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NATURAL GAS EXPORTS: ECONOMIC AND GEOPOLITICAL OPPORTUNITIES

HEARING

BEFORE THE

SUBCOMMITTEE ON TERRORISM, NONPROLIFERATION, AND TRADE

OF THE

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NATURAL GAS EXPORTS: ECONOMIC AND GEOPOLITICAL OPPORTUNITIES

THURSDAY, APRIL 25, 2013

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON TERRORISM, NONPROLIFERATION, AND TRADE,
COMMITTEE ON FOREIGN AFFAIRS,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:13 p.m. in room 2200, Rayburn House Office Building, Hon. Ted Poe (chairman of the subcommittee) presiding.

Mr. POE. The subcommittee will come to order. Without objection, all members may have 5 days to submit statements, questions, extraneous materials, for the record, subject to the length limitation in the rules.

Five years ago, companies were building terminals to import natural gas at the cost of billions of dollars because analysts agreed that the United States' economy was going to need natural gas from overseas. Today, that scenario has changed 180 percent. Import terminals lie dormant. The Department of Energy has 19 applications waiting to get permission to export natural gas. Thanks to breakthroughs, the United States' natural gas reserves have climbed 72 percent since 2000 and 49 percent since 2005. The amount of natural gas that is technically recoverable in the United States is 97 times greater than all of the natural gas we consumed in 2011. In plain terms, this means we have an abundance of natural gas that we are not using. It is just sitting there, and this is really not smart policy, or smart business.

A big reason why is the Department of Energy. The Department of Energy has not approved an application to export to a country we don't have a Free Trade Agreement with in 2 years. When the DOE says you can't export, that floods the domestic market with natural gas because producers have no place to sell it. Prices domestically have now dropped so low that it just isn't worth it for producers to even pull any more natural gas out of the ground.

So we have recoverable natural gas that is unused because the government refuses to let it be produced. Let me give you an example. There is one company that has a permit pending with the DOE for 2 years. If the DOE would give the green light, the company would immediately create 3,000 new construction jobs, 20,000 to 30,000 more jobs would also be created for exploration, drilling, and pipe laying. In all, the economy would see an infusion of $10 billion from the project alone. Jobs are important and it is impor-

tant that the government understand that we should move forward with jobs in this industry.

It is not just one project; there are others like this one project that can't get started. No matter what economic study someone looks at, even those commissioned by the DOE, the result of opening up our natural gas exports is an economic gain for the United States. Real income and the GDP will all rise. More exports would be a big gain for our business sector; 91 percent of firms in the oil and gas extraction industry have fewer than 20 employees. Many family-owned small businesses really can't wait for 2 years for the Department of Energy to approve a permit. They really don't have that kind of flexibility or money. So the longer the process takes, the harder it is on mom-and-pop companies to survive.

In Europe, countries who rely on natural gas have been held hostage by the Russian energy company, Gazprom. Our friends in Poland, Hungary, and the Czech Republic know this better than anyone. Cheap U.S. natural gas exports would reduce the Russian stranglehold on the European market and give the U.S. more political clout at the expense of Russia. In the Pacific, allies like Japan and Korea pay very high prices for natural gas. They would be immediate importers of cheaper U.S. natural gas if we were allowed to sell it to them.

Perhaps more than anyone, our friends in India have been the most vocal. The current Indian Ambassador to the United States recently wrote in a Wall Street Journal op ed that U.S. natural gas exports to India, "would provide a steady, reliable supply of clean energy that would help reduce [India's] crude oil imports from the Middle East and provide reliable energy to [India]."

Without U.S. natural gas, the Indians might have to participate in the Iran, Pakistan gas pipeline. We have given the Indians a reasonable alternative. We should use it. Liberalizing our natural gas export policy will provide certainty to allies and economic partners around the world that the United States is an advocate of free trade.

On a side note, we have the problem with the World Trade Organization. The WTO punishes countries that limit exports to keep their own domestic prices down. The U.S. has a World Trade Organization case against China for doing exactly that with its rare-earth minerals. But here the DOE is limiting our own natural gas exports. If this policy continues, there is a possibility we could be sanctioned by the WTO and our entire trade regime could be hurt.

So the DOE should let the free market work and approve pending applications. The U.S. has the best technology and the safest technology in the world, but our competitors with their own natural resources, like China, are catching up.

The purpose of this hearing is to explore natural gas exports from the United States to other nations.

And now, I will yield to the ranking member, Mr. Sherman from California, for his opening statement.

Mr. SHERMAN. Thank you, Mr. Chairman. I commend you for holding these hearings. Ordinarily, people don't think natural gas is a focus of the Foreign Affairs Committee, let alone this subcommittee. But the fact is that while the Ways and Means Committee is the primary committee to deal with imports and taxation

thereof, it is our committee that has primary jurisdiction over exports, export promotion, and export control. It is interesting that the private sector invested billions in building terminals to import liquefied natural gas and now wants to retool them to export. And it is clear that the price as structured now justifies that. My fear if I was an investor, and I am not, is that by the time we are ready to export, we will have already exported our fracking technology, which we are exporting now, and there will be discoveries of natural gas on the Eurasian landmass that will allow the piping of natural gas to the very people that anticipate buying our liquefied natural gas.

Whether to develop in full our natural gas resources, and whether to export natural gas brings up environmental, national security, and economic concerns. From a national security standpoint, I am particularly interested in vehicle propulsion. Vehicle propulsion is the domain of petroleum worldwide, and it is our dependence on petroleum imports and the world's dependence on petroleum imports that determines much of foreign policy around the world. Right now you can get twice as many miles per dollar with a natural gas vehicle as with a petroleum-based vehicle. If we start exporting natural gas that may change. We may need to have a huge differential between the price of natural gas and the price of gasoline in order to encourage use of natural gas to propel trucks and perhaps even cars.

On the other hand, it is in our national security interest as the chairman points out, to provide secure natural gas supplies for our allies and to prevent India from turning to Iran for a natural gas pipeline.

As to economics, there are jobs involved in developing the infrastructure to export our natural gas. There are also jobs involved in our manufacturers and our petrochemical companies having cheaper natural gas than anyone else. Many countries with a valuable export deliberately prevent the export of the raw material in order to give the processing jobs and the use of that raw material jobs to their domestic market. In addition, we are currently exporting coal. So if we start exporting natural gas, we will be burning more of our own coal, and if we choose not to, will we simply be exporting more of our own coal?

As to the environmental side, natural gas is the best fossil fuel, which may—environmental-wise, not be a particular compliment. But to the extent that we don't develop our natural gas resources, or that we export them, will we be burning more coal? How will that count against us in the international calculations of carbon emissions, and eliminate our efforts or deter our efforts to be able to get other countries to stop exporting. I believe my time is expired, but if I can go on for a little bit longer, I hope.

Mr. POE. The gentleman is recognized for a little bit longer.

Mr. SHERMAN. Okay, thank you. So, and finally on the economic side, we have consumers. The only thing my constituents will understand about these hearings after they get point and counterpoint is that their natural gas bills are lower now than they used to be and they would like to keep it that way.

We want to find out what is the expense of shipping natural gas compared to shipping coal because they are usable by the customer

for the same purpose. We will want to focus on what advantages our manufacturers and petrochemical companies will have if they can pay half for natural gas what other people are paying or less than half. So it cannot be said that we are here to make sure that there are jobs in one industry without hearing what jobs might be available through another process.

With that, I think my little bit longer has been exhausted and I yield back.

Mr. POE. I now recognize the vice chair of this subcommittee, the gentleman from Illinois, Mr. Kinzinger.

Mr. KINZINGER. Thank you, Mr. Chairman, and thank you for holding this important hearing on gas exports. Since the 1930s, we have exported natural gas via a pipeline to Canada and Mexico, and more recently, starting in 1969, the U.S. began exporting natural gas to Japan, at that time a non-free trade agreement country from the Kenai Peninsula in Alaska.

However, given this history of exporting natural gas, the Department of Energy has only granted a single permit to export liquefied natural gas to another non-FTA while approximately 20 remaining LNG export applications remain in limbo. What would approval of these 20 remaining LNG export applications mean for the American economy? I believe that the answer is somewhat simple. It means American jobs. The majority of the economic studies analyzing a wide range of scenarios found increased LNG exports would produce a net economic gain to the U.S. economy, resulting in an increase in U.S. households' real income. At a time when the economy continues to struggle, we need to support policies that encourage domestic job growth.

I do want to, however, say a note of caution. I represent an area of heavy manufacturing, and especially in the Rockford area in Illinois. We have a lot of manufacturing, and cheap energy has actually been very effective in bringing manufacturing back to the United States and making us competitive with the rest of the world. A question that I do legitimately want answered is, what will exporting natural gas do to natural gas prices here at home because I fear that a skyrocket in domestic natural gas prices would, in fact, lead to a hurt in the manufacturing sector as energy prices skyrocket again.

But that said, the Department of Energy concludes that for every one of these market scenarios examined, net economic benefits increase as the level of LNG exports increase. And I am interested in hearing from our panel about the impact increased LNG exports will have on our national security interest around the world. LNG exports ought to support our allies, and I believe they could provide an important alternative to Middle Eastern or Russian competition that currently dominates the market.

And thank you, chairman, I yield back.

Mr. POE. Anyone else wish to make an opening statement? Without objection, all of the witnesses' prepared statements will be made part of the record. I ask each witness to keep your presentation to 5 minutes, so that we can move along in this process and have questions and answers.

I will introduce each of the witnesses at this time, and then we will have the witnesses' opening statements.

Mr. Rob Bryngelson is the president and chief executive officer of Excelerate Energy in The Woodlands, Texas. Before helping found Excelerate Energy he worked as managing director in El Paso Corporation's Global LNG Group where he was responsible for LNG infrastructure development, supply, procurement, and downstream marketing for North America. Dr. David Montgomery is a senior vice president at NERA Economic Consulting, and helped lead the study that the DOE commissioned on the economic impact of LNG exports. Prior to NERA, Dr. Montgomery held a number of senior positions in the United States Government, including Assistance Director of the United States Congressional Budget Office, and Deputy Assistant Secretary for Policy in the U.S. Department of Energy during the Carter administration. Dr. Michael Levi is the David Rubenstein senior fellow for Energy and the Environment at the Council on Foreign Relations, and director of the CFR program on Energy Security and Climate Change. Before joining CFR, Dr. Levi was a fellow at the Brookings Institution and director of the Federation of American Scientists Strategic Security Project. Mr. David Mallino is the legislative director at the Laborers International Union of North America. He previously worked for the American Federation of Labor, Congress of Industrial Organizations, and National Environmental Education and Training Center. And Mr. Michael Ratner is a specialist in energy policy at the Congressional Research Service focusing on natural gas and all markets. His recent CRS work has addressed U.S. LNG exports and U.S. natural gas demand and prior to joining CRS, Mr. Ratner was a senior energy analyst at the Central Intelligence Agency.

Mr. Bryngelson, we will start with you. You have 5 minutes.

STATEMENT OF MR. ROB BRYNGELSON, CHIEF EXECUTIVE OFFICER, EXCELERATE ENERGY

Mr. BRYNGELSON. Thank you, Chairman Poe, Ranking Member Sherman, members of the subcommittee. My name is Rob Bryngelson. I am the president and CEO of Excelerate Energy. I appreciate the opportunity to appear before the subcommittee today to share Excelerate's views on the current status of the natural gas industry relating specifically to liquefied natural gas exports, the positive impacts both to Texas and the Nation associated with LNG exports, and finally, Excelerate's views on the Department of Energy approval processing to export LNG.

I have submitted more extensive written testimony for the record, therefore, I will use this time to summarize a few key points. Excelerate Energy was established in 2003 and is based in the Woodlands, Texas. We are the world's largest provider of floating storage and regasification vessels, and are engaged in the development, construction, and operation of liquefied natural gas, transportation and regasification infrastructure worldwide.

In 2009, Excelerate initiated front-end engineering design efforts to construct the world's first floating liquefaction, storage, and offloading unit capable of taking U.S. domestically-produced natural gas and processing it into LNG for export. The project is referred to as the Lavaca Bay LNG project, and will be located in Calhoun County along the Texas Gulf Coast.

U.S. residential, commercial, and industrial consumption is not expected to increase quickly enough to offset the growth of natural gas production which has led to projections of sustained low prices in the U.S. rapid growth in U.S. natural gas production has driven gas prices to historically low levels, resulting in decreased investment by the natural gas industry, and a reduction in associated economic activity. It is our belief that exporting domestically produced LNG will meaningfully contribute to the public interest in a variety of ways including creating more jobs, greater tax revenues, and increased economic activity; introducing new competitive supplies into world gas markets leading to improved economies among America's trading partners and providing better opportunities for U.S. products and services abroad; promoting greater national security through a larger role in international energy markets; increasing production capacity that will better adjust to varying domestic demand scenarios; reducing the volatility of domestic natural gas prices; and improving the U.S. balance of payments by between $2.4 billion and $4.4 billion annually per project through the export of natural gas and the displacement of imports of other petroleum liquids.

On October 28, 2012, Excelerate filed its application with the Department of Energy for the export of LNG to non-free trade agreement countries. Excelerate remains in the queue with 18 other companies awaiting DOE approval. In its non-FTA application to DOE, Excelerate included two independent economic studies focused on the specific project area and the U.S. as a whole. The independent studies concluded that the project would have a positive impact on the region surrounding the project site comprising Calhoun and Jackson Counties as well as on Texas as a whole and the Nation.

After receiving approval from the FERC to proceed, Excelerate will begin the nearly 4-year construction process to complete Phase I of the Lavaca Bay LNG project. The construction and operation of the project will stimulate local, regional, and national economies through job creation, increased economic activity, and tax revenues. Much of the technology, equipment, and material needed to construct the project will be obtained domestically. I have included in my written testimony specific data concerning jobs, tax revenue, and other key benefits of the project.

DOE is required to authorize exports to a foreign country unless there is a finding that such exports will not be consistent with the public interest. We concur with the DOE policy guidelines which emphasize free market principles and promote limited government involvement in Federal natural gas regulation. Previously, other issues considered in making the public interest determination have included local interests, international effects, and the environment.

Excelerate's primary concern is the timing of such non-free trade approvals. As you are aware, there are a multitude of projects around the world offering LNG supplies that are competing with the U.S.; specifically, Australia, East Africa, and the Eastern Mediterranean.

Further delays are likely to result in buyers concluding that other potential LNG sources provide greater certainty and the focus on U.S. exports will diminish. This would be a considerable

economic loss for our Nation. In addition, with only authorization to sell to free trade nations, we are limiting the potential pool of potential customers. As one would expect, with a limited customer base, those volumes of natural gas liquefied and exported will see lower prices than if a more expanded pool of purchasers were available.

In conclusion, the overall outlook for domestic natural gas production is promising. Without a significant increase in U.S. residential, commercial, and industrial demand, the current rate of consumption is not enough to offset growth and production, and may contribute to artificially low prices for natural gas in the U.S. This rapid growth without increased demand is already resulting in decreased investment by the natural gas industry and a reduction in associated economic activity.

It is crucial that DOE move expeditiously to act on the pending export applications before other countries lock up customers with their own exports and the U.S. loses this opportunity.

Thank you again for allowing me the opportunity to appear before the subcommittee today, and I look forward to answering any questions that you may have.

Mr. POE. Thank you.

[The prepared statement of Mr. Bryngelson follows:]

Testimony of Robert Bryngelson
President and Chief Executive Officer
Excelerate Energy, LP

Before the House Committee on Foreign Affairs
Subcommittee on Terrorism, Nonproliferation and Trade
April 25, 2013

Hearing on "Natural Gas Exports: Economic and Geopolitical Opportunities"

Thank you Chairman Poe, Ranking Member Sherman and members of the Subcommittee. My name is Rob Bryngelson, and I am the President and CEO of Excelerate Energy. I appreciate the opportunity to appear before the Subcommittee today to share Excelerate's views on 1) the current status of the natural gas industry, relating specifically to liquefied natural gas (LNG) exports; 2) the positive economic impacts, both to Texas and to the nation, associated with LNG exports; 3) and finally, Excelerate's views on the Department of Energy (DOE) approval process to export LNG.

Excelerate Energy, LP

Excelerate Energy, LP (Excelerate) is a Texas-based energy company engaged in the development of LNG transportation and regasification infrastructure, a provider of LNG storage and regasification services, and an importer of LNG. The company operates a fleet of eight purpose-built LNG carriers capable of regasifying LNG on board the vessel for delivery as gaseous natural gas to downstream customers worldwide. Excelerate also operates as a global LNG Marketing and Trading organization.

Established in 2003 and headquartered in the Woodlands, Texas, Excelerate also has facilities in London, Dubai, Kuwait City, Buenos Aires, Israel, and Rio de Janeiro.

In 2009, Excelerate Liquefaction Solutions, LLC (ELS), a wholly-owned subsidiary of Excelerate, initiated Front End Engineering and Design (FEED) efforts to construct the world's first floating liquefaction, storage, and offloading unit (FLSO) capable of taking US domestically produced natural gas and processing it into LNG for export. The project will be referred to herein as the Lavaca Bay LNG Project.

Lavaca Bay LNG Project

ELS proposes to design, construct, and operate a Floating Liquefaction Storage Offloading (FLSO) unit to be located on the Gulf Coast in Port Lavaca, Texas in two phases. The first phase of the project will consist of one FLSO unit with a storage capacity of 250,000 cubic meters of LNG, and a liquefaction capacity of up to 5 million tons per annum (MTPA) or the equivalent of 0.665 billion cubic feet per day (Bcf/day) of natural gas. Phase 1 has a target commercial operation date of the first quarter of 2018. Phase 2 of the project, which would commence approximately 6 to 9 months later if sanctioned, will add a second FLSO unit , essentially doubling the LNG production capacity of the facility .

On October 28, 2012, ELS filed its application with the DOE for export to non-Free Trade Agreement (FTA) countries. ELS remains in the queue with 18 other companies, awaiting DOE approval. In its non-FTA application to DOE, Excelerate Energy included two independent economic studies focused on the specific project area and the U.S. as a whole. The conclusions from each of these independent studies concurred with the findings of both studies commissioned by the DOE. The independent studies concluded that the project would have a positive impact on the project site (Calhoun and Jackson Counties), Texas and nationally.

Project Location – Calhoun County, Texas

The Lavaca Bay LNG project is strategically located, allowing LNG shipments from the facility to reach international markets efficiently. Shipments can be made to Brazil in 10 days, to England in 13 days, and to East Asian markets through the Panama Canal in 24 to 26 days. The 85 acre project site was previously permitted by the FERC as an LNG import terminal and lies in an already industrialized area. In choosing this location, ELS sought to take advantage of the previous project's positive NEPA review and outcome. Since initiating the project development, ELS has met with key stakeholders in the area and has been met with enthusiasm for the project.

Local Area Benefits

Upon receipt of its Section 3 authorization to proceed from FERC, ELS will begin the nearly four-year construction process to complete Phase 1 of the Lavaca Bay LNG Project. Phase 1 is expected to become operational by the beginning of 2018 and will involve total construction expenditures of approximately $2.4 billion, of which $1.5 billion will go towards the LNG vessel which will be built in South Korea (all figures are in 2012 dollars). The project will have annual operation and maintenance

(O&M) costs of approximately $67 million (rounding up) during its operating life. These Phase 1 expenditures are broken down further in Table ES-1. Phase 2 construction will benefit from some of the infrastructure elements as well as deepening and widening of the Matagorda Channel included with the Phase 1 capital expenditures. Overall cost of Phase 2 is estimated to be approximately $2.0 billion, approximately 15% less than Phase 1

The Phase 1 analysis further divided construction and O&M expenditures according to the assumed sector of expenditure, and according to the geographic region in which expenditures were expected to occur. Geographical areas in the study include several counties near the project site (called the Primary Impact Area), the state of Texas (other than the Primary Impact Area counties) and the U.S. (other than Texas and the Primary Impact Area). Economic impacts were estimated for each of these areas and combined to derive the cumulative impact of the project.

