmaceutical, building products, automotive, brewing, independent oil refining, and cement.

EITE industries use 75 percent of the natural gas and 73 percent of electricity consumed by the manufacturing sector, and would be negatively impacted if natural gas prices increase as a result of exporting LNG. EITE industries account for over 40 percent of all manufacturing jobs.

Sound public policy decision-making requires transparency and economic studies that contain cumulative cost analysis and risk assessment.

It is of great concern to IECA and its member companies that the study does not examine “cumulative” costs of LNG exports. The DOE says that this study will be used to inform decision-making on approval or the disapproval of pending LNG applications to ship to countries without a free trade agreement. While the DOE says it will evaluate the “cumulative” impacts, in fact, this study does not. Instead, the study examines the cost impacts of exports from 12 Bcf/d to 20 Bcf/d and does not include the cost impacts of LNG exports on the U.S. from 0 to 12 Bcf/d. As a result, this study is flawed and should not be used to inform decision-making.

LNG exports significantly increase risk to the public, and the economy long-term. Under no scenario do LNG exports reduce risks to the public. Under every scenario, prices of natural gas increase, which also means that electricity prices do as well. The relative risk to the U.S. consumer with LNG exports of 0 to 11 Bcf/d is substantially less than the risks of LNG exports of 12 to 20 Bcf/d. The study does not evaluate risk, a serious flaw given that the approval of additional LNG export terminals must not conflict with the public interest.

If the last 18 months have taught us anything, it is that the oil and gas market is very volatile and events that no one forecasted – can and did occur. So when the DOE relies on studies for a

period out to 2040 for decision-making, it must do so with enormous caution. And we must be reminded that consumers do not have an alternative to natural gas.

From a natural gas producer's point of view, there are two important reasons they desire to increase LNG exports. First, LNG exports allow natural gas producers to sell increased volumes of natural gas overseas. However, by doing so, and because natural gas is not renewable, LNG exports will increase the price of U.S. natural gas. And the second benefit is even more important to them because the U.S. is the largest natural gas market in the world and increasing U.S. prices up is the top priority.

Today, and historically, the U.S. natural gas price is determined by domestic supply and demand. This study confirms that as LNG exports occur, international demand will dictate U.S. prices. Under the study scenarios, U.S. prices will reach parity with international prices. Today, we do have a global economic advantage and we will lose this advantage due to excessive LNG exports.

From an EITE industry perspective, excessive LNG exports threaten trillions of dollars of existing capital investment made in the U.S. And, the manufacturing sector employs over 12 million direct employees that also become threatened by excessive LNG exports. The entire oil and gas industry employment is but a fraction of this amount. The study says that the maximum potential annual job creation by increasing LNG exports to 20 Bcf/d is only 4.5 percent of this 12 million person workforce.

The DOE has already approved a significant amount of LNG exports for shipment to countries that do not have a free trade agreement. It is sound public policy decision-making for DOE to not approve additional LNG export applications at present. It is less risky for the public and the U.S. consumer to let the approved LNG terminals come online. Then wait to see if the natural gas producers can not only increase production to meet the additional demand but "sustain" those high levels of production over a longer time horizon. Carefully managing risk in behalf of the economy is an appropriate public policy stance. And, the DOE should take the position of being "risk adverse."

DOE should only approve more applications once the gas industry has proven that it can sustain high levels of production without significant price increases to the U.S.

COMMENTS ON THE STUDY FINDINGS

The study "findings" understate the negative impact to the U.S. economy and the energy-intensive trade-exposed industries.

Study Finding #1: Rising LNG exports are associated with a net increase in domestic natural gas production. The study finds that the majority of the increase in LNG exports is accommodated by expanded domestic production rather than reductions in domestic demand.

- IECA Response: The finding is not accurate because the study does not include the cumulative cost impact of increasing LNG exports from 0 to 12 Bcf/d.

The study understates the volume of domestic demand reduction. As low cost shale gas consumption is accelerated by LNG exports, prices will rise and there will be significant demand destruction by EITE industries. Tens of thousands of manufacturing facilities were closed and millions of jobs lost when prices rose from \$3.68/thousand cubic feet in 2000 to \$7.97/thousand cubic feet in 2008. While this study provides theoretical results, what happened from 2000 to 2008 is real. The study has failed to properly evaluate the price sensitivity to EITE industries.

Study Finding #2: As exports increase, the spread between U.S. domestic prices and international benchmarks narrows. In every case, greater LNG exports raise domestic prices and lower prices internationally. The majority of the price movement (in absolute terms) occurs in Asia.

- IECA Response: This is an accurate finding. However, the spread is much greater than the study indicates because the study does not include the cost impact of 0 to 12 Bcf/d demand.

At the 12 to 20 Bcf/d export level, the study says U.S. and global prices reach parity, which means the U.S. loses its competitive advantage. At this point, we have shipped our global competitive advantage offshore.

The combined impact of LNG exports reduces the costs of natural gas to our global competitors and simultaneously increases the domestic costs of natural gas and electricity, whereby EITE industries are significantly and negatively impacted. The study failed to calculate the “relative competitive impact” by only looking at the impact of rising prices domestically, not including the lowering of prices to our Asian competitors. The study also failed to evaluate the relative cost impact to electricity prices from higher natural gas prices. Steel, iron ore, and aluminum industries are significant consumers of both natural gas and electricity.

Study Finding #3: The overall macroeconomic impacts of higher LNG exports are marginally positive, a result that is robust to alternative assumptions for the U.S. natural gas market. With external demand for U.S. LNG exports at 20 Bcf/d, the impact of increasing exports from 12 Bcf/d is between 0.03 and 0.07 percent of gross domestic product (GDP) over the period of 2026-2040 or \$7-\$20 billion USD annually in today’s prices.

- IECA Response: The finding is not accurate because the study does not include the cumulative cost impact of increasing LNG exports from 0 to 12 Bcf/d. As the U.S. accelerates its consumption of low-cost shale natural gas as illustrated in Figure B7, domestic prices rise significantly creating great losses to GDP in U.S. The model uses long-term historical economic relationships and does not account for special circumstances that can have great changes to, for example, capital investment. The case in point is the hundreds of billions of dollars invested by EITE industries due to the long-term promise of low-cost shale gas. Without large LNG exports and the resulting higher prices, these investments would continue. The model does not account for the lost capital investment opportunity that would have occurred had it not been for LNG exports. Nor does the model account for the significant jobs that would have occurred had it not been for higher natural gas prices.

Because the study has failed to consider “relative competitiveness”, that is, the combined impact of lower prices to our global competitors and higher prices domestically, the overall macroeconomics results are overstated. The study economics do not accurately reflect the results of accelerated consumption of low-cost shale natural gas as illustrated in Figure B7.

Even without considering the accelerated consumption of low-cost natural gas that will drive up prices; the study economic benefits are so small over the time frame that the results are within calculation error. In other words, there is an equally high probability that there are negative economic benefits of exporting under these scenarios. Table C2 in the study shows that ALL scenarios from 2015 to 2025 show “negative” GDP. It is only when you look to 2040 that a 0.1 percent increase in GDP is achieved.

Given the global uncertainties the world is experiencing today, and the time frame to 2040, it would be ludicrous for public policy decisions to support LNG export volumes of 12 to 20 Bcf/d, given the meager positive economic benefits which could go negative in a quickly.

Study Finding #4: An increase in LNG exports from the U.S. will generate small declines in output at the margin for some energy-intensive, trade-exposed industries. The sectors that appear most exposed are cement, concrete, and glass but the estimated impact on sector output is very small compared to expected sector growth to 2040.

- IECA Response: The finding is not accurate because the study does not include the cumulative cost impact of increasing LNG exports from 0 to 12 Bcf/d. The study’s analysis of EITE industries does not include the “relative” cost impact. Specifically, the study only considered the absolute cost changes to the price of natural gas on EITE competitiveness and did not include the “reduction” of costs to our global competitors.

All EITE industries’ profitability and relative competitiveness will be greatly impacted by higher natural gas and electricity prices. According to Figure B7, by 2040, LNG exports between 12 to 20 Bcf/d consumes all low-cost natural gas shale up to \$15-20 per mcf.