Table ES-1 Early Feed Estimates of Phase 1 Direct Construction and Operational Expenditures on the Lavaca Bay LNG Project (2012 Dollars)

CONSTRUCTION PHASE		OPERATIONAL PHASE (YEARLY EXPENDITURES)	
FLSO Vessel*	$1,300 million	Supervisors/engineering/ terminal labor & expenses	$12.2 million
Pipeline	$170 million	Operations	$8.6 million
On-Shore and Dredging Expenditures		FLSO maintenance	$3.1 million
Jetty/Site structures and processing	$275 million	On-shore facility maintenance	$7.5 million
Dredging	$400 million	Administration & General	$10.1 million
		Total O&M	$[illegible] million

*Includes $13.5 million estimate for front end engineering and $12 million in estimated permitting costs. Source *Black & Veatch Economic Impacts of the Lavaca Bay Project*, 2013.

The cumulative impact of project construction includes:

- Construction expenditures are projected to support or create 21,367 jobs, or an average of 7,122 jobs per year during the three year construction period.
- Construction expenditures are estimated to create more than $1.37 billion in labor income at an average of $64,163 per job across all impacted industries.
- Construction expenditures are estimated to contribute more than $2.06 billion in value added to the local economy from labor expenses, services created to support the project construction, i.e. housing, consumables, etc.
- Construction expenditures are estimated to account for nearly $3.32 billion in total economic output, which is the total value of production from all industries impacted by the investment.
- Construction expenditures are projected to generate more than $154 million in state and local taxes and nearly $242 million in total federal tax revenues.

Phase 1 operational expenditures will also generate long term economic benefits. The studies focused primarily on the economic impacts of O&M expenditures (estimated to be nearly $67 million per year) during the operational period and found the impacts from these expenditures to be significant.

The total expected impacts during each year of operation are projected to include the following:

- O&M expenditures are projected to support or create 696 jobs.
- O&M expenditures are estimated to create nearly $50 million in labor income.
- O&M expenditures are estimated to contribute nearly $66 million in value added to the local economy from added spending by permanent labor 0 housing, consumables, etc., services brought in to support the facility, i.e., engine manufacturers, training center, etc.
- O&M expenditures are estimated to account for more than $102 million in total economic output.
- O&M expenditures are projected to generate more than $3.7 million in state and local taxes each year and nearly $6.0 million in total federal tax revenues.

Status of the U.S. Natural Gas Industry

From the formation of Excelerate in 2003 to the present, Excelerate has monitored the domestic and international natural gas industry, and has developed and implemented technology to address changing

industry trends. In 2005, Excelerate commissioned the first offshore LNG import facility in the world to bring additional natural gas into the U.S. By 2009, the price of natural gas decreased to levels that made importing foreign-sourced natural gas into the US uneconomic. Importation of LNG into the U.S. was restricted to facilities that had long-term contracts executed before the fall in natural gas prices. Today, Excelerate has been motivated by the improved overall outlook for domestic natural gas production resulting from drilling productivity gains which have enabled rapid growth in supplies in South Texas and elsewhere in the U.S.[1] U.S. residential, commercial and industrial consumption is not expected to increase quickly enough to offset growth in production, which has led to projections of sustained low prices for natural gas in the U.S. Rapid growth in U.S. natural gas production has driven wellhead prices to historically low levels,[2] resulting in decreased investment by the natural gas industry[3] and a reduction in associated economic activity. Low wellhead prices also have encouraged increased flaring of natural gas that otherwise would have been recovered.[4] It is our belief that the export of domestically produced LNG represents a market driven path toward deploying the country's vast energy reserves in a manner meaningfully contributing to the public interest in a variety of ways:

- More jobs, greater tax revenues, and increased economic activity;
- New competitive supplies introduced into world gas markets, leading to improved economies among America's trading partners, and providing better opportunities for U.S. products and services abroad;
- Promote greater national security through a larger role in international energy markets, and assisting our allies to reduce dependence on foreign oil through co-production of oil and natural gas liquids that might otherwise be uneconomic;

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[1] Domestic wellhead natural gas production in 2011 totaled 28.57 Tcf, the highest in U.S. history. *See U.S. Energy Information Administration ("EIA"), Natural Gas Gross Withdrawals and Production,* http://www.eia.gov/dnav/ng/ng_prod_sum_dcu_NUS_a.htm.

[2] Henry Hub natural gas futures on the New York Mercantile Exchange ("NYMEX") have traded at times during 2012 at the lowest price levels seen since 2002. *See David Bird, US Gas: Futures Slip to Fourth-Straight New Decade Low on Glut,* Dow Jones Energy Service, Apr. 13, 2012.

[3] For example, earlier last year, Chesapeake Energy announced that it in response to low natural gas prices, it "plans to ... reduce its operated dry gas drilling activity by 50%." It also stated that "Chesapeake's operated dry gas drilling capital expenditures in 2012, net of drilling carries, are expected to decrease to $0.9 billion, a decrease of approximately 70% from similar expenditures of $3.1 billion in 2011."

[4] A total of 165.9 Bcf was vented or flared in 2010, an increase of 72.1% from vented and flared volumes of 96.4 Bcf in 2004. The World Bank-led Global Gas Flaring Reduction Partnership estimates that natural gas flaring in the U.S. increased 7.1 billion cubic meters in 2011, equivalent to an increase of 250 Bcf. *See EIA, Natural Gas Gross Withdrawals and Production, supra note 13; Press Release, World Bank Sees Warning Sign in Gas Flaring Increase* (July 3, 2012), http://www.worldbank.org/en/news/2012/07/03/world-bank-sees-warning-sign-gas-flaring-increase.

- Increased production capacity that will better adjust to varying domestic demand scenarios;
- Less volatile domestic natural gas prices;
- Improve the U.S. balance of payments by between $2.4 billion and $4.4 billion annually per terminal, through the export of natural gas and the displacement of imports of other petroleum liquids;[5] and
- Increase economic trade and ties with foreign trading partners and hemispheric allies, and displace environmentally damaging fuels in those countries.

As of March 7, 2013, the DOE has approved 23 long-term applications to export domestically produced LNG (does not include Alaska) to FTA countries, and is currently evaluating 19 applications for long-term export authorization to non-free trade agreement countries. The number of proposed export facilities actually constructed, will be primarily driven by the market, but will also be influenced by the DOE decision making process on the non-FTA applications. Further delays in authorizing the U.S. to export domestically produced LNG will be detrimental to the growth of the natural gas industry. As increased international supplies of LNG become available from areas such as Australia, non-FTA countries will no longer have to wait on the U.S. for supply, and the U.S. will be the loser.

DOE Approval Process

DOE is required to authorize exports to a foreign country unless there is a finding that such exports "will not be consistent with the public interest."[6] In 1984, DOE issued a set of Policy Guidelines delineating the criteria that it should utilize in reviewing applications for natural gas imports,[7] and the agency has applied these criteria to its review of applications for natural gas exports as well.[8] We concur with the DOE *Policy Guidelines* which emphasize free market principles and promote limited government involvement in federal natural gas regulation:

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[5] B&V Report at 12 (based on $1.2 - 2.2 billion for Phase I alone, exporting 4 MPTA). Other studies have found even greater benefits for individual LNG export terminals. B&V Report at 14-15.
[6] 15 U.S.C. § 717b(a) (2012).
[7] *Policy Guidelines and Delegation Orders Relating to the Regulation of Imported Natural Gas*, 49 Fed. Reg. 6,684 (Feb. 22, 1984), hereinafter "*Policy Guidelines*".
[8] *See Phillips Alaska Natural Gas Corp. and Marathon Oil Co.*, FE Docket No. 96-99-LNG, Order No. 1473, at 14 (Apr. 2, 1999) (citing *Yukon Pacific*, Order No. 350, 1 FE ¶ 70,259, at 71,128), hereinafter "*Phillips Alaska*, DOE/FE Order No. 1473".

> The market, not government, should determine the price and other contract terms for imported [and exported] gas. U.S. buyers [and sellers] should have full freedom - along with the responsibility - for negotiating the terms of trade arrangements with foreign sellers [and buyers].
>
> The government, while ensuring that the public interest is adequately protected, should not interfere with buyers' and sellers' negotiation of the commercial aspects of import [and export] arrangements. The thrust of this policy is to allow the commercial parties to structure more freely their trade arrangements, tailoring them to the markets served.[9]

The *Policy Guidelines* provided some insight into the public interest standard for evaluating potential import and export applications, emphasizing that the "policy cornerstone of the public interest standard is competition."[10] Competitive import/export arrangements are therefore an essential element of the public interest, and so long as the sales agreements are set in terms that are consistent with market demands, they should be considered to "largely" meet the public interest standard.[11] The *Policy Guidelines* also provide that "[t]his policy approach presumes that buyers and sellers, if allowed to negotiate free of constraining governmental limits, will construct competitive import [and export] agreements that will be responsive to market forces over time."[12]

ELS has recognized the importance that DOE places on its consideration of the domestic need for gas to be exported, stating: "the review of export applications in decisions under current delegated authority [focuses] the domestic need for the gas to be exported; whether the export poses a threat to the security of domestic natural gas supplies; [as well as] any other issue determined to be appropriate, including whether the arrangement is consistent with DOE's policy of promoting competition in the marketplace by allowing commercial parties to freely negotiate their own trade arrangements."[13] Previously, other issues considered in making the public interest determination have included local interests, international effects and the environment.

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[9] *Policy Guidelines*, *supra* note 33, at 6685.
[10] *Id.* at 6687.
[11] *Id.*
[12] *Id.* (referencing "exports" inserted to reflect DOE policy that "the principles are applicable to exports as well" as enunciated in *Phillips Alaska*, DOE/FE Order No. 1473, supra note 34, at 14).
[13] *Sabine Pass*, DOE/FE Order No. 2961, *supra* note 22, at 29.

ELS believes that it has met the DOE criteria for approval of the project's non-FTA Application. ELS recognizes that the projections are estimates of the future, and as such, the accuracy of the forecasting methodology, projections of supply, cost of supply, demand, and future technological innovation offered are estimates as well. Nonetheless, these projections represent the best measures available for determining whether a future export would be in the public interest or not.

Domestic Need for U.S. Gas to be Exported

We believe the export of U.S. gas to FTA countries, as well as to non-FTA countries, is in the public interest because it (i) would not impair the ability of domestic natural gas consumers to obtain adequate supplies at appropriate prices; (ii) would promote a stable domestic gas industry during times when domestic demand for natural gas is depressed; and (iii) would enhance domestic natural gas production capacity which can provide greater elasticity of supplies to meet domestic demand on short notice under a variety of conditions, in lieu of relying heavily on increases in domestic prices to bring demand in line with less elastic supplies.

Drilling productivity and extraction technology improvements have enabled rapid growth in the overall U.S. gas supply. Proven natural gas reserves have increased by 97.2 Tcf (44%) between 2006 and 2010.[14] As U.S. natural gas resources and production have increased, U.S. natural gas prices have fallen markedly. The annual average Henry Hub price for natural gas fell from over $10.00 per MMBtu in late 2005 to $3-3.50 in late 2011.[15] In its most recently calculated *Annual Energy Outlook 2012* reference case, EIA estimates that the annual average wellhead price for natural gas, stated in 2010 U.S. dollars, will remain under $5.00 per MMBtu through at least 2025, and rise to only $6.48 by 2035.[16] Prices for natural gas in the U.S. market are now substantially below those of most other major gas-consuming countries. While U.S. gas prices have fallen, prices for LNG in other major gas consuming countries have increased sharply over the past decade. The result is that domestic gas can be liquefied and exported to foreign markets on a very competitive basis. As discussed below, such exports can be expected to have only a nominal effect on U.S. prices.

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[14] Energy Information Administration, *Natural Gas Reserves Summary as of Dec. 31 ,2010*, available at http://www.eia.gov/dnav/ng/ng_enr_sum_a_epg0_r11_bcf_a.htm

[15] EIA statistics available at http://www.eia.gov/dnav/ng/hist/rngwhhdd.htm (September 2012).

[16] Energy Information Administration, *2012 Annual Energy Outlook, Reference Case* (Aug, 2012).

National Supply – Overview

Domestic gas production and reserves collectively provide an abundant domestic supply of natural gas. Domestic gas production has been on a significant upward trend in recent years as rapid growth in supply from unconventional discoveries has more than compensated for declines in production from conventional onshore and offshore fields. EIA estimates that U.S. dry natural gas production was 63.2 Bcf/d in August 2011, a 6.2% increase over August 2010 dry natural gas production of 59.5 Bcf/d.[17] Increased drilling productivity in certain prolific shale gas formations, including the Marcellus and Haynesville shales, has enabled domestic production to continue expanding despite a reduction in the number of wells drilled.

In its *Annual Energy Outlook 2011,* EIA noted that U.S. shale gas production grew at an average rate of 17% between 2000 and 2006. The rate of growth accelerated substantially during the period from 2006 to 2010, with an annual growth rate averaging 48%. EIA expects this increase in shale gas production to continue through 2035, when it will make up an estimated 47% of total U.S. natural gas production, up considerably from a 16% share in 2009.

EIA has significantly increased its estimate of shale gas production for 2015, 2020, 2025, 2030, and 2035 compared with EIA's projections in the *Annual Energy Outlook 2011.* For example, EIA revised its projected shale gas production for 2015 from 3.85 Tcf to 8.24 Tcf. [18] Similarly, EIA revised its projection of shale gas production for 2035 from 6.00 Tcf to 13.63 Tcf.[19]

The growth in shale gas production has been accompanied by an increase in the overall volume of U.S. natural gas resources. In 2011, EIA substantially increased its estimate of technically recoverable natural gas resources in the U.S. to 2,543 Tcf.[20]

This growth in U.S. natural gas resources is reflected in other recent academic and industry evaluations. In April 2011, the Potential Gas Committee of the Colorado School of Mines determined that the U.S. possesses a future available gas supply of 2,170 Tcf, the highest resource evaluation in the group's 46-

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[17] Energy Information Administration *Natural Gas Gross Withdrawals and Production,* available at http://www.eia.gov/dnav/ng/hist/n9070us2m.htm

[18] Energy Information Administration *Annual Energy Outlook 2012* at Table A-14; Energy Information Administration, *Annual Energy Outlook 2011* at Table A-14, (Apr. 2011).

[19] *Id.*

[20] Energy Information Administration *Assumptions to the Annual Energy Outlook 2011,* Table 9.2, *available at http://www.eia.gov/forecasts/aeo/assumptions/pdf/0554(2012).pdf*

year history, and enough to satisfy 90 years of domestic market needs based on 2010 consumption.[21] This assessment included 687 Tcf of shale gas resources, which is 32% of the total available supply.[22]

In its recently published study, The Future of Natural Gas ("MIT Report"), the Massachusetts Institute of Technology estimates that the U.S. has a mean remaining resource base of approximately 2,150 Tcf.[23] This estimate includes approximately 1,000 Tcf of recoverable shale gas resources,[24] and approximately 400 Tcf of which could be economically developed with a gas price at or below $6/MMBtu at the well-head.[25]

According to the July 2011 report titled "Shale Gas and U.S. National Security" by the James A. Baker III Institute for Public Policy at Rice University, North America has a mean technically recoverable shale gas resource of 937 Tcf, with 637 Tcf of that located in the U.S. The report assigns a weighted mean break-even price for U.S. shale gas resources of $5.42/MMBtu.[26] This report indicates that the break-even price is the average price needed for development of up to 60 percent of the identified technically recoverable resource.[27]

A July 2011 report commissioned by EIA, estimates U.S. onshore lower 48 states shale gas resources to be 750 Tcf.[28] These studies and reports indicate that the U.S. has a 90- to an over 100-year inventory of recoverable natural gas resources. This inventory is expected to continue growing as further advancements in drilling technology are deployed to exploit additional shale gas opportunities.

Regional Supply

The proposed ELS terminal will be located in an area with robust access to natural gas supplies due to a highly integrated and well developed natural gas pipeline system. ELS expects the project to directly interconnect with interstate pipelines with an existing capacity of at least 3.6 Bcf per day and up to

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[21] Potential Gas Committee, "Potential Supply of Natural Gas in the United States: Report of the Potential Gas Committee (Dec 31,2010)," *available at* http://www.potentialgas.org/PGC%20Press%20Conf%202011%20slides.pdf (Apr. 2011).
[22] *Id.*
[23] Massachusetts Institute of Technology, *The Future of Natural Gas*, at 24 (Fig. 2.8), *available at* http://web.mit.edu/mitei/research/studies/documents/natural-gas-2011/NaturalGas_Report.pdf (2011).
[24] *Id.*
[25] *Id.* at 31 (Fig. 2.14(b).
[26] The weighted mean break-even price for United States shale gas resources was calculated based on break-even price estimates presented in the MIT Report.
[27] Baker Institute, *Shale Gas and U.S. National Security* at pp. 24-25 (July 2011).
[28] Energy Information Administration, *Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays*, at p. 5, *available at* http://www.eia.gov/analysis/studies/usshalegas/pdf/usshaleplays.pdf (July 2011).

approximately 4.6 Bcf per day.[29] In addition to substantial existing gas transportation capacity in the region, the area is blessed with large quantities of natural gas resources. All of the gas used as feedstock to run the facility (1.2 Bcf/d) can come from Texas production.[30] This increased demand is not expected to result in a large increase in production by the shale deposits in South Texas because these deposits are of sufficient quality to be developed regardless of the ELS terminal. Instead, most of the demand associated with the ELS Terminal will be satisfied through displacement with only about one-third of the needed supply coming from incremental production within Texas.[31]

National Natural Gas Demand

Over the past decade, there has been essentially no growth in the demand for natural gas in the U.S. According to data published by EIA, natural gas demand in 2011 was only 4.2% higher than in 2000.[32] In its *Annual Energy Outlook 2012,* EIA estimated long term annual U.S. demand growth of only 0.4%, with demand expected to reach 26.6 Tcf in 2035 (compared to 22.8 Tcf of actual demand in 2009).[33]

The table below presents a comparison of actual demand and prices in 2011 and forecasted demand and prices in the year 2020, based on information presented in the *Annual Energy Outlook 2012.*[34]

	2011	**2020**
Natural Gas Demand (Bcf/day)	67.2	69.8
Henry Hub Spot Price ($/MMBtu)	3.94	4.58
Average Lower 48 Wellhead Price ($/MMBtu)	3.72	4.10

The consensus of estimates by EIA and academic and industry experts is that the U.S. has between 2,000 and 2,543 Tcf of recoverable natural gas resources. Even at 100% utilization, the Project would

[29] B&V Report at 9.
[30] Deloitte MarketPoint, *Analysis of Economic Impact of LNG Exports from the United States*, at p. 14.
[31] Id.
[32] Energy Information Administration, *Natural Gas Consumption by End Use available at* http://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm.
[33] Energy Information Administration, *Annual Energy Outlook 2012,* Table A13.
[34] Energy Information Administration, *Annual Energy Outlook 2012* Table 13, *available at* http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2012&subject=0-AEO2012&table=13-AEO2012&region=0-0&cases=ref2012-d020112c. Volumes state in Tcf per year in the *Annual Energy Outlook 2012* were converted Bcf per day. In addition, 2010 volumes and prices were updated to 2011 actual volumes and prices, based on EIA Natural Gas Summary available at: http://www.eia.gov/dnav/ng/ng_sum__lsum_dcu_nus_a_htm.

result in maximum natural gas requirements of 10.7 Tcf over the 20-year term of the requested authorization[35]. This represents only 0.42% to 0.53% of total estimated recoverable U.S. natural gas resources.

Supply-Demand Balance Demonstrates Weak National and Regional Need

As discussed above, the enormous available domestic supply of natural gas dwarfs current U.S. demand, and even under the extreme case of operating at 100% utilization, the natural gas to be exported from the ELS Terminal is substantially less than 1% of the available resources. The current low price of natural gas is a consequence of a buyer's market due to plentiful supply and limited domestic need. The interest in exporting gas from the U.S. despite the billions of dollars of investment to develop a single LNG export terminal is a reflection of these market conditions.

As more fully described in the Deloitte MarketPoint Analysis, the issue is not merely one of volume, but also of price impact. "In a free market economy, price is one of the best measures of scarcity, and if price is not significantly affected, then scarcity and shortage of supply typically do not occur. A key determinant to the estimated price impact is the supply response to increased demand including LNG exports."[36] The Deloitte MarketPoint Analysis's modeling approach accounts for this supply-demand dynamic and considers how producers will change their production in response to demand, rather than simply assuming that supply will be brought into equilibrium with increase demand through a change in price.[37] The result of this modeling "indicates that the projected level of exports is not likely to induce scarcity on domestic markets."[38]

Price Impacts – Natural Gas

The two studies commissioned by ELS in conjunction with its Application address the subject of price impacts related to the export of natural gas from the U.S. via the ELS terminal. The Deloitte MarketPoint Analysis considers LNG exports ranging from 1.33 Bcf/d (ELS Terminal exports only) to 12 Bcf/d (ELS Terminal plus 9.67 additional Bcf/d of exports from other Gulf of Mexico terminals plus

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[35] This number was calculated by multiplying 1.33 Bcf/d by 365 days/year times 20 years and increasing the result by 10% to allow for losses and gas to operate the ELS Terminal.
[36] Deloitte MarketPoint, *Analysis of Economic Impact of LNG Exports from the United States*, at p. 1.
[37] Id. at p. 2
[38] Id. at p. 4

1 Bcf/d of Cove Point exports).[39] The results of the Deloitte MarketPoint Analysis are reflected in Figure 2 of that study, which are set forth below:

Export Case	Average U.S. Citygate	Henry Hub	New York
1.33 Bcf/d	0.4%	0.4%	0.3%
3 Bcf/d	1.0%	1.7%	0.9%
6 Bcf/d	2.2%	4.0%	1.9%
9 Bcf/d	3.2%	5.5%	3.2%
12 Bcf/d	4.3%	7.7%	4.1%

In no case did the impacts on average U.S. Citygate prices for the assumed years of operation of the ELS terminal (2018-2037) reach even 5% and Henry Hub, which experiences a greater impact due to its proximity to the modeled location of most of the exports, is expected to have only a 7.7% increase. This equates to a maximum price increase of 30 cents per MMBtu at the U.S/ Citygate and 50 cents at Henry Hub[40] -- a change smaller than that frequently experienced by the natural gas industry due to other causes. As the price of natural gas rises, the industry is able to produce more natural gas than had to be consumed to cause the initial price increase. Thus, natural gas becomes more abundant and it takes ever larger jumps in demand to produce additional price increases of a similar magnitude, muting the price impacts of changing demand.[41]

The benefits associated with the Lavaca Bay Project compellingly demonstrate that the project is consistent with DOE's public interest criteria.

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[39] *Id.* at p. 3.

[40] For example, as reported by the EIA, the average monthly Henry Hub spot price for natural gas in 2011 ranged from $3.17 to $4.54 per MMBtu (a change of $1.37 per MMBtu) and the average January Henry Hub spot price during the period 2008 to 2012 ranged from $2.67 to $7.99 per MMBtu (a change of $5.32 per MMBtu. http://www.eia.gov/dnav/ng/hist/rngwhhdm.htm (September 25, 2012).

[41] B&V Report at p. 8.

Promote Long-Term Stability in Natural Gas Markets

Lower U.S. natural gas prices have led to decreased capital spending on drilling and development activities.[42] Exporting natural gas would create increased demand for domestically produced gas, and would contribute to a small increase in domestic natural gas prices. Both of these factors would help encourage investment and would stabilize the natural gas industry.[43] Of broader importance is the stabilizing affect increased exports would have on both the price and availability of natural gas for domestic uses.

The stabilizing effects would stem from several causes;

First, simply by increasing the size and diversity of the demand for natural gas to include consumers in other nations, volatility in demand decreases, which will contribute to more stable prices in the U.S.

Second, a greater domestic production base and upgraded gas transmission capabilities present an opportunity for rapid, voluntary diversion of gas supply to domestic purposes should domestic demand change rapidly. Consider the possibilities if the U.S. were to have a catastrophic event at a U.S. nuclear plant, leading to the shutdown of a large portion of the U.S. nuclear generating fleet. In such a situation, an expanded U.S. natural gas industry could respond quickly through a global least cost solution. Exporters could chose to cancel export shipments and divert gas for use in domestic natural gas generating facilities, while foreign counter parties were made economically whole under the terms of their contracts. In contrast, a smaller U.S. natural gas industry would not have the option to redeploy foreign bound gas, and production and transportation capabilities would be more limited. Simply producing more gas immediately would not be an option and trying to expedite the drilling of new

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[42] See, *e.g.*, *The American Shale Gas Revolutions: Fundamental Winners and Losers*, by Marcus V. McGregor, in Asset Management Viewpoint, Volume 16, #2 (April 2012) (Noting: "Operators have been allocating more capital to exploration and production of liquids in order to mitigate the recent decline in natural gas spot prices ....) Available at https://www.conning.com/uploadedFiles/Asset_Management/Point_of_View/Viewpoint/04-2012%20Shale%20Gas%20Revolution%20FINAL.pdf as of September 26, 2012. Chesapeake Energy operated 100 natural gas rigs in January of 2010; as of August 2012 its rig counted was 10. Chesapeake Energy September 2012 Investor Presentation, available at http://www.chk.com/investors/documents/latest_ir_presentation.pdf as of September 26, 2012.

[43] In the February 2012 issue (Vol 233 No. 2) of World Oil Online James C. West, Anthony Walker, Zachary Sadow and Rachel Nabatoan of Barclays Capital reported on the results of a survey of 351 oil and gas operating companies. "Roughly 27% of companies surveyed plan on increasing spending [on natural gas exploration and production activities] if natural gas prices average $4.50/MMbtu in 2012, and 70% would do so if they average $5.00/MMbtu. Nearly half of surveyed companies would cut back spending if gas averaged $3.50/MMbtu, while $3.00/MMbtu was the most popular threshold for companies to reduce budgets." http://www.worldoil.com/February-2012-EP-spending-to-reach-record-600-billion.html, as of September 26, 2012.

wells on an emergency basis would increase the level of environmental risk. The only immediately available course of action would involve establishing a new short-term equilibrium in a domestic-only market with fewer options, leading to much higher prices and a greater potential for scarcity of natural gas for electricity generation.

Finally, in the natural gas industry, increased production moves production to a flatter part of the supply curve. Such a situation means that futures increases (or decreases) in demand of a given increment result in smaller change in price and increased amounts of available supply. In such an environment, both supply and prices are less volatile.

Benefits to Local, Regional and U.S. Economies

The construction and operation of the ELS Project will stimulate the local, regional, and national economies through job creation, increased economic activity and tax revenues. Much of the technology, equipment, and material needed to construct the ELS Project will be obtained from U.S. sources. Moreover, the national economy will benefit from the ELS Project's role in supporting the E&P value chain for natural gas extraction. This stimulus will have a profound multiplier effect due to the wages, taxes and lease payments involved in the natural gas supply chain.

The economic benefits of the ELS Project are broken down into the primary and secondary economic impacts of the construction and operation of the first phase of the ELS Project on the local project area, Texas, and the nation. [44]

Primary Economic Impacts

The ELS Project will provide a significant source of employment, economic activity and tax revenues to the regional and national economies. The estimated Phase 1 direct expenditures will be $1.36 billion with $319 million of that amount occurring within the "Primary Impact Area" (a defined region around the ELS Terminal). Additionally, $493 million will be spent outside of the Primary Impact Area in Texas, with the remaining $522 million spent nationally. [45]

[44] Black and Veatch Report, *supra* note 11.
[45] Black & Veatch Report, *supra* note 11, at section 6, page 1.
Estimates of the Construction and Operational Impacts on the Local, State, and US Economies

Secondary Economic Impacts

Other benefits of the ELS Project will not be limited to the primary impacts discussed above because the direct expenditures ripple through the economy. The primary impact area construction expenditures are estimated to account for more than $526 million in total production from all industries impacted by those expenditures (total economic output), and generate $17.2 million in state and local taxes, as well as $32.2 million in total federal tax revenues.[46] The operational impacts over the first 20 years are estimated to be $870 million (in 2012 dollars), generating $26 million in state and local taxes, and an additional $40 million in federal taxes.[47]

Estimated positive impacts for the U.S. as a whole are considerably greater. The ELS Project's construction related contribution to total economic output in the U.S. is projected to be nearly $3.32 billion, with tax revenues for state and local authorities of more than $154 million, and federal tax revenues of nearly $242 million.[48] Similarly, the ELS Project's operations related contribution to total economic output in the U.S. is estimated to exceed $2.04 billion, with state and local tax revenues in excess of $74 million and federal taxes of nearly $120 million[49]. As noted previously, these estimates are just for Phase 1. For the full project, the impacts will be roughly two-thirds greater.[50]

Jobs

Unemployment is a huge concern at present and both studies have shown the positive impact the ELS Project will have on the job market. Construction of Phase 1 of the Project is projected to support the employment of an average of 7,122 workers each year for three years.[51] The construction of Phase 2 would increase the total number of jobs created in certain years, as well as extend the period of job creation. A mix of skilled and unskilled labor would be required, resulting in an average labor income associated with each of these 7,122 jobs of $64,163.[52] The operation of the ELS Project is anticipated to result in the employment of an additional 696 workers each year over the entire life of the project.[53]

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[46] Id., at p. 6 [second page 6 in Section 6.2].
[47] Id., at p. 11 [second page 11 in Section 7.2].
[48] Id. at p. 7
[49] Id., at p. 12.
[50] Id. at p. 1.
[51] Id. at p. 2.
[52] Id. at p. 6 [second page 6 in Section 6.2]
[53] Id.

The average wages and benefits associated with the portion of these jobs falling in the Primary Impact Area are even higher than the construction related work -- $75,833/job.[54]

International Considerations

Recent world events, such as the continuing weakness of certain European Union economies, have served as ample reminders that the welfare of U.S. citizens is interdependent on the health of the world economy. In May 2012, the Brookings Institution's Energy Security Initiative released its Policy Brief 12-01 "Liquid Markets: Assessing the Case for U.S. Exports of Liquefied Natural Gas", by Charles Ebinger, Kevin Massy and Govinda Avasarala ("Brookings Study"), and in analyzing the international implications of LNG exports, the authors broke the subject down into three components: pricing, geopolitics, and the environment.

With respect to pricing, the Brookings Study observes: " LNG exports will help to sustain market liquidity in what looks to be an increasingly tight LNG market beyond 2015."[55] Looser or more liquid markets help place downward pressure on the pricing terms of oil-linked contracts, which are common in the world markets for LNG. This has resulted, in the renegotiation of some contracts, particularly in Europe.[56] Lower prices for energy in Europe and elsewhere can contribute to an uptick in the world economy, fueling increased trade with the U.S.

With respect to geopolitics, the Brookings Study concludes: "A large increase in U.S. LNG exports would have the potential to increase U.S. foreign policy interests in both the Atlantic and Pacific basins."[57] "The addition of a large, market-based producer [*i.e.*, the U.S.] will indirectly serve to increase gas supply diversity in Europe, thereby providing European consumers with increased flexibility and market power. … Increased LNG exports will provide similar assistance to strategic U.S. allies in the Pacific Basin. By adding supply volumes to the global LNG market, the U.S. will help Japan, Korea, India, and other import-dependent countries in South and East Asia to meet their energy needs. … As U.S. foreign policy undergoes a 'pivot to Asia,' the ability of the U.S. to provide a degree

[54] Id. Operational jobs associated with the ELS Project over the entirety of the U.S. have a similar per job value of $71,840.
[55] Brookings Study at p. 39.
[56] Id. at p. 38.
[57] Id. at p. 41.

of increased energy security and pricing relief to LNG importers in the region will be an important economic and strategic asset."[58]

Finally, as to the environment, the Brooking Study states:

> "According to the [International Energy Agency], natural gas in general has the potential to reduce carbon dioxide emissions by 740 million tonnes in 2035, nearly half of which could be achieved by the displacement of coal in China's power-generation portfolio. Natural gas—in the form of LNG—also has the potential to displace more carbon-intensive fuels in other major energy users, including across the EU and in Japan, which is being forced to burn more coal and oil-based fuels to make up for the nuclear generation capacity lost in the wake of the Fukushima disaster. In addition to its relatively lower carbon-dioxide footprint, natural gas produces lower emissions of pollutants such as sulfur dioxide nitrogen oxide and other particulates than coal and oil."[59]

The Brookings Study also notes that some have expressed concern that lower gas prices may lead to increased carbon dioxide emissions due to the displacement of nuclear and renewable energy by cheap natural gas.[60] ELS asserts that such concerns are misplaced. First, as the Brookings Study concludes, export of U.S. natural gas would not have a substantial impact on the need for other energy sources to generate electricity.[61] Second, U.S. LNG exports are driven by the price differential between the destination markets and the U.S. natural gas market. Destination markets must command a significant price premium in order to cover the cost of liquefaction, transportation and regasification. Such considerations all favor the use of nuclear and renewable energy sources overseas relative to their competitiveness against natural gas in the U.S. Moreover, any tendency on the part of LNG exports to raise the cost of U.S domestic gas supplies not only tends to reduce the volume of exports, it also contributes to the increased use of alternative forms of generation in the U.S., making nuclear and renewable energy more affordable. Thus, any loss of competitiveness of such generating technologies

[58] Id. at p. 43.
[59] Id. at p. 44.
[60] Id.
[61] Id.

abroad would be at least partially mitigated by increased competitiveness of these technologies in the U.S.

There is yet another area in which exports of LNG will be beneficial to the U.S. The export of LNG from the U.S. directly improves the U.S. balance of trade:

> "Even at a market natural gas price of $3/MmBtu and 80 percent utilization, the project will result in added exports in the range of $1.35 billion each year when including a tolling and project pipeline transport fee of approximately $3.5/MmBtu. This annual impact increases to approximately $1.78 billion at a natural gas price of $5/MmBtu and approximately $2.2 billion at a market price of $7/MmBtu."[62]

Conclusion

The overall outlook for domestic natural gas production is promising. The rapid growth of natural gas supplies in South Texas and nationally has driven the discussions regarding the export of LNG. Without a significant increase in U.S. residential, commercial and industrial demand, the current rate of consumption is not enough to offset growth in production, and may contribute to sustained low prices for natural gas in the U.S. This rapid growth, without increased demand, is already resulting in decreased investment by the natural gas industry and a reduction in associated economic activity. Low wellhead prices have also encouraged increased flaring of natural gas that otherwise could have been economically recovered. It is our belief that the export of domestically produced LNG represents a market driven path toward deploying the country's vast energy reserves in a manner that meaningfully contributes to the public interest in a variety of ways:

- More jobs, greater tax revenues, and increased economic activity;
- New competitive supplies introduced into world gas markets, leading to improved economies among America's trading partners, and providing better opportunities to market U.S. products and services abroad;
- Greater national security through a larger role in international energy markets, assisting our allies, and reducing dependence on foreign oil through co-production of oil and natural gas liquids that might otherwise be uneconomic;

[62] B&V Report at p. 17 [Second p. 17, Section 7]

- Increased production capacity able to better adjust to varying domestic demand scenarios;
- Less volatile domestic natural gas prices;
- Improved U.S. balance of payments by between $2.4 billion and $4.4 billion annually per terminal through the export of natural gas and the displacement of imports of other petroleum liquids;[63] and
- Increased economic trade and ties with foreign trading partners and hemispheric allies, and displacement of environmentally damaging fuels in those countries.

[63] B&V Report at 12 (based on $1.2 - 2.2 billion for Phase I alone, exporting 4 MPTA). Other studies have found even greater benefits for individual LNG export terminals. B&V Report at 14-15.

Mr. POE. Dr. Montgomery, you have 5 minutes, please.

STATEMENT OF W. DAVID MONTGOMERY, PH.D., SENIOR VICE PRESIDENT, NATIONAL ECONOMIC RESEARCH ASSOCIATES

Mr. MONTGOMERY. Thank you, Mr. Chairman. I am honored by your invitation to appear before the committee today. My name is David Montgomery, and I am the senior vice president of NERA Economic Consulting, and I would like to start by stating that I am speaking on my own behalf today.

Mr. POE. Is your microphone on, Dr. Montgomery?

Mr. MONTGOMERY. It is not, thank you. I am sorry. I am senior vice president of NERA Economic Consulting, and I would like to start by stating that I am speaking on my own behalf as an expert on the issues being discussed by the committee today, and not representing positions taken by my employer NERA, and I am certainly not speaking for the Department of Energy.

I would like to begin with a quick summary of the key findings of our study that we did for the Department of Energy, and I will talk about economic principles and not numbers at this point. Then I will address some of the controversies that have arisen since the study was issued, and then I would like to conclude with a few observations on geopolitical effects of LNG exports.

In the study we did for the Department of Energy, we examined a wide range of scenarios for export levels. We had different assumptions in these scenarios about the costs and availability of natural gas in the United States, and also on levels of global demand, and the supply from competing sources in the world market. We found that in some cases the U.S. might not export gas at all, as Mr. Sherman suspected. But in those cases, allowing exports had no effect; they did no harm and did no good.

In all of the scenarios in which the U.S. did export, we found that there were net benefits to the U.S. economy from those exports. The larger the exports were, the greater the benefits were. Limiting exports never produced greater benefits in any of the scenarios we looked at than unlimited exports. This shouldn't be surprising or controversial. It is exactly what the basic principle of comparative advantage that underlies all of international trade theory says will happen. All countries are better off when they specialize in exporting what they are good at, rather, what they are better at, and importing what others are better at producing.

We wanted to be sure of our ground. We asked one of the leading trade economists in the country, Professor James Markusen at the University of Colorado, to advise us on this work and to review the study. He concurred in these conclusions as did studies that were released by the Brookings Institution, and by Rice University. They all apply essentially the same principles of international trade theory and reached the same conclusion about net benefits.

Another way of putting this is that the advent of shale gas creates a new opportunity, and it changes the nature of the United States' comparative advantage in trade. That produces some changes in patterns of imports and exports and industry outlook. But we have never found that shutting off opportunities or preventing change increases national wealth. It works the other way around.

So let me talk a little bit about prices. Since the world won't buy gas from the United States if it costs more than the natural gas that they can get from other sources, there are limits on how large the price increase caused by LNG exports could be. In most of the scenarios that we looked at, U.S. prices increased by about $0.50 and that is looking out to, say, 2025 and it is on a base forecast of $6 of what natural gas prices would go back up to even if we had no LNG exports.

In some cases, at most, we had $1 as the increase in cost that would be attributable to gas exports. In other words, with abundant gas, we can supply ourselves and export gas, and with limited supplies of gas, we can't do either. But even with the largest price increases, U.S. energy-intensive industries will still be getting natural gas for half the cost of their competitors in natural gas-importing industries. That is because the cost of moving gas from where it is produced in the United States to where it is burned in countries like Japan, Korea, China, or even Europe, just about doubles the U.S. wellhead price. So I mentioned some of the importing countries.

I can't believe that the U.S. chemicals industries, for example, is so inefficient that it can't survive if these competitors are still paying twice as much for natural gas as it is even after we are exporting natural gas. U.S. energy-intensive industries no matter what we export of LNG will still be getting natural gas at perhaps half the cost of the competitors that we worry about, like China, Europe, and Japan.