Study Finding #5: Negative impacts in energy-intensive sectors are offset by positive impacts elsewhere. Other industries benefit from increasing U.S. LNG exports, especially those that supply the natural gas sector or benefit from the capex needed to increase production. This includes some energy-intensive sectors and helps offset some of the impact of higher energy prices.

- IECA Response: This finding is wholly inaccurate because the study does not include the relative cost impact to EITE industries, nor does the study include the cost impacts of 0 to 12 Bcf/d LNG exports.

Secondly, the conclusion that energy-intensive industries benefit from increased natural gas production is theoretical. For example, there are several reports funded by the oil and gas industry that have calculated, for example, how much material their industry consumes thereby providing an estimate of demand, that includes EITE materials. None of these reports have examined how much of those materials were actually produced in the U.S. The DOE study is no different. For example, steel would be the largest beneficiary of the EITE

industries from natural gas development. In fact, there has been a relatively insignificant increase in shipments of U.S. produced steel to the gas industry because they have chosen to buy the steel from foreign competitors. There are numerous trade violation cases pending in which countries are dumping steel here in the U.S. below their costs. China is a good example. The proposed XL Pipeline is a case in point also because none of the U.S. portion of the pipeline would have been made with U.S. produced steel.

We agree with comments on page 64 that state, "higher gas prices dampen domestic [natural gas] consumption and erode U.S. [manufacturing] export competitiveness." Page 81 states, "As in the 20 Bcf/d export cases, the energy-intensive sectors generally underperform other downstream sectors (see figure 36) due to the impacts of higher energy prices."

IECA COMMENTS

- 1. Figure B7 of the study, "Shale Gas Breakeven Curves for North America by Country" illustrates that LNG exports of 12 or 20 Bcf/d, combined with net pipeline exports and domestic demand, greatly accelerate consumption of all low-cost natural gas, which would drive up natural gas and electricity prices much higher than this study indicates, threatening EITE competitiveness and the U.S. economy.**

Natural gas is not renewable. Once we consume U.S. low-cost natural gas, it is gone forever. Figure B7 from the study, illustrated below, shows the breakeven cost for shale natural gas. The left side shows the breakeven cost. The bottom shows the volume of available resources in Tcf.

Considering the volume of shale natural gas displayed in Figure B7 and the breakeven costs, exporting 12 Bcf/d of gas, combined with EIA's forecasted net pipeline exports and domestic demand, by 2040, only 25 years away, would consume up to 814 Tcf of natural gas (see Figure A). This amount, according to Figure B7 would consume all low-cost natural gas up to \$9.00 per mcf. Today's Henry Hub price is around \$2.60 per mcf. These high prices combined with LNG exports reducing the cost of natural gas for our global competitors would have devastating impacts to EITE industries.

If LNG exports reach 20 Bcf/d, combined with EIA's forecasted net pipeline exports and domestic demand, by 2040, would consume up to 875 Tcf of natural gas (see Figure B). This amount, according to Figure B7 would consume all low-cost gas up to \$15-20 per mcf.