Overall, the benefits of LNG exports that we found in our study were clear, but they weren't large. And this is instructive. The U.S. is not going to become a one-crop economy. Natural gas is not a large part of the U.S. economy. Natural gas exports won't be a large part of U.S. exports. And I think this is helpful in understanding that the U.S. is not going to become a country like a small African country that is exporting copper and is swung back and forth by commodity markets. This is one part of a large portfolio. Let me see, I am running very short on time, so let me make several other points I would like to cover.

Mr. POE. Dr. Montgomery, if you would, summarize and then end your statement and then we will file your statement with the record. We have some questions for you, too.

Mr. MONTGOMERY. I will, yeah. I agree with the chairman, LNG exports will help our friends and limit Russia's ability to extract higher prices. I think they will distribute to nonproliferation goals as well as energy security because of the countries like India that need the exports. I don't believe the LNG exports will increase local CO2 emissions. If the gas is burned elsewhere, it will substitute for coal and it is pretty much awash. But mainly my points is, limits will be self-defeating. Free trade areas will receive gas. Canada is a free trade area. If we have abundant gas and don't export it ourselves as LNG, it will move to Canada, and that gas will displace Canadian gas which then can be exported. We will suffer all of the costs of exporting natural gas and get none of the benefits of selling it at the high price as a nation. Thank you, Mr. Chairman, I appreciate your indulgence.

Mr. POE. Thank you, Dr. Montgomery.

[The prepared statement of Mr. Montgomery follows:]

Prepared Testimony of
W. David Montgomery, Ph.D.
Submitted to the
Committee on Foreign Affairs
Subcommittee on Terrorism, Nonproliferation, and Trade
United States House of Representatives
Natural Gas Exports: Economic and Geopolitical Opportunities
April 25, 2013

Mr. Chairman and Members of the Subcommittee:

I am honored by your invitation to testify on the economic benefits of free trade in natural gas. I am an economist and Senior Vice President of NERA Economic Consulting. I had the privilege of leading the study of the "Macroeconomic Impacts of U.S. LNG Exports" that was issued by the Department of Energy in December 2012.[1] This was one of the most gratifying experiences of a very long career in policy analysis. I worked with a great team at NERA that developed the model of the U.S. economy and the model of world natural gas markets on which the study was based. I appreciate them but I have that privilege every day. What made this a unique experience was the quality, thoughtfulness, and open-mindedness of the people we worked for in the Department of Energy. They asked us for an objective and independent study and they published exactly what we wrote without spin or alteration.

Statements in this testimony represent my own opinions and conclusions and do not necessarily represent opinions of any other consultant at NERA or any of its clients. I do not speak for the Department of Energy, in particular, but only for myself.

[1] Available at: http://www.fossil.energy.gov/programs/gasregulation/reports/nera_lng_report.pdf

Major Findings of the Macroeconomic Study

I will start with a quick summary of the findings of the NERA study, taken largely from what I think was a rather good executive summary.

Across all the scenarios that we examined in which the global market would take exports from the U.S, there were net economic benefits to the U.S. from allowing LNG exports. Moreover, for every one of the market scenarios examined, net economic benefits increased as the level of LNG exports increased. In particular, scenarios with unlimited exports always had higher net economic benefits than corresponding cases with limited exports. There was no "sweet spot," and no point where any "balance" was required to gain the greatest benefits. [2]

In all of these cases, benefits that come from export expansion would more than outweigh the costs of faster increases in natural gas production and slower growth in natural gas demand, so that LNG exports have net economic benefits in spite of higher domestic natural gas prices. This is exactly the outcome that economic theory describes when barriers to trade are removed.

Net benefits to the U.S. would be highest if the U.S. becomes able to produce large quantities of gas from shale at low cost, if world demand for natural gas increases rapidly, and if LNG supplies from other regions are limited. If the promise of shale gas is not fulfilled and costs of producing gas in the U.S. rise substantially, or if there are ample supplies of LNG from other

[2] A Brookings Institution study released in May 2012 reached the same conclusion as the NERA Study that LNG exports would be a net benefit to the US economy. The Brookings study stated "LNG exports are likely to be a net benefit to the U.S. economy, although probably not a significant contributor in terms of total U.S. GDP. Exports of U.S. natural gas will take advantage of the benefits of the existing producer's surplus resulting from the pricing differentials between the natural gas markets in the United States, Europe, and Asia.... The benefit of this trade will likely outweigh the cost to domestic consumers of the increase in the price of natural gas as most of the natural gas demanded by exports will come from new natural gas production as opposed to displacing existing production from domestic consumers." Charles Ebinger, Kevin Passy, Govinda Avasaral, "Liquid Markets: Assessing the Case for U.S. Exports of Liquefied Natural Gas," Energy Security Initiative at Brookings, May 2012, Policy Brief 12-01, pages 36-37. Available at: http://www.brookings.edu/research/reports/2012/05/02-lng-exports-ebinger.

regions to satisfy world demand, the U.S. would not export LNG. Under these conditions, allowing exports of LNG would cause no change in natural gas prices and do no harm to the overall economy.

U.S. natural gas prices increase when the U.S. exports LNG. But the global market limits how high U.S. natural gas prices can raise under pressure of LNG exports because importers will not purchase U.S. exports if U.S. wellhead price rises above the cost of competing supplies. In particular, the U.S. natural gas price does not become linked to oil prices in any of the cases examined.

Natural gas price changes attributable to LNG exports remain in a relatively narrow range across the entire range of scenarios. Natural gas price increases at the time LNG exports could begin range from zero to $0.33 (2010$/Mcf). The largest price increases that would be observed after 5 more years of potentially growing exports could range from $0.22 to $1.11 (2010$/Mcf). The higher end of the range is reached only under conditions of ample U.S. supplies and low domestic natural gas prices, with smaller price increases when U.S. supplies are more costly and domestic prices higher.

I would like to comment at this point on the findings of the report about resource rents versus changes in capital income and wages. To be very conservative in our analysis, so that any findings about net economic benefits would be as robust as possible, we attributed all the increased income associated with natural gas exports to owners of natural gas resources. But natural gas in the ground is not the only factor of production required to produce and export additional natural gas. Some of what we called resource income would go to workers with the specialized skills required in natural gas exploration and production, and in infrastructure and

liquefaction facility construction, in the form of higher hourly wages. Some would go to existing investors in businesses that explore for, produce and transport natural gas, and more broadly to firms that build the facilities needed for expanding the natural gas industry. If we had included these wage increases and higher investment returns it could well have turned out that there was no loss in labor income or the average return on capital, and still a net overall economic benefit.

Basic principles of the economics of international trade make this conclusion inescapable

There should be nothing surprising about the conclusion that the U.S. economy is better off with unrestricted trade in natural gas than with any restrictions. The same specific conclusion is reached in recent studies by Charles Ebinger of the Brookings Institution and Kenneth Medlock of Rice University, despite many differences in details of the level of exports and price impacts.[3] It is also the logical consequence of the basic economic theory of international trade. The economics of international trade are based on the principle of comparative advantage. This principle states that free trade countries will tend to export those goods and services which they are better at producing and will import those that others are better at producing. Extensive and rigorous theoretical analysis and also on observation of economic progress during periods of free trade and periods with major trade restrictions support the finding that free trade leads more robust economic growth.

There are of course some conditions. The major one that matters in this debate is whether a

[3] Charles Ebinger, Kevin Passy, Govinda Avasaral "Liquid Markets: Assessing the Case for U.S. Exports of Liquefied Natural Gas," Energy Security Initiative at Brookings, May 2012, Policy Brief 12-01. Available at: http://www.brookings.edu/research/reports/2012/05/02-lng-exports-ebinger, and Kenneth B. Medlock III, PH.D., "U.S. LNG Exports: Truth and Consequence," James A. Baker III Institute for Public Policy, Rice University, August 10, 2012.

country is subsidizing exports – as China is frequently accused of doing. LNG exports from the United States do not need government subsidies to be desired by just about every country that is now importing natural gas – natural gas has become so cheap in the United States because of the investment and technical knowhow of our oil and gas industry, which has made previously unusable natural gas resources economic to produce in abundant quantities. Under these conditions, economic theory and practical experience clearly support the conclusion that free trade in natural gas is better for the U.S. economy than any system that restricts natural gas exports.

The textbook exposition of this point is based on a fairly simple diagram or two. To explain the general economic theory of trade it is useful to begin with a simple illustration of the natural gas market with a closed economy where no trade exists. Consumers and producers interact in the natural gas market with demand and supply establishing a market equilibrium that determines the market price and quantity exchanged.

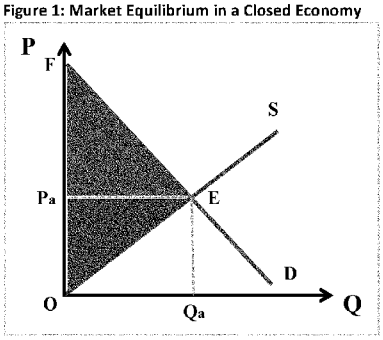
Figure 1 shows a supply and demand diagram where demand for natural gas is represented by a downward-sloping line, D, characterizing decreasing willingness to pay as consumption increases, and supply by an upward-sloping line, S, characterizing increasing marginal cost of production as output increases. For illustrative convenience, we employ straight lines for demand and supply.[4]

Demand and supply cross at point E, which denotes market equilibrium or competitive

[4] Iso-elastic curves characterize demand and supply more realistically. There is always some demand when price is low and marginal cost grows at increasing rate.

equilibrium. At the competitive equilibrium, consumers' willingness to pay is equivalent to producers' cost of production. Neither side of the equilibrium is stable. Producers incur losses if they choose to produce additional output, which costs more than consumers' willingness to pay; to the left of the equilibrium, producers can earn more on additional output given that consumers are willing to pay more than what it costs to produce. Therefore, the market stabilizes at the equilibrium with associated equilibrium price P_a and quantity Q_a.

Figure 1: Market Equilibrium in a Closed Economy



Economic surplus refers to monetary gains or "welfare." Consumer surplus denotes the value consumers receive from consumption for which they did not pay. Graphically, this is the red triangle in

Figure 1 which sits above the price and below the demand line. Likewise, producer surplus represents the value producers gain in excess of the cost of production. The area below the price and above the supply line (blue triangle) in

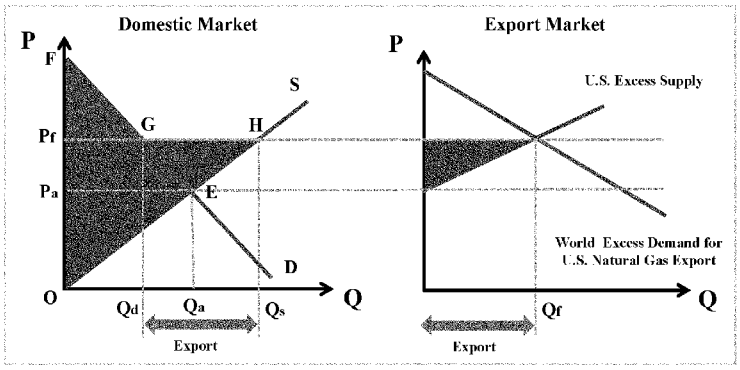
Figure 1 denotes the producer surplus. Total surplus or social welfare is the sum of consumer surplus and producer surplus. Social welfare should also include tax revenue or quota rent, if any is involved.

Free trade equates domestic prices with world prices. When an economy has a comparative advantage and thus can produce at a lower cost than the rest of the world, moving from a no trade to a free trade position implies an increase in domestic price. Analogously, the domestic price falls when the country becomes an importer and substitutes more costly domestic production with cheaper imports.

For the case of U.S. natural gas industry, we include a diagram for the export market along with the one for the domestic market to illustrate the changes when the U.S. moves from a no trade to a free trade position (see

Figure 2). The export market is represented by the U.S. excess supply of natural gas and the world excess demand for the U.S. natural gas export. The competitive equilibrium in the export market finds a price (P_f) that equates the world excess demand with the U.S. excess supply and at which the excess supply, the amount of natural gas U.S. producers are willing to produce in excess of the amount of domestic consumption ($Q_s - Q_d$), is equal to the equilibrium export in the export market (Q_f).

Figure 2 : Market Equilibrium with Free Trade



Social surplus changes along with the price movement. When a country becomes an exporter, a domestic price increase reduces domestic consumption, resulting in a loss of consumer surplus. In the domestic market diagram of

Figure 2, consumer surplus shrinks from P_aEF to P_fGF. Producers receive more profit on every unit of output sold to both the domestic and world market, generating a gain in producer surplus, which not only offsets the loss in consumer surplus (the trapezoid P_aEGP_f) but also adds a net gain on each unit sold to the world market (the triangle EHG). From the social welfare perspective, part of consumer surplus transfers to producer surplus and producers gain more profits from exporting. It is worth noting that the net gain, shown as the triangle EHG in the domestic market diagram, is equivalent to the blue triangle in the export market diagram that represents the gain to exporters. It is earned by producers who are able to export and obtain a higher netback price than would be available in the domestic market without exports. These references to producers, consumers and exporters, by the way, should not be taken to imply that these are distinct people – as the NERA report discussed at length, through stock ownership both producers and exporters contribute to the income of households (not to mention paying taxes).

A Natural Gas Theory of Value

The loud dissent from this basic principle that has been heard since December repeats an old and repeatedly exploded economic fallacy. For example, a recent study commissioned by the leading opponent of free trade in natural gas claims that every Btu of natural gas used to manufacture basic chemicals generates 8 times the GDP that is generated by exporting that same amount of natural gas. This is completely bogus, and is so far off base that any refutation sounds like lecturing to first year economics students. So here it goes. Value added in manufacturing is created by the labor and capital at work in the industry, not by physical inputs like natural gas. The value of natural gas is fully captured by the willingness of customers to purchase the natural gas – and if overseas purchasers are willing to pay more for natural gas than domestic producers from whom some gas might be bid away, then clearly natural gas generates more value as an export than when used domestically. That is the basis for NERA's conclusions, and it is true whether or not there was some revolutionary change in the structure of industry over the past few years.

If, indeed, it were only possible to produce enough natural gas to meet domestic needs and natural gas were more valuable here than abroad, then there would be no exports even under free trade because foreign buyers would be unable to bid it away from U.S. suppliers. This is in fact one of the scenarios we discussed in the NERA report for DOE – the reference case for global demand combined with low EUR (e.g. low estimated ultimate recovery of natural gas) from EIA's scenario for U.S. supply. Exports of LNG did not cause higher prices or problems for the chemicals industry in this scenario, because there were none. However, because of limited supply, natural gas prices were much higher and more threatening to the chemicals industry than

they would be in scenarios with ample supply and free trade. In such cases, there was ample gas for both exports and the chemicals industry at reasonable prices.

The claim that more GDP will be lost in chemical manufacturing than gained from natural gas exports is based on the fallacy that every Btu of gas that is exported will be taken away from the chemicals industry, and that there is a fixed proportion between chemicals output and natural gas input. Neither is true but both types of claims have been made by Cassandras of disastrous shortages since at least the 1950s, where my knowledge of the subject begins. We called this in the 1970s the "energy theory of value," that there was a fixed, lockstep proportion between energy use and GDP. This led to numerous predictions of the collapse of Western Civilization when energy ran out, as the Club of Rome and others were sure it would. Yet somehow we now consume only a fraction of the energy per dollar of GDP that was needed in 1970 and we have more goods and more energy.

Another way to see the fallacy of the proposition that trade in basic materials like natural gas should be restricted in order to provide cheap feedstocks for downstream industries is by asking which downstream industry should be allowed to export freely? Chemicals are intermediate goods – made with natural gas as one component but then used in several subsequent manufacturing steps to make plastics, manufactured goods, and then consumer products like cars, computers, and houses. Since some of those final goods have far greater value added per Btu of natural gas used, why should not trade in all intermediate goods be restricted to maximize the GDP produced by natural gas? The answer is not that there is a sweet spot, but that all restrictions on exports of natural gas will prevent natural gas from reaching its highest valued use and deprive the U.S. economy of the benefits of using its resources in the most advantageous way for the people of the United States.

Trade Restriction is Self-Defeating

The Department of Energy has authority to withhold permission only for exports to countries with which the U.S. does not have a free trade agreement. Canada and Korea are two countries with which we do have free trade agreements, and that fact implies that the only effect of restricting exports to non-Free Trade Area countries will be that the U.S. will bear all the costs of doing so but get none of the benefits. In particular, Canada has just authorized a major LNG export facility in British Columbia and both the Federal and Provincial governments are firmly behind exports. There is no restriction on exports of natural gas to Canada, and existing pipelines could be reversed to take shale gas from the U.S. to Eastern Canada. If the U.S. is successful in producing cheap and plentiful natural gas but prohibits LNG exports to non-FTA countries, a most likely outcome is that Canada will ship its domestically produced natural gas west by pipeline and export it to the coveted Asian markets, and import natural gas from the U.S. for its domestic use. This will drive up the price of natural gas in the U.S. just as much as would free LNG exports, but the U.S. will get none of trade advantages of participation in the profits from selling to the higher valued market in Asia.

Korea's discussion of the possibility of creating an Asian hub for LNG trade also suggests that U.S. exports to Korea could through displacement and transshipment also meet a much larger market, with little benefit to the U.S. from the high prices at which it might be sold in Asia.

The administrative nightmare that any attempt to restrict trade would cause should also be seen as a self-defeating outcome for the nation as a whole, if not for the specific industries that would benefit from restricting the ability of their suppliers to sell to higher valued uses. Even if a limit

is intended to be non-binding, it will still be necessary for DOE to devise some method of deciding which applicant should get a permit, thus substituting administrative action that will encourage rent-seeking behavior and political influence on the process that has not yet warped outcomes. The result of using administrative action as a substitute for the due diligence of private investors has become quite clear in the failures of the DOE loan guarantee programs. Based on this history, administrative allocation of export licenses would likely lead to politically-significant developers getting permits even if they could not pass scrutiny by private sector investors, leading in turn to project failures, wasted resources, and sacrifice of even the export opportunities that are allowed as U.S export capacity falls further and further behind our competitors for the world LNG market.

Exaggerations

Four claims made in opposition to free trade in natural gas are based on gross exaggerations of potential impacts. I address each of the four in turn:

1. The US will not have exports equal to 25 – 50% of domestic natural gas use in the near future

As DOE officials themselves explain, it is easy to apply to DOE for a license and necessary to have one in order to start the approval process at the FERC. But only three projects have officially begun the FERC process, and no expert familiar with the industry expects even a small fraction of the total capacity that has made application to DOE will be built in the next decade. It is an exaggeration that ignores the role of the market to talk about exports on the scale of 25 to

50% of domestic demand by 2030.

2. U.S. prices will not rise to levels now seen in Asian markets, or even to the netback price based on current prices in Asian markets

First, there will always be a difference of $6 to $8 between Asian prices and U.S. prices, since that represents the cost of inland transportation, liquefying, shipping, and regasifying natural gas to get it from the U.S. to Japan or Korea. Asian buyers have no incentive to buy gas in the U.S. if it is not cheaper than their prevailing domestic price by that amount.

Assuming that current, larger LNG pricing differentials will persist in a world in which LNG exports increase at a rapid rate ignores everything we know about supply and demand, and is the fallacy that has led to the demise of many bubbles of energy investment. Increasing LNG exports will exert a downward pressure on Asian prices and raise prices in exporting countries, so that the current premium that Asian buyers now pay is likely to be unsustainable. But even then, prices in exporting countries will be lower than in importing countries by the cost of liquefaction, shipping and regasification. NERA's analysis used a comprehensive model of global natural gas supply and demand to investigate many scenarios for how much LNG could be exported by the U.S. and how the netback to the U.S. would vary with the level of exports. Many competing suppliers are better positioned to serve growing LNG demand in Asia than the United States, and the prices they offer in the future in response to market competition will determine U.S. netbacks. These are the effects that NERA's analysis captures and that are ignored by any comparison to current Asian pricing.

3. Growth of the chemical industry and manufacturing as a whole will not end because of increases in natural gas prices that might be attributable to market-determined levels of

LNG exports

Economists who analyze how changes in energy costs affect energy-intensive, trade-exposed industries have reached a consensus that only narrowly-defined segments of manufacturing are at risk from higher energy costs. These sectors have relatively small employment and value added compared to manufacturing as a whole, so that even large impacts on these narrow segments translate into negligible impacts on manufacturing and the U.S. economy as a whole. The only chemical sector that is held out as evidence of widespread harm from higher natural gas prices is the nitrogenous fertilizer industry, which according to the Census Bureau employed about 4000 workers in 2007.[5] This subsector of chemicals is not typical of the chemicals sector as a whole, it is a unique outlier based on turning cheap natural gas into cheap fertilizer with low profit margins and little significance for the overall economy. It has experienced ups and downs in the past as natural gas prices rose and fell, with no detectable benefit to the rest of the economy when it grew or harm when it declined.

Moreover, claims of the vulnerability of any chemical sector to increased U.S. prices appear to ignore the fact that even with unrestricted trade, U.S. natural gas prices will be lower than in countries that must import natural gas, including Europe, China, India and other Asian economies. The basis differential that will be sustained by the cost of transportation, liquefaction and regasification of LNG will maintain a clear natural gas price advantage for U.S. chemical manufacturers over these competitors.

As to manufacturing as a whole, as prior NERA studies have shown, the real threat for manufacturing is growing government regulation, of which export restrictions would be another

[5] See http://www.census.gov/econ/industry/hierarchy/i325311.htm

added burden. The one thing about LNG exports that is certain is that they will grow slowly due to the timelines for financing and constructing highly capital-intensive liquefaction terminals, and the only impact that LNG exports could have would be a small change in the rate at which manufacturing expands. With the possible exception of a very small slice of the chemical industry, there is no chance that LNG exports could turn robust manufacturing growth into decline.

4. NERA's use of AEO 2011 forecasts does not invalidate its findings of net benefits for the U.S. economy.

The current natural gas outlook has changed dramatically for the better since 2011. According to the U.S. Energy Information Administration's current projection, in every future year more natural gas will be available for the same price than it projected in its 2011 forecast. Our analyses show clearly that net benefits to the U.S. would be larger if more natural gas were available for domestic use at the same level of LNG exports. Hence, if we used the current EIA projections which include greater natural gas supply at every price, we would find even larger net benefits.

Natural gas price risks

The scenarios examined in the NERA report that yielded high natural gas prices even without exports remind us that natural gas prices have been volatile and will remain uncertain even under the most restrictive export policy. However, the one thing that we should have learned over the past three decades is that except for localized problems (like the lack of capacity to ship gas to California in 2000) there will not be generalized natural gas shortages. The flip side of price

volatility is that markets have the flexibility to respond to and eliminate potential shortages, and that curtailments have not been necessary since we eliminated regulation of the wellhead price of natural gas in the 1980s.

Thus even firm all-events contracts to supply natural gas to foreign buyers are not at all likely to produce natural gas shortages in the U.S., even if some groups are successful in their efforts to prevent use of our immense shale gas resources. If U.S. prices rise due to shortages of natural gas, it will become more profitable for those foreign buyers to resell their contracted gas in the U.S. market than to liquefy and export it. Thus producing natural gas for export in periods of low natural gas prices in the U.S. will provide a natural buffer against domestic supply shortages, and the more gas is exported in normal times, the more production capacity there will be for domestic needs.

Thus, natural gas price uncertainty will remain under all circumstances, and is as likely to be increased as to be decreased by banning LNG exports. Indeed, comparing scenarios with no LNG exports but restricted supplies of shale gas to scenarios with no LNG exports but plentiful supplies of natural gas reveals that restricting shale gas production could raise domestic natural gas prices by over $3/MMbtu in 2025, while the largest difference that LNG exports could make is one-third of that amount, or about $1/MMbtu.

Prudent investors will consider all the scenarios for how natural gas prices might evolve in evaluating investments in any project whose economics are sensitive to natural gas prices. Fortunately, these investors have the same opportunities to hedge price risks and obtain firm supply commitments as do purchasers of natural gas for export.

Geopolitical Issues

In addition to the economic benefits to the United States from exports of natural gas, there are a number of potential geopolitical benefits that were not covered in the NERA study.

1. A policy of unlimited U.S. LNG exports would limit Russia's ability to raise natural gas prices to Europe by creating a credible alternative supply that would defeat any attempt by Russia to raise prices above the landed cost of LNG. In contrast, if the U.S. limits exports it will send a signal to Russia that it can raise prices without fear of effective competition from the exporter most favorable located to undercut its prices to Europe.
2. LNG exports to India and other energy-poor countries considering nuclear power could contribute to non-proliferation goals by providing them with a more economical source of energy than nuclear power. Denying LNG exports to countries that have a choice between natural gas and nuclear power would weaken U.S. efforts to limit the spread of nuclear capability.
3. LNG exports could potentially contribute toward reducing global emissions by allowing coal intensive economies to use less carbon content fuel (natural gas) instead of high coal, a high carbon content fuel without impeding their economic growth. Availability of natural gas for the emerging economies increases their willingness to support a global policy on climate change. Moreover, modeling done by my team of global climate policies invariably shows that more flexible markets reduce the cost of meeting global concentration targets.
4. Restrictions on LNG exports would undermine the credibility of the position in support of free trade taken by the U.S. in controversies over limits placed on exports to the U.S.

by other countries, including oil from OPEC and strategic minerals from China.

Need for Additional Analysis

Some commenters on the NERA study suggested the need for updated or expanded analysis. Therefore I would like to offer my thoughts on developments and data since the NERA study was completed.

First, newer information suggests that the NERA study probably underestimated the net benefits to the U.S. economy from LNG exports. The outlook for U.S. natural gas supply found in EIA's 2013 Annual Energy Outlook is significantly more bullish than it was in 2011, and also implies that increased supplies with be forthcoming with smaller price increases than found in the 2011 report. If NERA's assumptions for U.S. natural gas supply had been based on the 2013 AEO, estimated impacts of LNG exports on U.S. natural gas prices would most likely have been quite a bit smaller and net benefits to the U.S. economy correspondingly larger. The same would be true if the NERA study were to adopt supply assumptions more like those used in studies by Professor Medlock and Deloitte.[6]

Second, U.S. companies appear to be taking more interest in the downstream value chain than was assumed in the NERA study. Every dollar earned by U.S. companies from shipping LNG to overseas locations and marketing natural gas in importing countries would increase net benefits to the U.S. economy relative to what NERA estimated. In the NERA study we estimated that if U.S. companies take the risks associated with merchant ownership of liquefaction capacity and marketing natural gas worldwide, the net benefits to the U.S. economy could be tripled.

[6] Medlock, *op. cit.* and Made in America: The Economic Impact of LNG Exports from the United States: A report by the Deloitte Center for Energy Solutions and Deloitte MarketPoint LLC. Available at: http://www.deloitte.com/view/en_US/us/Services/consulting/9f70dd1cc9324310VgnVCM1000001a56f00aRCRD.htm

Finally, there is always something to learn from continued analysis, but I do not believe that newer data or refinement of the calculations will change the qualitative conclusion that LNG exports provide net benefits to the U.S. economy. We know from basic economic principles of comparative advantage that free trade in natural gas will provide greater net benefits to the U.S. economy than trade restrictions designed to benefit a narrow slice of industries. By incorporating both trade benefits and the domestic costs of making gas available for export, the NERA study confirms this expectation.[7] Updating data and further disaggregating industry impacts will not change this conclusion, though it may show that the net benefits are larger and more widely distributed than the conservative approach we took in the study implied.

[7] The one actual modeling study that reached a different qualitative conclusion, by Dr. Wallace Tyner of Purdue University, used a model (Markal-MACRO) that includes all the domestic costs of increasing natural gas supply and slowing growth in demand but none of the trade benefits of selling natural gas to foreign purchasers at elevated market prices and obtaining increased quantities of imports as a result. Thus it naturally found a reduction in GDP, since the sources of increased GDP and net improvement in economic welfare were left out.

Mr. POE. Dr. Levi.

STATEMENT OF MICHAEL A. LEVI, PH.D., DIRECTOR, PROGRAM ON ENERGY SECURITY AND CLIMATE CHANGE, COUNCIL ON FOREIGN RELATIONS

Mr. LEVI. Chairman Poe, Ranking Member Sherman, members of the subcommittee, thank you for inviting me to speak with you about the geopolitical implications of U.S. LNG exports. As you know, in order to export LNG to countries with which the United States does not have a special Free Trade Agreement, companies must be granted permits by the Department of Energy. Approving some or all of those permits would benefit U.S. economic and security relationships. The United States has long been a promoter of open international energy markets as a way of separating commerce from diplomatic intrigue. In particular, in recent years it has challenged Chinese restrictions on exports of various raw materials at the World Trade Organization. A U.S. decision to disallow LNG exports would undermine Washington's strength when challenging Beijing and when promoting open markets more generally.

Some have gone further and argued that the United States should abolish even the current permitting process for LNG exports. Doing this, however, would remove valuable U.S. leverage in international trade negotiations. Maintaining some limited uncertainty about U.S. openness to exports, does create useful incentives for other countries to enter Free Trade Agreements with the United States.

Now, what would actually happen if the Department of Energy approved a substantial number of export permits? It is entirely possible that few or no export facilities would ultimately be built and used. Export facilities cost several billion dollars each and take years to build, and their economics only work if gas prices stay well below overseas ones. Many analysts, nonetheless, project that small but nontrivial volumes of U.S. natural gas will be exported. Those exports would give large LNG buyers, including Korea, Japan, and India, an alternative to Middle Eastern and other producers for part of their supplies. That would provide those countries some leverage in negotiations with the traditional suppliers, who have long insisted on rigid contracts that link the price of natural gas to the price of oil and that entangled gas trade with international relations as a result.

It would also provide them with some protection from economic damage that can result from volatile prices. It is unlikely, however, that U.S. LNG exports alone will fundamentally transform the highly politicized world of natural gas trade.

The prospect of U.S. LNG exports would also help Europe maintain leverage against Russia, even if, as it appears likely, little U.S. natural gas is actually shipped to Europe. Europeans are increasingly forcing Russia to sell its natural gas on transparent market-based terms rather than through opaque politically-charged contracts. And even the possibility of U.S. exports will help sustain pressure on Russia to sell natural gas on European terms.

Now, analysts have raised two major geopolitical risks that might result from natural gas exports. Some argue that the United States will be better off using its natural gas to replace oil in its

transportation system. But the best way to make that happen is not to block exports. It is to create incentives that directly encourage the use of natural gas in our cars and trucks. Similarly, efforts to promote natural gas as a lower carbon substitute for coal in power plants, while important, would be far better pursued through direct incentives to electric utilities rather than through export restrictions.

Others warn that allowing exports would link the price of U.S. natural gas to volatile world markets. Such an outcome is unlikely, though not impossible. U.S. natural gas prices will remain well below overseas ones due to the high cost of liquefying and transporting the fuel, and in addition, as long as U.S. export facilities are fully utilized, fluctuations in overseas prices will not influence the price of natural gas within the United States.

Despite the geopolitical and macroeconomic benefits of allowing exports, there remains substantial domestic opposition on other grounds. Congress would be wise to address opponents' legitimate concerns in order to maximize the odds that the country will capture the benefits of allowing exports.

Two areas are critical here: First, while the impact of exports on U.S. natural gas prices would likely be small, it could still be significant for low-income consumers. Congress can help address this by ensuring that the Low Income Home Energy Assistance Program, or LIHEAP, is fully funded.

Second, natural gas exports would boost U.S. gas production. That would be good news for the economy, but it would increase environmental risks. The prospect of exports makes it all the more important that Congress makes sure that strong rules are in place to ensure that shale gas development is done safely.

Members of the subcommittee, I thank you for the chance to speak with you today and look forward to answering any questions you have.

Mr. POE. Thank you, Dr. Levi.

[The prepared statement of Mr. Levi follows:]

COUNCIL *on* FOREIGN RELATIONS

April 25, 2013

Geopolitical Consequences of U.S. Natural Gas Exports

Prepared statement by
Michael A. Levi
David M. Rubenstein Senior Fellow for Energy and the Environment, and
Director, Program on Energy Security and Climate Change

Before the
Subcommittee on Terrorism, Nonproliferation, and Trade, House Committee on Foreign Affairs
United States House of Representatives
1st Session, *113th* Congress

Hearing on Natural Gas Exports: Economic and Geopolitical Opportunities

Chairman Poe, Ranking Member Sherman, members of the subcommittee, thank you for inviting me to speak with you about the geopolitical implications of allowing exports of liquefied natural gas (LNG) from the United States.

Barely five years ago most analysts were projecting large-scale LNG imports into the United States. Companies applied for permits to build dozens of import terminals and ultimately commissioned 11 plants. The ongoing boom in U.S. shale gas production has, however, rendered most imports uneconomic. Instead, with natural gas prices far lower in the United States than abroad, companies are exploring the possibility of exporting natural gas. To do so freely, they must be granted special permits from the Department of Energy, which must judge exports to countries with which the United States does not already have special free trade agreements ("Non-FTA countries") to be consistent with the public interest before approving them.

The Department of Energy has approved one application to export LNG to non-FTA countries and is considering at least twenty more applications. Approving these LNG export permits would benefit U.S. economic and security relationships regardless of whether (or how much) LNG is ultimately exported. If

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exports are approved, the volumes shipped are likely to be relatively small, with limited but again positive geopolitical and geoeconomic consequences for the United States.

This testimony draws on my study *A Strategy for U.S. Natural Gas Exports* that was published last year by The Hamilton Project at the Brookings Institution. That study also addressed the domestic economic and environmental impacts of allowing LNG exports; I have provided the committee with copies. Here I will focus on three areas: the geopolitical consequences of a DOE decision on LNG exports; the geopolitical consequences of exports themselves; and steps that the United States could take domestically to increase support for LNG exports in order to capture those benefits.

Consequences of an LNG Exports Decision

The U.S. decision regarding whether to allow LNG exports to non-FTA countries will have geopolitical consequences regardless of whether the United States ultimately exports significant volumes of LNG. The United States has long been a leading promoter of open international energy markets as a way of separating commerce from diplomatic intrigue. In recent years, it has challenged Chinese restrictions on exports of a host of raw materials, including rare earth metals that are critical to defense and clean energy applications, charging that those are designed to boost Chinese commercial competitiveness, and thus violate World Trade Organization (WTO) commitments. The U.S. effort has been successful at getting some Chinese restrictions struck down; others, most notably on rare earths, are still pending.

A U.S. decision to disallow LNG exports in order to bolster U.S. manufacturing competitiveness or protect the environment would undermine Washington's strength when challenging Beijing. Precisely the same justifications – particularly environmental protection – have been offered by China in defense of its own export restrictions. But WTO law does not allow the use of export restrictions for such ends. To be certain, if the United States were to restrict exports of LNG to non-FTA countries, there would be some dispute as to whether LNG (as something intermediate between a raw material and a manufactured product) is covered by WTO law at all. As a matter of international politics, though, any U.S. restrictions would be seen negatively and would undermine U.S. leverage more broadly.

Some have gone much further and argued that the United States should abolish even the DOE review process for LNG exports to non-FTA countries. Doing this, however, would remove valuable U.S. leverage in international trade negotiations. Any uncertainty, however slight, about U.S. openness to LNG exports creates incentives for other countries to enter free trade agreements with the United States, to the benefit of the U.S. economy. Such is the case with the ongoing Trans-Pacific Partnership (TPP) negotiations with Japan and with U.S.-Europe trade talks. The same dynamic could also be relevant to future trade negotiations with India.

It is also important to note that, in order to truly prevent exports of U.S. natural gas, the U.S. government would need to stop exports to Canada and Mexico too. Without such action, U.S. natural gas could be shipped to the Canadian Pacific coast for export, or more likely, U.S. gas could be shipped to Canada for domestic use, freeing up Canadian gas for international export, with similar consequences. And because U.S. natural gas prices are set in a North American market, U.S. natural gas prices would still rise, even though Canada would capture more of the economic benefits associated with building and operating export

terminals. Preventing that dynamic would require interfering with the open North American market for natural gas (supported by NAFTA) in unprecedented and damaging ways.

Consequences of LNG Exports

It is important to think separately about the consequences of a U.S. government decision to allow exports and the consequences of subsequent private decisions to build and operate LNG export facilities. It is entirely possible that the DOE could approve a series of export applications but that no export facilities will be built or used. Export facilities are expensive, costing several billion dollars each, and take years to build. Their economics only work if U.S. natural gas prices stay well below overseas natural gas prices. The total cost of liquefying, shipping, and regasifying natural gas at its destination can easily exceed five dollars per thousand cubic feet. With slightly higher U.S. prices or slightly lower Asian prices than currently anticipated, the economic incentive to export U.S. natural gas could disappear.

Many analysts nonetheless project that small but non-trivial volumes of U.S. natural gas will be exported. Natural gas exports will be naturally self-limiting: rising exports will boost domestic natural gas prices while driving down prices overseas; the shrinking gap between prices will cut off the economic incentive to export more. Moreover, other countries (such as Qatar) can produce natural gas more cheaply than the United States can. Most analysts have thus focused on U.S. exports of at most 5-6 billion cubic feet a day by 2020, perhaps ten percent of LNG trade (and a much smaller fraction of total natural gas trade), by then. This estimate should be treated cautiously – it is likely to reflect some degree of "groupthink" – but it is a useful if crude limit on likely sales.

How would exports of that magnitude affect geopolitics? U.S. exports would give large LNG buyers, including Korea, Japan, and India, an alternative to Middle Eastern and other producers for a part (though certainly not all) of their supplies. Those Middle Eastern suppliers (along with most other LNG producers) sell their natural gas through long-term contracts where the price of LNG is determined by a formula based on crude oil prices. The formula is subject to politically charged negotiations that entangle international relations with commerce in potentially dangerous ways.

In contrast with this practice, a significant fraction of U.S. natural gas exports will likely be sold on a "spot" basis, with the price of exported natural gas being equal to domestic U.S. prices plus a charge for liquefaction services. That will provide overseas buyers with some leverage in their negotiations with traditional suppliers. It will also provide them with some protection from economic damage that might result from volatile oil (and hence oil-linked natural gas) prices. It is highly unlikely, however, that U.S. LNG exports alone will be enough to shift broader LNG pricing to depoliticized spot markets. Pricing based on U.S. spot markets makes little sense for most natural gas producers, and an alternative spot market that might be more acceptable, perhaps anchored at a trading hub in Asia, remains far away at best.

U.S. LNG exports would also help Europe maintain leverage vis-à-vis Russia – even if, as appears likely, little U.S. natural gas is actually shipped to Europe. In the wake of the U.S. shale gas boom, Middle Eastern and North African suppliers have turned to Europe to sell their surplus natural gas, creating intense competition in the European market and increasingly forcing Russia to sell its natural gas on transparent, market-based terms rather than through opaque, politically charged contracts. Even the possibility of

significant U.S. natural gas exports will help sustain pressure on Russia to sell natural gas on these market-based European terms.

Against this limited but real benefit from LNG exports skeptics cite two major geopolitical risks. Some argue that the United States would be better off using its natural gas to replace oil in its cars and trucks, thereby reducing its vulnerability to volatile oil markets, and increasing its energy security. It is reasonable to want to increase adoption of natural gas in cars and trucks for this purpose. And, since exports would lead to a small increase in natural gas prices, it would also lead to a small decrease in the use of natural gas in cars and trucks. This impact would, however, be small; instead the main consequence of allowing exports would be to boost U.S. production rater than draw natural gas away from other uses. If policymakers want to increase the use of natural gas in U.S. cars and trucks, they should create new incentives to promote that directly, whether through new legislation (such as the NAT GAS Act) or regulation under the Clean Air Act. If such efforts increase demand for natural gas, they will raise prices, and thus reduce exports. Lower exports, if they occur, should be the *result* of efforts to boost the use of natural gas in cars and trucks, not a means to that end.