FIGURE B7: SHALE BREAK-EVEN CURVES FOR NORTH AMERICA BY COUNTRY

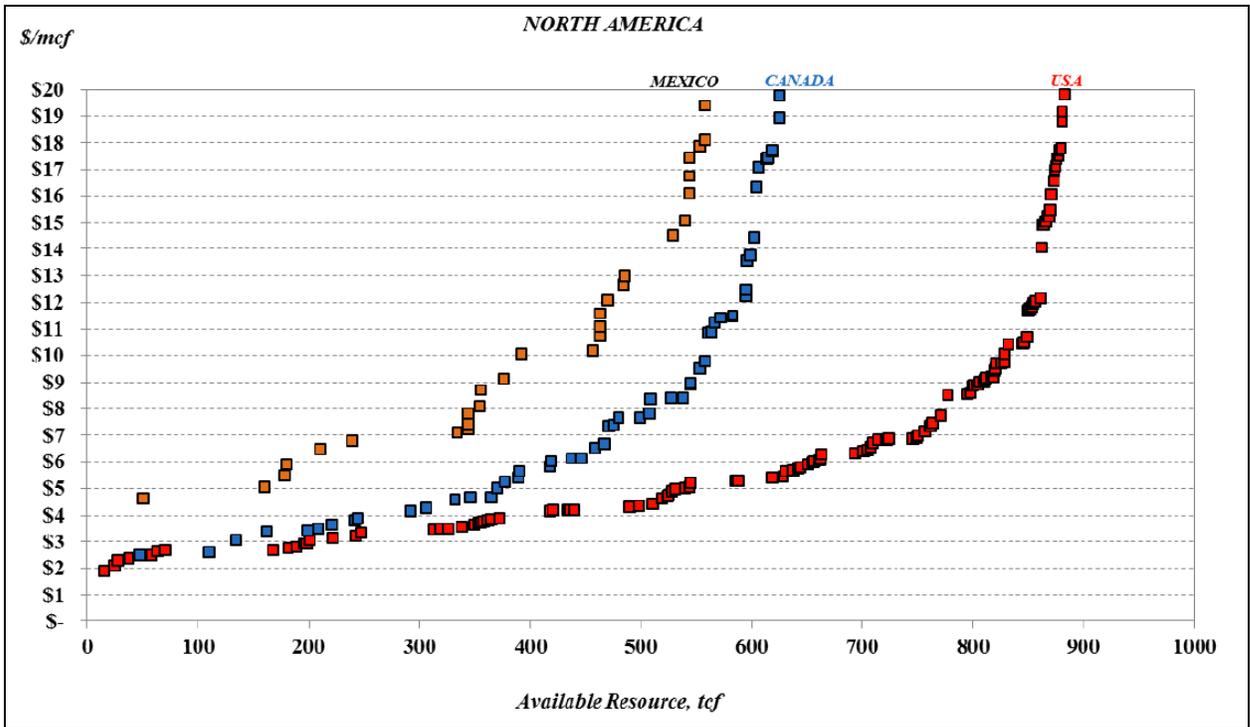


FIGURE A: LNG DEMAND AT 12 BCF/D (Trillion cubic feet)

	2016	2020	2025	2030	2035	2040	Cumulative Total (2016-2040)
U.S. Natural Gas Demand, (EIA)	27.04	26.14	26.88	28.08	28.82	29.70	691.84
Net Pipeline Exports (EIA)	-0.58	0.48	1.01	1.52	1.90	2.33	30.32
LNG Demand of 4.38 Tcf/year or 12 Bcf/day		4.38	4.38	4.38	4.38	4.38	91.98
Total Overall Demand	26.46	31.00	32.27	33.98	35.10	36.41	814.14

FIGURE B: LNG DEMAND AT 20 BCF/D (Trillion cubic feet)

	2016	2020	2025	2030	2035	2040	Cumulative Total (2016-2040)
U.S. Natural Gas Demand (EIA)	27.04	26.14	26.88	28.08	28.82	29.70	691.84
Net Pipeline Exports (EIA)	-0.58	0.48	1.01	1.52	1.90	2.33	30.32
LNG Demand of 7.30 Tcf/year or 20 Bcf/day		7.30	7.30	7.30	7.30	7.30	153.30
Total Overall Demand	26.46	33.92	35.19	36.90	38.02	39.33	875.46

2. The study understates natural gas price impacts of LNG exports.

Page D-1 of the study provides the reference case Henry Hub natural gas prices that are displayed below in Figure C. Given the above information, the study's assumptions and cost impacts to natural gas prices are greatly understated.

FIGURE C: NATURAL GAS PRICES (2010\$/mmBtu)

	2015	2020	2025	2030	2035	2040
Henry Hub	\$3.28	\$4.62	\$5.30	\$5.79	\$6.66	\$7.42

3. Statement of Work: “Task 1: Scenario Analysis of International Demand for U.S. LNG Exports and Market Conditions of the Global Natural Gas Market” does not address realities and the wide uncertainties associated with global production and pricing.