Others warn that allowing natural gas exports would link the price of U.S. natural gas to prices on world markets and hence expose the United States to natural gas price volatility resulting from events overseas. Such an outcome is, however, unlikely. U.S. natural gas prices will always remain well below overseas prices due to the large cost of liquefying, transporting, and regasifying the fuel. Moreover, so long as U.S. natural gas export facilities are fully utilized, fluctuations in overseas prices will not influence the price of natural gas within the United States. For overseas dynamics to influence U.S. price volatility, demand for U.S. natural gas would need to be able to vary depending on events overseas. If, however, U.S. export facilities are always fully utilized, this will not be possible; demand for U.S. gas would be constant at whatever level existing export facilities can support.

U.S. and international natural gas prices would only become linked if there were significant overinvestment in U.S. natural gas export facilities. In that case the United States would be left with a meaningful amount of export capacity that was not fully used. Events overseas could increase demand for U.S. natural gas, and with U.S. export facilities able to adjust to meet that new demand, U.S. prices would rise. The fact that liquefaction facilities cost billions of dollars each, take many years to build, and can be highly risky, however, makes the possibility of substantial overinvestment low. There will be ample time for financially unsound LNG export projects to collapse prior to their being completed and entering into service.

Creating Conditions for LNG Exports

Allowing LNG exports would avoid doing damage to U.S. relations with allies and to U.S. leverage in trade organizations and negotiations more broadly. Actual LNG exports would also provide some security to U.S. friends, particularly in Asia. Yet there remains substantial domestic opposition to LNG exports on competitiveness, equity, and environmental grounds. Congress would be wise to address these to the extent possible in order to help realize the benefits of allowing natural gas exports.

Natural gas exports would raise domestic natural gas prices. Though the price impact would likely be very small, it could still be significant, particularly for low-income consumers who spend a significant fraction of

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their income on electricity and home heating. In *A Strategy for U.S. Natural Gas Exports*, for example, I estimated that the bottom ten-percent of U.S. households could face an increase of fifty dollars a year in electricity and home heating costs as a result of natural gas exports. The Low-Income Home Energy Assistance Program (LIHEAP), if fully funded, helps protect against this risk, since it is indexed to heating and electricity costs. Congress would help sustain support for LNG exports by ensuring that LIHEAP is fully funded.

Natural gas exports would also boost U.S. natural gas production. This would be good news for the U.S. economy, including for landowners and manufacturers that supply the natural gas industry, but it would also increase environmental risks to air, water, and communities that result from intensive shale gas development. Public scrutiny is likely to be particularly acute if natural gas development is seen as benefiting overseas buyers through exports rather than helping U.S. consumers. Exports thus increase the importance of implementing strong, smart regulations to ensure that shale gas development is done safely. The Natural Gas Subcommittee of the Secretary of Energy Advisory Board has issued a smart set of recommendations for improving the environmental safety of natural gas development. Congress could build on that by mandating minimum standards for shale gas development, with most details remaining in the hands of state and local authorities, who are better equipped to deal with the state-by-state idiosyncrasies of shale gas development.

Conclusion

The shale gas boom can continue to strengthen the U.S. economy, cut carbon emissions, and bolster U.S. national security, if Congress and the administration make the right decisions. Allowing growth in LNG exports as part of a broad strategy aimed at capturing the opportunities created by abundant shale gas while protecting against accompanying risks would be a wise step forward. I thank you for the chance to speak with you about natural gas exports and look forward to answering any questions you have.

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Mr. POE. Mr. Mallino, you have 5 minutes.

STATEMENT OF MR. DAVID MALLINO JR., LEGISLATIVE DIRECTOR, LABORERS INTERNATIONAL UNION OF NORTH AMERICA.

Mr. MALLINO. Thank you, Mr. Chairman. I am going to beg your indulgences for my loss of a voice. Washington, DC, pollen, and a loud, raucous rally yesterday in support of the Keystone XL Pipeline has left me a little bit wounded so I apologize, but I am going to croak through this as best I can.

Mr. Chairman, on behalf of the 500,000 members of the Labors International Union of North America, I would like to thank you and Ranking Member Sherman and the members of the subcommittee for allowing us to testify today. As you know, too many Americans are out of work. Within the construction industry, the unemployment rate reached over 27 percent in 2010, and joblessness in the sector still remains far higher than any other industry with over 1 million construction workers currently unemployed in the United States.

However, one bright spot for LIUNA members has been the growth in work hours associated with natural gas pipeline construction. As you know, the production of North America's natural gas supply has increased dramatically in recent years through the development of shale gas reserves, which is largely the result of the development of hydraulic fracturing for the extraction of natural gas. The development of these domestic reserves of natural gas has dramatically increased work opportunities for our members, and the continued development of these resources will not only lead to job creation and expanded economic opportunities for America's workers, but will also help put the United States on a path toward energy independence.

Affordable domestic natural gas supplies have the potential to be an economic game changer across many sectors of the economy. However, in order to realize the full economic benefits of the expanded U.S. gas resources, the industry must be able to find a price for its product that makes continued development profitable.

In 2012, LIUNA members worked over 11 million hours on pipeline projects under the National Pipeline Agreement, and we are just one of four crafts that are signatories to that agreement. America workers need the access to the good paying jobs, family-sustaining wages, and the kind of jobs that the oil and natural gas sector provide. In addition to the drilling operations to recover the gas, there is extensive pipeline and compressor station infrastructure required to move the gas to facilities for processing or export.

Often, in an attempt to kill new domestic energy sources, the enemies of job creation call these jobs dangerous and dirty. The fact of the matter is, construction is, in fact, a dangerous occupation, but when performed by trained workers it can be less dangerous. It is also less environmentally damaging when done by properly trained construction workers.

Opponents of the industry also try to disparage these jobs by passing a value judgment that holds these jobs to be of lesser value because by its very nature, the construction project has a completion date and therefore, that individual job will come to an end at

some point. They call these jobs temporary in order to diminish the importance, and they recruit others to join with them in a course of negativity in the mistaken belief that these jobs have no real value to society.

The report issued by the Energy Information Administration, the statistical arm of the U.S. Department of Energy, predicts that shale gas production will continue to increase, while expected natural gas consumption and the industry power generational sector is to increase significantly.

In order to find a price point that makes extraction of these tight gas reserves economically feasible, gas producers must be able to move natural gas to international markets. A number of LNG facilities' liquefied natural gas terminals have been proposed for construction, which will themselves be economic engines that will create good jobs and other benefits. These are large-scale projects that cost billions of dollars to build and employ thousands of workers for several years during the principal construction.

One of these proposed LNG export terminals, the Jordan Cove Energy Project in Coos Bay, Oregon, is expected to be built under a project labor agreement which will maximize the quality of the jobs for the construction trades on that project. This PLA will ensure that the workers on this massive project will possess the highest skills and best training while ensuring that the workers receive fair wages and working conditions.

This project is expected to provide millions of work hours for the buildings trade crafts and will invest approximately $5.7 billion into the local economy. Natural gas development also produces needed government revenues at the Federal, State, and local levels. The Coos Bay Project is expected to generate $20 million in revenue for local and State governments in the first 3 years of operation, and $30 million to $40 million a year thereafter. These resources can help our State and local governments protect their communities from harmful budget cuts that have led to layoffs and the elimination of much-needed services.

I will try to wrap up. I am sorry, guys. Responsible development of our natural gas resources is essential to the United States and is going to fully maximize the economic benefits of our oil and natural gas reserves. Best industry practices based on innovation and technology, combined with a highly-trained, skilled workforce represents an important step in addressing public concern. Through our affiliation with the Building Construction Trades Department of AFL–CIO, LIUNA is a partner of the Oil and Natural Gas Labor Management Committee. This joint business and labor committee has developed a set of principles that we believe companies engaged in the extraction and transportation of natural gas and oil should adhere to. They are in my formal submitted record. I will not read them to you.

To be clear, LIUNA is also committed to helping advance policies that reduce our greenhouse gas emissions. We believe that an aggressive, science-based approach to emissions reduction is not only necessary from the perspective of achieving a sustainable environment, but that it will, in itself, be good for our economy and for working families. However, we reject the notion that natural gas resources should be abandoned or constrained as a path toward

greater sustainability. We believe that responsible development of natural gas is essential for the future economic prosperity of the United States, and we will continue to advocate for policies that foster growth in this sector.

We look forward to working with the members of the committee and other policymakers who want to see our economy recover and produce American jobs that can foster middle-class families. Once again, the laborers thank you for this opportunity to testify before you today.

Mr. POE. Thank you, Mr. Mallino.

[The prepared statement of Mr. Mallino follows:]

Testimony of David L. Mallino

Director, Legislative Department

Laborers' International Union of North America

Before the Subcommittee on Terrorism, Non-Proliferation, and Trade

Committee on Foreign Affairs

US House of Representatives

Exportation of Liquefied Natural Gas

April 25, 2013

Mr. Chairman -

On behalf of the 500,000 members of the Laborers' International Union of North America (LIUNA), I would like to thank you and Ranking Member Sherman and the members of the subcommittee for allowing me to testify today.

Too many Americans are out of work. Within the construction industry the unemployment rate reached over 27% in 2010, and joblessness in the sector remains far higher than any other industry, with over 1 million construction workers currently unemployed in the United States.

However, one bright spot for LIUNA members has been the growth in work hours associated with natural gas pipeline construction. As the Committee is surely aware, the production of North America's natural gas supply has improved dramatically in recent years through commercial development of shale gas reserves. This dramatic growth is largely the result of the development of hydraulic fracturing for the extraction of natural gas.

Domestic reserves of oil and natural gas, combined with improved extraction technologies, like horizontal drilling and hydraulic fracturing, have dramatically increased work opportunities for members of LIUNA. The development of these resources will not only lead to job creation and expanded economic opportunities but will also help put the United States on a path toward energy independence. Affordable domestic natural gas supplies have the potential to be an economic game changer that can lead to a resurgence of the American manufacturing sector. However, in order to realize the full economic benefits of an expanded U.S. gas resource, the industry must be able to find a price for its product that makes continued development profitable.

There are a number of known shale gas and oil deposits in the United States which are in differing states of development. Major shale plays are located in nearly every one of LIUNA Regions including our: Mid-Atlantic; Ohio Valley – Southern States; Great Lakes; Northwest; Midwest; and New England regions. LIUNA's Eastern Region is also experiencing increased pipeline work for delivering gas from Marcellus Shale wells into the New Jersey and New York City markets. In 2012, LIUNA members worked over 11 million hours on pipeline projects under the National Pipeline Agreement, and we are just one of four construction crafts that are signatories to that agreement.

American workers need access to the good paying, family sustaining jobs that growth in the oil and natural gas sector provide. In addition to drilling operations to recover natural gas ("upstream" work), there is an extensive pipeline/compressor station infrastructure required ("midstream") to move gas to facilities for processing or export ("downstream").

Often in an attempt to kill the development of new domestic energy sources, the enemies of job creation call these jobs dangerous and "dirty." The fact of the matter is, construction is in fact a dangerous occupation, and when not performed by trained workers can lead to unacceptable environmental harm. However, when construction is performed by well-trained union workers, it is less dangerous and in a more environmentally sensitive manner.

Opponents of the industry often impose a value judgment that holds construction jobs to be of a lesser value because, by its very nature, a construction project has a completion date and therefore that individual job will come to an end at some point. They call these jobs "temporary" in order to diminish their importance and recruit others to join in a chorus of negativity in the mistaken belief that these jobs have no "real" value to society. .

A report issued by the Energy Information Administration (EIA), the independent statistical arm of the U.S. Energy Department, projects that shale-gas production will continue to increase with expected natural gas consumption in industrial and power generation sectors increasing significantly. According to the 2013 Annual Energy Outlook, natural gas consumption rises from 24.4 trillion cubic feet in 2011 to 28.7 trillion cubic feet in 2035 and should continue to grow to 29.5 trillion cubic feet in 2040. The report also projects that the natural gas prices will remain affordable and stable over the long-term.

LIUNA believes that responsible development of oil and natural gas resources is essential for the future economic prosperity of the United States, and we will continue to advocate for policies that will foster growth in this sector of the economy. Our nation must have a diversified portfolio of energy production and the Laborers have invested significant resources in providing our member with the skills they need to work in these industries.

In order to find a price point that makes extraction of these tight gas reserves economically feasible, gas producers must be able to move natural gas to international markets. A number of liquefied-natural-gas (LNG) export terminals have been proposed for construction, which will themselves be economic engines that will create good jobs and other benefits. These

are large scale projects that cost billions of dollars to build and employ thousands of workers for several years during principle construction.

One of these proposed LNG export terminals, the Jordan Cove Energy Project in Coos Bay, Oregon is expected to be built under a project labor agreement (PLA) which will maximize the quality of the jobs for the construction trades that work on the project. This PLA will ensure that the workers on this massive project will possess the highest skills and best training while ensuring that the workers receive fair wages and working conditions. This project is expected to provide millions of work hours for the building trades' crafts and will invest approximately $5.7 billion into the local economy.

Natural Gas development will also produce needed government revenue at the federal, state, and local levels. For instance, it is projected that the Jordan Cove Energy Project will generate $20 million a year in revenue for local and state governments for the first three years of operation and $30-$40 million a year thereafter. These new resources can help our state and local governments protect their communities from harmful budget cuts that have led to layoffs and the elimination of much needed services.

In a recent report, the Bipartisan Policy Center points out that, by increasing production and decreasing consumption of certain fuels, opportunities for net exports arise. The Report goes on to conclude: "Restricting international trade in fossil fuels is not an effective policy to reduce global greenhouse gas emissions or to advance domestic economic interests. . ." The BPC's report also concludes that LNG exports are likely to have only modest impacts on domestic natural gas prices.

The export of LNG can help drive additional U.S. natural gas production and support hundreds of thousands of additional U.S. jobs in engineering, manufacturing, construction, and operation of the export infrastructure, as well as others indirectly along the equipment supply chain. Flexibility to export product in times of market imbalance can help the industry operate efficiently and maintain production levels. This enhances US energy and economic security.

Responsible development of our natural resources is essential if the United States is going to fully maximize the economic benefits of our domestic oil and natural gas reserves. Best industry practices based on innovation and technology combined with a highly trained, skilled workforce represents an important step in addressing public concern. Through our affiliation of the Building and Construction Trades Department of the AFL-CIO, LIUNA is a partner in the

Oil and Natural Gas Labor Management Committee. This joint business and labor committee has developed a set of principles that we believe companies engaged in the extraction and transportation of oil and gas should adhere to. They include:

- Complying with all applicable local, state, and federal occupational safety and health requirements to ensure the safety and health of employees.
- Hiring first from the pool of highly skilled, productive local workers to maximize the local benefits of natural gas development.
- Investing in the skill development of local workers.
- Increasing diversity in the workforce by prohibiting discrimination and actively recruiting women and people of color, and our military veterans.
- Developing a stringent health and safety plan for each project.
- Requiring policies that ensure workers are free of alcohol and drugs.
- Establishing a safety committee comprised of an equal number of representatives of labor and management.
- Operating facilities in a manner that protects the environment and the safety and health of workers and the public.
- Promptly advise appropriate officials, employees, customers and the public of information on significant industry-related safety, health and environmental hazards, and recommend protective measures.
- Delivering information, training, and technical assistance to contractors, suppliers, customers, transporters and others in the safe use, transportation and disposal of raw materials, products and waste materials.
- Promoting responsible laws, regulations and standards to safeguard the community, the workplace and the environment.

LIUNA is also committed to helping advance policies that will reduce the Nation's emissions of green-house gasses. We believe that an aggressive and science-based approach to emissions reductions is not only absolutely necessary from the perspective of achieving a sustainable environment; it will be good for our economy and for working families. However, we reject the notion that natural gas resources should be abandoned or constrained as a path toward greater sustainability.

LIUNA members look forward to working with thoughtful policy makers who want to see our economy recover and produce American jobs that can support middle class families. We believe that responsible development of oil and natural gas resource can help provide many of those jobs.

Once again, thank you for allowing me to testify before you today.

Mr. POE. Mr. Ratner.

STATEMENT OF MR. MICHAEL RATNER, SPECIALIST IN ENERGY POLICY, CONGRESSIONAL RESEARCH SERVICE

Mr. RATNER. Thank you, Chairman Poe, Ranking Member Sherman, and members of the subcommittee. My name is Michael Ratner, and I am a specialist in energy policy at the Congressional Research Service. CRS appreciates the opportunity to testify on the important issue of liquefied natural gas exports. Additionally, in accordance with our enabling statutes, CRS takes no position on any related legislation.

Prior to the advent of shale gas in 2007, the United States was viewed as a growing natural gas importer. Terminals were built in the 2000s to import LNG from overseas and prices were rising. The success of shale gas production has reversed these trends. Prices have come down since peaking in 2008, and the U.S. price for gas is lower than other regional markets. Natural gas imports are down and LNG imports terminals sit idle with many having applied for export permits. This brings us to where we are today, weighing the benefits and costs of LNG exports. I will touch upon four components of the debate: Economic impacts, trade issues, environmental concerns, and the Department of Energy's approval process.

First, all else being equal, LNG exports should raise domestics prices because they increase total demand. However, whether LNG exports are good or bad for the economy in part depends on one's perspective. Most gas producers who have faced low domestic prices would like to export to expand their market and access higher international prices. Some large industrial consumers of natural gas argue that allowing exports will raise domestic prices and stifle the economic benefits of having a low-cost input.

For the Federal Government, LNG exports may or may not lead to a net increase in Federal revenue. Taxes paid by LNG exporters because of higher gas company profits could be offset by a decline in taxes paid by large consumers of natural gas because of higher domestic prices. Federal royalties would only increase if new natural gas production comes from Federal lands. Meanwhile, directly taxing exports raises constitutional issues. Natural gas is used for three primary purposes: Electricity generation, residential and commercial heating, and industrial processes. The specifics of each of these market segments will determine the effect of LNG exports. For example, the price of natural gas is just one component of the total cost of residential heating.

While LNG exports may raise gas prices, new supplies may reduce transit costs. In addition to current uses, there has been discussion of using natural gas as a transportation fuel. Although some progress is being made, it is more a long-term prospect because of the infrastructure and technological changes that would have to occur. Price is just one factor that companies and consumers would consider before investing in natural gas-fueled vehicles.

Second, the decision to permit or restrict LNG exports also raises trade considerations. As a member of the World Trade Organization, the United States could be subject to cases under the general

agreement on tariffs' and trades' general prohibition against quantitative restraints if exports were limited. While certain exemptions from this prohibition may apply, export restrictions may put the United States in a contradictory position vis-à-vis cases that it has brought to the WTO.

Third, as shale gas came to market, it was hailed as a way to reduce emissions from dirtier fossil fuels, but environmental concerns were also raised, primarily because of the industry process known as hydraulic fracturing or fracking. Environmental groups against exports assert that additional production from shale for export implies more fracking.

Finally, to deny an LNG permit to non-Free Trade Agreement countries, DOE must determine that exports would not be in the public interest. To make its determination, DOE evaluates many factors: Domestic need, previously approved capacity, adequacy of supply, the environment, geopolitics, and energy security, among other things.

DOE commissioned two studies as part of its evaluation. One by the Energy Information Administration on price effects, and one by NERA Economic Consulting on macroeconomic impacts of LNG exports. Both studies have received praise and criticism by various stakeholders. For example, EIA scenarios were viewed as unrealistic because of the high volumes considered, but those are now well below the level of export applications. NERA's use of data from EIA's 2011 Annual Energy Outlook was considered dated. The data did not include potential domestic industrial demand, nor did it include recent improvements in shale gas extraction. However, EIA bases its projections on existing policy, technology, and data, not possible changes in any of these.

Despite recent testimony, DOE has not laid out a clear timetable for approving pending permits, nor how it weighs each input in its decision. Some stakeholders have faulted DOE for a lack of transparency.

Thank you for the opportunity to appear before the committee. I would be happy to address any questions you may have.

Mr. POE. Thank you, Mr. Ratner.

[The prepared statement of Mr. Ratner follows:]

Testimony of Michael Ratner,
Specialist in Energy Policy for Congressional Research Service,
Before the House of Representatives Committee on Foreign Affairs,
Subcommittee on Terrorism, Non-Proliferation, and Trade,
Hearing on Natural Gas Exports: Economic and Geopolitical Opportunities
on April 25, 2013

Chairman Poe, Ranking Member Sherman, Members of the Committee, my name is Michael Ratner, I am a Specialist in Energy Policy at the Congressional Research Service. Thank you for inviting me to testify on the important issue of liquefied natural gas (LNG) exports. In addition to my remarks today, CRS has an in-depth report on this topic, and in accordance with our enabling statutes, CRS takes no position on any related legislation.

Introduction

The United States would not be considering LNG exports without the advent of shale gas. Prior to 2007, the United States was viewed as a growing natural gas importer. Terminals were built in the 2000s to import LNG from overseas and prices were rising. The success of shale gas production has reversed these trends. Prices have come down since peaking in 2008, and the U.S. price for gas is lower than other regional markets. Pipelines are being reconfigured to transport gas from new supply centers to consumers. Natural gas imports are down, and LNG import terminals sit idle with many having applied for export permits.

This brings us to where we are today, weighing the benefits and costs of LNG exports. I will focus on four components of the debate—economic impacts, trade issues, environmental concerns, and the Department of Energy's (DOE) approval process.

Economic Impacts

First, all else being equal, LNG exports should raise domestic prices because they increase total demand. However, whether LNG exports are good or bad for the economy, in part, depends upon one's perspective. Most gas producers, who have faced low domestic prices, would like to export to expand their market and access higher international prices. Some large industrial consumers of natural gas argue that allowing exports will raise domestic prices and stifle the economic benefits of having a low cost input. For the federal government, LNG exports may or may not lead to a net increase in federal revenue. Additional taxes paid by LNG exporters because of higher gas company profits could be offset by a decline in taxes paid by large consumers of natural gas because of higher domestic prices. Federal royalties would only increase if new natural gas production comes from federal lands. Meanwhile, directly taxing exports raises constitutional issues.

Natural gas is used for three primary purposes: electricity generation, residential and commercial heating, and industrial processes. The specifics of each of these market segments will determine the effects of LNG exports. For example, the price of natural gas is just one component of the total cost of residential heating. While LNG exports may raise gas prices, new supplies may reduce transit costs. In addition to current uses, there has been discussion of using natural gas as a transportation fuel. Although some progress is being made, it is more a long-term prospect because of the infrastructure and technological changes that would have to occur. Price is just one factor that companies and consumers will consider before investing in natural gas fueled vehicles.

Trade Issues

Second, the decision to permit or restrict LNG exports also raises trade considerations. As a member of the World Trade Organization (WTO), the United States could be subject to cases under the General Agreement on Tariffs and Trade's General Prohibition Against Quantitative Restraints if exports were limited. While certain exemptions from this prohibition may be granted, export restrictions may put the United States in a contradictory position vis-à-vis cases it has brought to the WTO.

Environmental Concerns

Third, as shale gas came to market, it was hailed as a way to reduce emissions, but environmental concerns were also raised, primarily because of the industry process known as hydraulic fracturing, or "fracking." Environmental groups against exports assert that additional production from shale for exports implies more fracking.

DOE Permit Process

Finally, DOE's statutory requirement to determine if LNG exports to countries with which the United States does not have a free trade agreement (FTA) are "not" in the public interest has attracted a lot of attention. To make its determination, DOE evaluates many factors, including domestic need, previously approved capacity, adequacy of supply, the environment, geopolitics, and energy security, among others things. DOE commissioned two studies as part of its evaluation, one by the Energy Information Administration (EIA) on price effects and one by NERA Economic Consulting (NERA) on macroeconomic impacts of LNG exports. Both studies have received praise and criticism by various stakeholders. EIA's scenarios were viewed as unrealistic because of the high volumes considered, but those are now well below the level of export applications. NERA's

use of data from EIA's 2011 Annual Energy Outlook was considered dated. The data did not include potential domestic industrial demand, nor did it include recent improvements in shale gas extraction. EIA bases its projections on existing policy, technology, and data, not possible changes in any of these.

Despite recent testimony, DOE has not laid out a clear timetable for approving pending permits, nor how it weighs each input in its decision. Some stakeholders have faulted DOE for a lack of transparency.

Thank you for the opportunity to appear before the committee. I will be happy to address any questions you may have.

Mr. POE. I want to start the 5-minute questioning by each member. I will start with Mr. Bryngelson. How many jobs will the Lavaca Project create?

Mr. BRYNGELSON. During construction, it is approximately 2,500, and in long-term operation, Phase I would be about 200. Phase II would double that to about 400.

Mr. POE. How long have you been waiting for the Department of Energy approval?

Mr. BRYNGELSON. We filed in October of last year.

Mr. POE. When do you expect a decision? Do you know?

Mr. BRYNGELSON. We don't know. We are hopeful soon, but a lot of the project is depending on that at this point. We have no clear idea.

Mr. POE. How much does it cost you a day or a month while you wait for that permit?

Mr. BRYNGELSON. Well, right now, we are moving through the permitting process, so it is not impacting our costs specifically. What is impacting us is our ability to secure customers, and that could jeopardize the whole project.

Mr. POE. What does that mean?

Mr. BRYNGELSON. That means if we can't sign up non-free trade customers, we don't have customers. We don't have a project. And every day that goes by it is harder and harder to keep just the baseline spend to get permitting, which over the next year is approximately $10 million.

Mr. POE. Let me ask you this, and all of the members of the panel will weigh in, why does the permitting process take so long to get approved by the Department of Energy? How come it takes so long?

Mr. BRYNGELSON. I wish I had an answer to that question, sir.

Mr. POE. You don't know. Dr. Montgomery? You are the expert. Do you know?

Mr. MONTGOMERY. No, I don't know what DOE is doing.

Mr. POE. Dr. Levi?

Mr. LEVI. I trust that because this is such a new area, this country has changed from being very much a consumer into also a major energy producer, that it is taking time to analyze the cost and benefits and ins and outs, just like this committee is. But I agree that time does matter, and that there is a limited market, and different companies around the world are trying to do contracts, particularly with key buyers in Korea and Japan, and so the timing of our approvals will have consequences.

Mr. POE. How long does it take normally to get a DOE approval for a permit?

Mr. LEVI. We don't know because we have had only one experience.

Mr. POE. And that took how long?

Mr. LEVI. Anyone else know?

Mr. POE. No one knows. Mr. Ratner, do you know?

Mr. RATNER. I would say probably about a year or so. I can't remember exactly when Cheniere applied for it. But one thing I would also add that I find interesting, I mean, everybody, for good reason, is focusing on the DOE process, but the FERC process, which also takes over a year to 2 years, people aren't complaining

about in part because they know the FERC process. You know, Excelerate knows what it needs to do to apply to FERC in order to move that application along.

Mr. POE. Can do both processes move together, or does DOE have to finish theirs before FERC starts?

Mr. RATNER. They can move together.

Mr. POE. All right. Let me ask you this, Dr. Levi. When I was in India, I talked to the foreign minister. The only thing they wanted to talk about was getting natural gas from the United States to India. They made it really simple for me; the cost of their production and transportation in India is higher than for us to produce it in the United States, transport it, make a profit, and they still get a good deal in India.

And the question was, why aren't we exporting natural gas to India? Can you help me out with that a little bit?

Mr. LEVI. Well, it will take time to build terminals and export to India, but the way you describe the economics is correct. Natural gas production in India is expensive. There are barriers to production, and so there will be incentives to export natural gas to India. It would help them reduce emissions relative to building more coal-fired capacity. That said, it is not clear to me that it will be an alternative to other sources of natural gas. India has rapidly-growing demand for energy, and it will probably try to bring in resources from wherever it can.

But there is no doubt that the more we are engaged in a positive way with them on natural gas, the more influence we will have on the other decisions they make.

Mr. POE. Politically, for the United States, wouldn't it help the relationship to have India look to the United States instead of look to China, or Pakistan, or somewhere else, even Russia for natural gas? Would this help us politically with this nation?

Mr. LEVI. There is no doubt that being open to natural gas exports to India would help the United States politically. There is a long history in the U.S.-India relationship, as least as the Indians see it, of the United States interfering with free trade to India's detriment, and this goes back a long way in the Indian political memory.

So when we talk about trade restrictions on a commodity that India cares about, this isn't just an isolated issue, it speaks to a broader set of concerns and a broader set of trust issues with the United States. So certainly allowing those exports would help. Of course, whether natural gas went from the United States to India would be the decision of private companies based on where they thought the contracts were most attractive.

Mr. POE. I understand there was a contract signed today with India and a Houston-based company for a 20-year contract and there is also a contract with a Maryland corporation for the same thing.

Last question. Mr. Ratner, if you could answer really quick. The WTO, we have got them sitting over here. Is the United States going to be in court if we don't fix this problem with the WTO?

Mr. RATNER. Very possibly. It will depend upon, you know, some of the countries that we discussed. I mean, the odds of Japan suing

us in international court is possible, but how likely it would be, you know, remains to be seen.

Mr. POE. I hope the Department of Energy knows that that is a possibility as well. I now will yield 5 minutes to the ranking member, Mr. Sherman from California, who is also the timekeeper.

Mr. SHERMAN. Of three major fossil fuels, the one that is most versatile is petroleum because you can move it from one continent to another rather cheaply. We export coal, India and China don't really care very much about whether they create twice as much carbon for every kilowatt they generate.

Mr. Ratner, why are you even talking about exporting natural gas to China and India when instead, they could purchase our coal? That has to relate to the cost of shipping. Can you provide some estimates as to what it costs to export an MCF of natural gas, that means liquefy it and move it across oceans, versus what it costs to move coal that would have the same number of BTUs? And if you don't know, just answer for the record.

Mr. RATNER. I am not sure of the cost of shipping coal. I know relative to gas, it is a lot cheaper and a lot easier than liquefying gas and putting it on a cryogenic tanker which, I mean, some of the numbers I have seen to liquefy is about $3 per thousand cubic feet, and to ship it to Asia would be about $2, or $2.50.

Mr. SHERMAN. So maybe $6 per MCF. I have no idea. You know, coal is heavy. It is not as dense in its energy so I have no idea what it would cost, but I know CRS is great at research and I know you will get an answer for the record.

[Material submitted to the subcommittee by Mr. Ratner after the hearing follows:]

U.S. LNG EXPORTS - AN INTERNATIONAL PERSPECTIVE

A Presentation to
The Washington LNG Forum - EPRINC Embassy Series
Co-hosted With the Embassy of the Russian Federation
Washington
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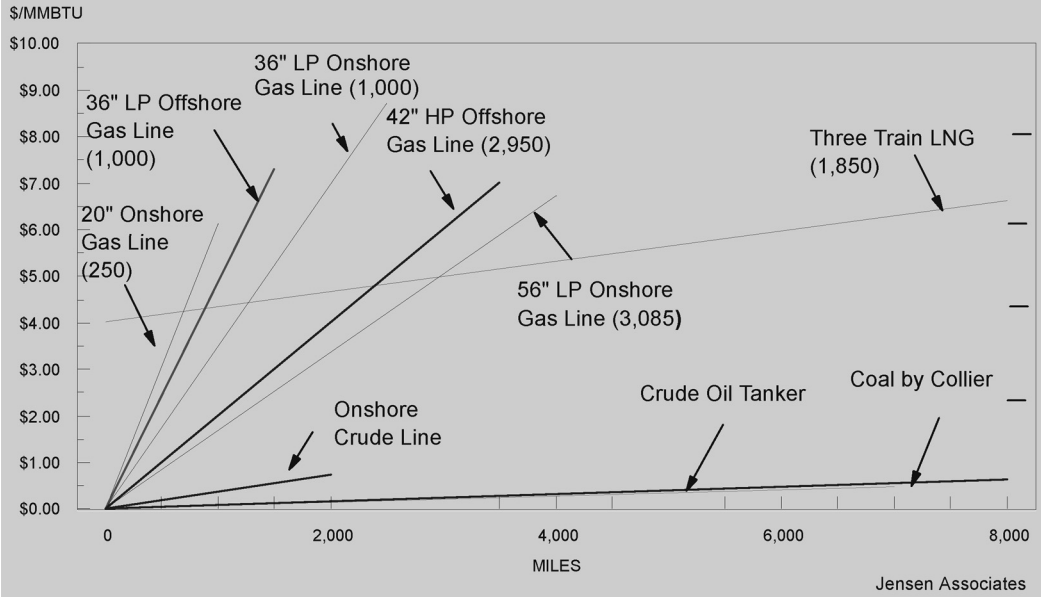
Figure 5
ILLUSTRATIVE 2011 COSTS OF GAS, OIL AND COAL TRANSPORTATION
SHOWING GAS'S HIGHER COSTS AND THE EFFECT OF SCALE
(Gas Delivery Capability in MMCFD)



Mr. SHERMAN. We have heard from both Dr. Levi and Dr. Montgomery about economic theories. I will just point out first that while the economic theory is that free trade works perfectly, and will enhance everybody, no one has been able to explain why we have a $600 billion trade deficit. It is theoretically impossible, and economists are in the same position as those aerospace engineers who said we have got a great theory, but we can't explain how a bumblebee can fly. There is nothing the matter with the bumblebee. And the fact is that we do have a huge trade deficit.

The other thing I will point out to Dr. Levi is, you said okay, if we want to adjust for this, we could provide more funding for low-income consumers, and we could provide incentives, which would mean subsidies for natural gas vehicles. We don't have any money. So if we want both vehicles and low-income consumers to get cheap natural gas, we are going to have to keep natural gas cheap. The other way to do it from an economic perspective would be to provide an incentive for natural gas vehicles by taxing gasoline. And I see you nodding because you are an economist. If you were a political consultant, you would not be nodding.

Mr. Mallino, you talk about jobs, but what we really need are good jobs at good wages. You are looking at certain applications that have been filed. They are just the tip of the iceberg if we open this. With the ones that you are focused on, you have got project labor agreements or expect them, so those will be good jobs.

Mr. MALLINO. Correct.

Mr. SHERMAN. But the vast majority of the focus on where to build these facilities, they are all in Right to Work States with the exception of Oregon. Can you give us an idea of what, you know, what right to work, or what I call right to work for less will mean in terms of the wages and working conditions of those who work on these projects?

Mr. MALLINO. As you know, Congressman, sometimes we also refer to it as a so-called right to work because it is everything except for an actual right to work. Right to Work States generally have, and I will have to look up the specific number, but generally have a wage and benefits scale about 30 percent less than those States that are not Right to Work States. And I will get the specific numbers for you. But there have been a number of very good studies that show that in Right to Work States workers have a much lower standard of living, and wage and benefit package. We like to believe that there should be a right to prosperity, not just a right to work.

Mr. SHERMAN. Or at least a right to organize according to the U.N. Declaration of Human Rights.

Mr. MALLINO. Right.

Mr. SHERMAN. Finally, I will point out, because my time is nearly expired, that I don't think congressional action just opening this will pass by itself through the Senate, but if we marry any legislative fix to this to nationwide standards for fracking, designed to assure environmental safety, it is much more likely to pass.

I would have said also, perhaps, some revenue from an export tax, but unfortunately, the Constitution was written at a time when we were worried about the export of cotton and corn and seems to have prohibited that. I will go back to my office and try

to find a loophole in what Mr. Ratner points out to be in the U.S. Constitution—not loophole, provision applicable to these modern circumstances, and I yield back.

Mr. POE. Well said.

Mr. LEVI. Can I briefly address the question of cars and trucks because I think it is important.

Mr. POE. Okay.

Mr. LEVI. Prohibiting exports and creating new incentives to get natural gas for our cars and trucks aren't alternative options for achieving the same goal. Prohibiting exports would not get a lot of natural gas into our cars and trucks. And we do have ways of encouraging natural gas use that don't require new spending on the part of government. We are already encouraging it through new corporate average fuel economy standards. We could further encourage it by modifying the advanced biofuel part of the Renewable Fuel Standard which is not being met and is repeatedly waived each year in a way that encourages the use of gas to liquid fuels.

So there are creative ways to do this without incurring additional debt or having everyone lose their congressional seats by trying to pass a gasoline tax.

Mr. MONTGOMERY. Could I also respond, I think, to a question that was addressed to me? I think there is a general consensus among economists that we understand exactly where the trade deficit comes from. It is the observation of the twin deficits, which I, unfortunately, remember going all the way back to the 1980s and colleagues at Brookings explaining it to me, simply meant that the trade deficit comes from our huge budget deficits, that when the government borrows, the borrowing leads to a differential between what we are importing and what we are exporting.

Mr. SHERMAN. Let me just note for the record, when we had a budget surplus in the latter years of the Clinton administration we had a huge trade deficit, and Japan runs a much larger national deficit than we do and they have a huge trade surplus. Once again the bumblebee is flying, but the theory doesn't work.

I yield back.

Mr. POE. I thank the ranking member. Just to follow up on the question to Mr. Mallino, in Texas until recently, until Mr. Weber took over some of my congressional area, I represented all the energy industry down in southeast Texas. My understanding is in the energy industry and Right to Work States you have a lot of union workers and you also have nonunion workers.

Mr. MALLINO. We do.

Mr. POE. I would ask Mr. Ratner, can you find out the percentage of union and nonunion workers in the energy industry and get back with this committee.

Mr. RATNER. Sure.

[Material submitted to the subcommittee by Mr. Ratner after the hearing follows:]

UNION MEMBERSHIP AND COVERED EMPLOYEES IN SEGMENTS OF THE OIL AND NATURAL GAS INDUSTRY

INDUSTRY		Union member	Covered by a collective bargaining agreement	% Union	% Covered
Oil and gas extraction	Yes	3,960	4,510	4.4%	5.0%
	No	86,434	85,884	95.6%	95.0%
	Total	90,394	90,394		
Natural gas distribution	Yes	29,925	30,878	26.8%	27.7%
	No	81,742	80,789	73.2%	72.3%
	Total	111,667	111,667		
TOTAL	Yes	33,885	35,388	16.8%	17.5%
	No	168,176	166,673	83.2%	82.5%
	Total	202,061	202,061		

INDUSTRY BY OCCUPATION

Oil gas and extraction		Union member	Covered by a collective bargaining agreement	% Union	% Covered
Management, business, and financial occupations	No	26,732	26,732	0.0%	0.0%
Professional and related occupations	Yes	1,249	1,249	5.1%	5.1%
	No	23,464	23,464	94.9%	94.9%
	Total	24,713	24,713		
Service occupations	No	671	671	0.0%	0.0%
Sales and related occupations	No	1,155	1,155	0.0%	0.0%
Office and administrative support occupations	No	4,360	4,360	0.0%	0.0%
Construction and extraction occupations	Yes	2,061	2,061	10.2%	10.2%
	No	18,231	18,231	89.8%	89.8%
	Total	20,292	20,292		
Installation, maintenance, and repair occupations	Yes	650	650	12.5%	12.5%
	No	4,567	4,567	87.5%	87.5%

	Total	5,217	5,217		
Production occupations	No	2,336	2,336	0.0%	0.0%
Transportation and material moving occupations	Yes	0	550	0.0%	11.2%
	No	4,918	4,368	100.0%	88.8%
	Total	4,918	4,918		
Natural Gas Disbribution					
Management, business, and financial occupations	Yes	1,847	1,847	13.1%	13.1%
	No	12,262	12,262	86.9%	86.9%
	Total	14,109	14,109		
Professional and related occupations	Yes	153	1,106	2.3%	16.5%
	No	6,568	5,615	97.7%	83.5%
	Total	6,721	6,721		
Sales and related occupations	No	7,724	7,724	0.0%	0.0%
Office and administrative support occupations	Yes	7,655	7,655	26.1%	26.1%
	No	21,672	21,672	73.9%	73.9%
	Total	29,327	29,327		
Construction and extraction occupations	Yes	8,039	8,039	53.1%	53.1%
	No	7,090	7,090	46.9%	46.9%
	Total	15,129	15,129		
Installation, maintenance, and repair occupations	Yes	5,230	5,230	52.4%	52.4%
	No	4,743	4,743	47.6%	47.6%
	Total	9,973	9,973		
Production occupations	Yes	7,000	7,000	28.2%	28.2%
	No	17,861	17,861	71.8%	71.8%
	Total	24,861	24,861		
Transportation and material moving occupations	No	3,823	3,823	0.0%	0.0%

Source: Union Membership and Coverage Database from the CPS, www.unionstats.com

Mr. POE. All right, thank you.