This snapshot in time analysis does not reflect the global uncertainties and diversity of potential outcomes of this information going forward. The current global energy market turmoil is a good example of the tremendous uncertainties of the future. LNG export application decisions made by the DOE, using the output of this analysis, creates significant risk to domestic consumers.

It is impossible to get the economics of global production or consumption remotely correct, either now or long-term because they can change ever so quickly and as we have witnessed with the fall of global crude oil prices over the last 18 months, a price decline that no one forecasted. U.S. mining and exploration investment has declined 35% in 2015, the second largest year-over-year decline since the U.S. Bureau of Economic Analysis (BEA) began reporting the series in 1948. Most mining and exploration investment reflects petroleum exploration and development, but the category also includes natural gas, coal, and other minerals.

The scenarios and analysis fail to address, or even acknowledge the fact that countries or state-owned enterprises (SOEs), not multi-national western companies control most of the resources globally. Country SOEs do not always abide by “economics” to make their decisions to produce or not produce, which is the basis for the study. Most producing country SOEs will produce when prices are below costs just to generate needed income to fund their government.

Also, not addressed is that the crude oil and LNG complex are not “free” markets which also add complexity to forecasted global production, costs, and prices. When demand picks up globally, and, as they have in the past, country SOEs will likely collude to increase the price of crude oil and LNG. Country cartels such as OPEC, and the one contemplated for LNG, are a reality and can reduce supply to increase prices, as they have done in the past. The study scenarios do not reflect these elements which all portend much higher inaccuracy of the projections.

4. Statement of Work: “Task 2: U.S. Macroeconomic Impact and Price Response Based on International Demand for U.S. LNG Exports” does not reflect cumulative LNG exports cost impacts.

According to the study, this section focuses on, “The price impacts of LNG exports should be incorporated, including a discussion of how domestic natural gas prices are determined and the potential for correlation between domestic and international natural gas prices.” The statement of work is flawed in that the analysis does not include the costs of LNG exports from 0 Bcf/d to 12 Bcf/d.

The analysis fails to consider the “relative competitive cost impact” to EITE industries of LNG exports. The study summary bullet point reads: “In every case, greater LNG exports raise domestic prices and lower prices internationally. The majority of the price movement (in absolute terms) occurs in Asia.” Page 17 of the report says that LNG exports increasing from 12

Bcf/d to 20 Bcf/d during 2026 and 2040, reduces prices in the Asian-Pacific market by 73 cents per million British thermal units, while increasing U.S. prices by 15 cents per million British thermal units – a combined net negative relative impact to competitiveness of 88 cents, or a 40% equivalent increase, as compared to current prices. A 40 percent impact to relative competitiveness is very significant and is not addressed in the cost impacts. IECA believes the increase to natural gas costs will be substantially higher than 15 cents.

Page 76 states, “The largest increase in [LNG] exports occurs in the HRR cases, and it is in these cases where we see the largest increase in Henry Hub (topping out at \$0.86 in the late 2030’s) and the largest decrease in JKM (approaching \$5.50 by 2040).” This means that our global competitors would see a decrease in price of \$5.50, while U.S. prices rise \$0.86 for a total relative negative competitive impact of \$6.36. This would represent a substantial negative impact to U.S. EITE competitiveness.

The analysis does not take into consideration existing energy subsidies (including subsidies for natural gas) provided by countries that U.S. EITE industries compete against. Several Asian countries subsidize natural gas to industrial companies, including China. China represents about 70 percent of the U.S. manufacturing trade deficit.

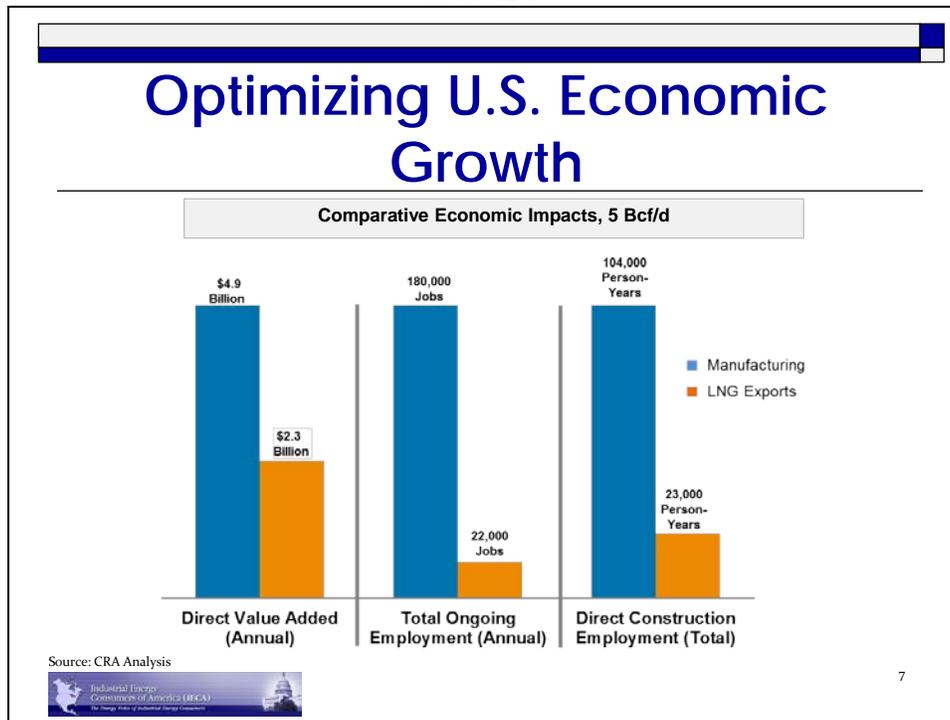
5. The study design is flawed because it does not focus on how the public interest is maximized using U.S. natural gas resources, a non-renewable energy source.

The study is narrowly designed to evaluate the potential for maximizing LNG exports versus maximizing public interest gains, such as maximizing job creation, capital investment, reducing the manufacturing trade deficit, and keeping natural gas costs low, which supports disposable income that spur personal spending, the largest driver to the U.S. economy. If it had, the results would have been entirely different. There would have been significant job creation and GDP growth.

If DOE did such a study it would make clear that the greatest opportunity for natural gas demand is in manufacturing where eight times more jobs would be created than exporting gas. Consuming natural gas in manufacturing versus exporting it increases GDP by two and also creates over four times the construction jobs. A Charles River Associates study, illustrated in Figure D, compares the benefits.

Another fatal flaw of the study is that it apparently assumes that EITE industries will continue on in a “business as usual” course as the LNG exports potentially rise to 20 Bcf/d. If that is the case, it is unrealistic. EITE companies are risk averse. They will think twice before making significant new capital investments that are dependent upon natural gas long-term. This study and previous studies which show relatively little impact to natural gas prices as LNG exports increase, are largely viewed as not credible by EITE companies.

FIGURE D



6. The study fails to assess risk to the public and to the economy.

LNG exports significantly increase risk to the public and the economy long-term. Under no scenario do LNG exports reduce risks to the public. Under every scenario, prices of natural gas increase, which also means electricity prices increase also. The relative risk to the U.S. consumer with LNG exports of 0 to 11 Bcf/d is substantially less than the risks of LNG exports of 12 to 20 Bcf/d. The study does not evaluate risk, a serious flaw given that the approval of additional LNG export terminals must not conflict with the public interest.

7. Questionable study demand assumptions were used that reduce the cost impact of increased LNG exports.

Figure D2 In the study illustrates the U.S. demand assumption from 2015 at 27.13 Tcf rising to only 31.67 in 2040, an insignificant increase of only 16.7 percent for the entire period of 25 years, or only 0.67 percent per year. This is arbitrarily low and has the impact of reducing the cost impact of increasing LNG exports.

8. The study does not cite a single EITE study – raising further questions about the quality of the study output.

It is of great concern that not one single study on the price sensitivity of EITE industries is cited in the study. On pages 84 and 85, 12 studies are cited as sources and 10 of them are studies authored by Kenneth Medlock, who is the coauthor of the study. This clearly implies that no research was completed to examine the impact of higher prices on EITE industries.

Again, thank you for the opportunity to comment on this study.

Sincerely,

Paul N. Cicio
President