Mr. MALLINO. Just one. The energy sector is a good sector for the employment of union workers, there is no doubt about it. One of the reasons why we are here today is because the jobs that those energy jobs provide do give our members a number of very good, well-paying jobs.

Mr. POE. All right. Thank you.

I am going to yield 5 minutes to the vice chairman, Mr. Kinzinger from Illinois.

Mr. KINZINGER. Thank you, Mr. Chairman.

And thank you, gentlemen, for being here.

Illinois is fighting its own issue with the area of fracking. We have, I would say, terrible leadership in the State of Illinois that is very slow to react to changing circumstances, and I think we have a real opportunity to put a lot of good folks to work in Illinois and we have a lot of laborers in my district, a lot of union members in my district that would love the opportunity to be part of this energy renaissance. If anybody in Springfield is watching, hopefully they will be motivated by this hearing.

I want to be all in on this. I lean toward favoring this. But I do have a couple of questions. And these aren't like a lot of times in this when people lead you to answers to make a point. These are actual questions I have.

When we come to a world-priced commodity on this situation, right now there is a huge disparity between obviously what we are paying for natural gas here and what it is paid for overseas. If we increase our ability to export, and over time, over the next 10 or 20 years the infrastructure is built up in a big way and we can pretty much easily get this, what is to prevent our cost of natural gas from being married up and priced on the world market and married up with what they are paying in Europe and everywhere else?

I will start with you, Dr. Montgomery.

Mr. MONTGOMERY. What is going to prevent it is basically the cost of transportation. And we see this even in the United States where there is a difference of $1 or so between the price of gas in Texas and the price of gas in the Northeast, and that is actually changing as we have additional supplies being produced in the Northeast so that the transportation cost is narrowing.

But unless there is some huge innovation in the liquifaction technology, we have a cost of moving the gas by pipeline from the wellhead to the liquifaction facility. To recover the cost of capital, liquifaction costs several dollars a million BTU. It is expensive moving natural gas long distances by ship because of the fact that you have to use the natural gas for fuel because it is going to boil off from the ship.

But the point is, yes, there will be something like an irreducible $6 difference between the United States and the countries that it actually exports to because it takes that much to cover the cost of getting the gas from one to the other.

Now, if we had no capacity constraints, if we had enough capacity to serve all of the needs, we would find there would be some convergence, but that convergence would be so that the price in the receiving countries and the price in the exporting countries differed

by no more than that amount. That is, the rents that are being sought now by developers who think, hey, I can pay all that cost plus make a couple dollars, that would be competed away.

Mr. KINZINGER. So we are limited by our capacity. And so again the concern was, though, is what if we get in 10, 20, 30 years where our capacity is——

Mr. MONTGOMERY. Even if our capacity is unlimited it will still be necessary to pay that cost of shipping the gas.

Mr. KINZINGER. Gotcha.

Mr. MONTGOMERY. And the prices can't get any closer than that.

Mr. KINZINGER. Did you want to?

Mr. LEVI. I generally agree with what Dr. Montgomery has said. Some of those costs, if there is massive overinvestment, can ultimately be written off. Companies can go bankrupt and these facilities can still be operated. So in a situation where there was massive overinvestment you could have prices come closer together than the $6 differential. It is not zero. But that is possible. The thing that mitigates against it is that these are extremely expensive facilities, they take a very long time to build. And that gives a lot of time for them to fail.

Mr. KINZINGER. Briefly another subject is just simply on the national defense side of it. What would this do in Eastern Europe if we begin exporting natural gas. Theoretically, some of it goes to Eastern Europe. What does this do with Eastern Europe, for instance, for their relationship with us versus Russia. Does it shift that balance of power at all? I guess I will look at you, sir.

Mr. LEVI. I don't think it makes an enormous direct difference. I think the bigger question in Europe is whether Europeans on their own will be able to negotiate more flexible contracts with Russia. And the prospect of U.S. exports will be there as a threat if Russia wants to try and push for more favorable terms for itself, and I think that does help us and it will be appreciated.

Mr. KINZINGER. And very briefly, Mr. Mallano—did I say it right? Mallino.

Mr. MALLINO. It doesn't matter.

Mr. KINZINGER. Mallino. There you go.

Mr. MALLINO. I butcher your name all the time.

Mr. KINZINGER. I know. Everybody does.

Hey, just quickly, you had mentioned jobs in other sectors as well. Can you just expand on that a little bit, what it means to your folks?

Mr. MALLINO. And part of that is about finding kind of a sweet spot. I mean, we recognize that cheap gas can lead to a resurgence of manufacturing like we haven't seen, and while that will help our brothers and sisters in the manufacturing sectors and in those unions, constructing those facilities will also help us. And we know that there are a number of projects on the books, or at least in the planning phases, hopefully they get on the books, to build some new chemical facilities and others that we look forward to participating in.

So literally finding the right price, whether that is through market or through whatever, is important because we should be able to export gas, but we also need to keep enough of it here that we can bring those jobs back. You know from your district and your

State how important manufacturing jobs are. We are construction workers, but we want to see all sectors of the economy revitalized by this energy boon. We are an all-of-the-above union when it comes to energy. We don't think any type of energy should be advantaged over the others. We just want to see these jobs come back to the United States.

Mr. KINZINGER. Thank you. This was helpful.

And I yield back, Mr. Chairman.

Mr. POE. Thank you very much.

We will now hear from Mr. Vargas from California.

Mr. VARGAS. Thank you very much, Mr. Chairman.

My question is really about keeping natural gas cheap. I liked it when you talked about keeping it cheap. I liked that part of it. And that is my concern. If we get the idea to send it all overseas and we see it go up two, three, four times here, no one will think we were geniuses. No one will be thanking us for how quickly we went through this process, they will say what the hell did you guys do? Why did you double, triple, quadruple the cost of natural gas when it was so cheap? And that is my concern. So I want to ask you a little bit about that, if I could.

Now, I know gas a little bit better than natural gas. What is the price of gas, a gallon of gas in the United States, $3.60, $3.70 cents? Depends on where it is. In California it is four bucks because we have more of that EPA stuff. That is the truth. But you go to Europe, and how much is it in Belgium for a gallon of gas?

Dr. Levi or somebody who knows that?

Mr. LEVI. I haven't traveled to Belgium recently. It is much more expensive because of high taxes on gasoline.

Mr. VARGAS. Right. And in other places also because of transportation and other issues you have got gas that is two, three, four times as expensive, it seems, as gas here in the United States.

Mr. LEVI. We are talking about natural gas now?

Mr. VARGAS. No. No. No. I am talking about gasoline.

Mr. LEVI. Gasoline price differences in different parts of the world are primarily due to different levels of taxation on gasoline and to some degree due to the environmental requirements, just like the difference between California and other States.

Mr. VARGAS. But also production. So, for example, in Venezuela they are very cheap because that is what keeps that government afloat, right, because they have a whole bunch of it. And my concern is that right now it seems to be that we are producing a whole bunch of natural gas, and I think that that is fantastic, and I absolutely believe that we can do this safely. I mean, I think if you have unionized labor doing it, you know, with the PLA, they always do a good job. I mean, that is just the way it is. We develop standards.

My issue is with the cost, so if you could address that a little bit more, because I think it would be a terrible mistake if we rush this thing through and all of a sudden we double it. I mean, for some States it would be fantastic, I am sure, but for my constituents, they wouldn't be so excited about that.

Mr. MONTGOMERY. If I could just start. I think the primary determinant of the cost of natural gas is not going to be whether or not we are exporting it. It is the balance between supply and de-

mand in the United States. And I agreed with Mr. Bryngelson, right now we have a glut of natural gas. We have more production capacity and less demand than it takes to balance the market.

And most forecasts that I look at, including the most recent ones by EIA, have the price of natural gas going up in the United States, say, roughly doubling from its lowest point over the next 10 years or so simply because of domestic supply and demand, even if we don't allow any LNG exports at all. So that is the first point. We are in a time that consumers might as well enjoy, but that it is not the way the market is going to be over the next 10 years.

If we allow LNG exports, the exports are only going to occur if we have a willing buyer overseas. And I agree with Dr. Levi that if we have built lots of excess capacity we might find that there is a big demand for our gas. But over the next 10 years we are not going to have a great deal of capacity. We are not going to come close to the 20 TCF or two-thirds of U.S. gas production for which applications are in at DOE. The most that anyone I have talked to in the industry thinks it is feasible to do would be to build maybe a quarter of that, which means we might at most be able to export 5 trillion cubic feet out of production of 25. That leads to——

Mr. VARGAS. Before I think I may run out of time, let me—I like the explanation—but let me make sure everybody agrees with you.

Does anyone disagree that exporting some of this gas is not going to cause the price to go up here? Anyone disagree with that, or does everyone agree with that? Do you agree?

Mr. BRYNGELSON. I agree. I think it is a small enough portion of the market you won't see the effect, and you have got enough production out there that will ramp up and keep up with this. Right now prices are lower than the marginal cost to produce on a lot of the wells. You are seeing rig counts drop, production drop, and I think the market has got to equilibrate. But there is enough supply in the stack out there to meet the demand for the exports and the domestic market.

Mr. MALLINO. I was just going to say, Congressman, the one concern we have based upon other fights that we have been engaged in over job creation is that we know that some of the opponents of the export of natural gas don't really care about keeping prices cheap. They want to keep prices cheap to strand the resource, so that the resource isn't developed. And that is our concern from our perspective.

Mr. VARGAS. Okay.

Mr. MALLINO. We believe that natural gas can revitalize the industry, but we don't want it so cheap that it doesn't get developed.

Mr. LEVI. I think there is no question that prices would be slightly higher as a result of exports. If more people want to buy the same thing, it gets more expensive. But I don't think it is plausible that it would be three or four times more expensive because that would raise U.S. natural gas prices so much that no one would want to buy it anymore. So for exports to continue and drive prices up, U.S. prices can't get too high.

Mr. POE. The gentleman's time has expired.

Mr. VARGAS. I didn't hear the little buzzer. Sorry about that.

Mr. POE. We don't have a buzzer. It is on silent when your side is talking.

Mr. Weber, 5 minutes.

Mr. WEBER. Great. All right, I have Freeport LNG and Cheniere LNG on the edge of my district, the Gulf Coast of Texas. Judge Poe used to have it. Gentleman, which other product do we tell we don't want them shipping overseas because it might drive our prices up? Is it Apple? Is it Nike? Is it Ford? Who do we tell that to?

Mr. MALLINO. We actually bring Apple in from overseas.

Mr. WEBER. Well, they do have some products that they might distribute from overseas. The point is whatever the company is, I don't think we restrict any of them from sending overseas, do we, because it might drive prices up?

Mr. BRYNGELSON. Well, here is an interesting thing to look at. You can export the natural gas liquids you take out of the gas stream without a DOE export. The methane that is left you can't export. So to me that is a very odd situation for the same gas stream.

Mr. WEBER. Right. And I happen to have a little startup company in my district called Dow Chemical, and they have come out being opposed to exporting liquefied natural gas. But we did sign on a letter that we did support it.

Mr. Ratner, you made the comments that there were a lot of plants sitting around that had been set up to import natural gas that were sitting idle now and were regearing or retooling, if you will, for exporting natural gas, and they have got hundreds of millions, sometimes billions of dollars invested. We need to get this process done and over with so that those entrepreneurs, those private industries can export that gas.

And I would submit to you, and you all can argue with me if you want, we will go down the line here, that unleashing the energy industry would be a way to get more money into our economy, to get our economy refueled, no pun intended, and to get business going again. Those jobs created, they will have a multiplier effect. Talk to your chambers of commerce. They will plow money back into the economy. They will be paying taxes. In some instances many of those people will be off of the assistance rolls, so to speak.

Would any of you all argue with that? Mister, is it——

Mr. BRYNGELSON. Bryngelson.

Mr. WEBER. Bryngelson.

Mr. BRYNGELSON. No, I wouldn't argue with that a bit. There is quite a bit, all the local industries, local regions will benefit from the project.

Mr. WEBER. Okay. Dr. Montgomery?

Mr. MONTGOMERY. No, I agree completely.

Mr. WEBER. We will go on. I have 2 minutes left. Dr. Levi?

Mr. LEVI. Nationally there is a net benefit. Different regions will gain or lose, depending on what they do.

Mr. WEBER. Is it Mallino?

Mr. MALLINO. Yes, sir, we agree.

Mr. WEBER. Great.

Mr. RATNER. I agree as well.

Mr. WEBER. Glad to hear it. Let the record show it is unanimous.

Now, let me just say that, for Mr. Sherman's benefit, for coal, 1.07 pounds yields 1 kilowatt of energy, electricity. For natural gas, 0.00798 million cubic feet or 1,000 cubic feet yields 1 kilowatt. Re-

sidual fuel oil is 0.00184 barrels, it yields 0.8—it is 0.8 of a gallon of fuel oil. So there is your energy difference when you want to talk about where you get the most. I own an air conditioning company so we deal a lot with BTUs. When you deal with energy output and you are talking about heat content, British thermal units is the heat to raise 1 gallon of water, 1 pound per hour—1 pound of water, rather, 1 degree, 1 hour. Natural gas is a great, great fuel source, and I think you said that, Mr. Vargas, and we appreciate that.

So all in all, I think we should be moving toward exporting this, freeing them up so that our economy gets moving again. Can you give me any overriding economic reasons why we shouldn't? And I have got about 1½ minutes left.

Mr. BRYNGELSON. No, sir.

Mr. WEBER. He is easy.

Mr. MONTGOMERY. It is a very interesting intellectual challenge, but no, I can't.

Mr. WEBER. Good.

Mr. LEVI. I can't either.

Mr. WEBER. Great.

Mr. MALLINO. Again, we just want to make sure that there is a price point for which we have encouraged domestic manufacturing. But we believe that the export and that can be done simultaneously with each other.

Mr. WEBER. Great.

Mr. RATNER. As I said in my statement, I mean, there will be winners and losers in this. And so depending upon your perspective of where you are sitting will depend upon whether or not you support it.

Mr. WEBER. Okay. Thank you. I yield back 47 seconds.

Mr. POE. I thank the gentleman.

If the witnesses would bear with us, I think we are going to have another 3 minutes a round for the remaining members if they want to stay. Mr. Vargas, if you can stay. So I have a few questions as well.

Mr. Bryngelson, you work in the energy industry. I have heard anecdotal stories that the price of gas has gotten so low that people who produce, drill for natural gas, have quit drilling for gas and they have gone back to drilling for crude oil. What is your impression of that concept? Is that happening or not?

Mr. BRYNGELSON. Well, exactly what I hear in the industry is that they won't drill for dry gas. Now, some of the wet gas where they can pull the liquids, your ethanes, your propanes, your butanes and pentanes where there is more value, they will drill those, but the natural gas price now is not enough to encourage dry gas drilling.

Mr. POE. All right. My next question is, started out talking about the Department of Energy. What shall we do to move this process along? Suggestions?

Mr. BRYNGELSON. Well, I am a firm believer, and we saw this with the regasification projects looking to import, that the market is going to decide on these. We have seen this in other regions. Australia is an excellent one where you have multiple projects pro-

posed. Each one gets incrementally more expensive than the last until you get to an economic indifference point.

That is what is going to happen here. You won't have an infinite number of these plants built at the same level. Liquefaction may cost $3.00 on the first plant, it is at $3.10, $3.50 on the next, until you get to a point where the cost of liquefaction doesn't make sense and the market will say enough.

The problem is you can't predict which of these projects will go forward so you can't really pick the winners or losers. The market will ultimately decide. We saw that happen on the regasification side. Companies ended up with stranded assets that aren't being used. But those were on entrepreneurs, private industries. They didn't hit the ratepayers. Now they are trying to be reused.

So that is clearly my view on how this is going to work out and what the DOE needs to say is it is a market test.

Mr. POE. And a political question, Mr. Levi. Back in 2009, I think it was, the Russians shut off the gas to the Ukraine. I noticed it when I was there for the 13 days. I quickly left. It got cold in January. The concept, political economics if I can use that phrase, of expanding our natural gas resources to other countries, including Europe, does that help us politically, like the Ukrainians and our relationship with the former Soviet republics?

Mr. LEVI. It certainly does help us. Anything that gives consumers that we are friends or allies with more options in dealing with their traditional suppliers that use natural gas to exert political leverage helps them, and if they see us helping them, they tend to appreciate that. So I think it is a pretty straightforward equation on that front.

Again, I don't think it decisively changes things. The biggest change we have seen is that the United States is not an importer. As a result, big producers, Qatar in particular, have had surplus gas, they have dumped it on to the European market, and given our European friends and allies more options with Russia. Our entering the LNG export market would help continue that trend, but the big stimulus has already happened in a significant way.

Mr. POE. Very briefly, Mr. Ratner.

Mr. RATNER. Sir, there are just two points I would make. One is Europe has a lot of LNG import capacity. They use it to meet their peak demand in the winter, but they don't have a lot of storage, so they can't take in the gas during the rest of the season. So it is hard for them to necessarily use LNG to counter the Russians completely.

Mr. POE. Thank you.

Mr. BRYNGELSON. Mr. Chairman, would you indulge me for a second because I have a good bit of information on this. Our company was set up to find new markets for liquefied natural gas and we focused on Europe and Gazprom here. And that is one small bit of the equation. Right now we are developing projects to bring LNG into Pakistan, Egypt, Indonesia, Bahrain. We are working on building one in the Emirates. We have a project in Kuwait where we are actually bringing LNG into these countries from other sources, from Nigeria, from Trinidad. It could be the U.S.

And these aren't theoretical. These are projects that exist today. Twenty-five percent of the gas on a cold winter day that goes into

Argentina flows across our ships, about the same on our largest vessel we have in Brazil. We have a project in Israel. As I said, Kuwait. We have one in the U.K., we had two in the U.S.—one we have shut down. But our list goes on from here. There are markets out there we are developing and it is other peoples' LNG.

And one of the things we try to do is to see ways we can get the U.S. behind us supporting our push for a U.S. company going in and keeping things happening. Pakistan. We would love to bring LNG there and not have the Iranian pipeline built. That could easily be U.S. LNG going in there.

So these aren't theoretical markets. These are real markets we are developing today.

Mr. POE. Thank you.

I yield to the ranking member.

Mr. SHERMAN. Mr. Bryngelson, you may have misspoken if you said you were going to import natural gas to Kuwait.

Mr. BRYNGELSON. We have actually been importing. This is our fifth year of LNG imports.

Mr. SHERMAN. Of taking natural gas, and instead of piping it from Qatar you are liquefying it and then taking it over to Kuwait?

Mr. BRYNGELSON. In our case, for that process, we are not liquefying, but our vessels deliver regasified LNG into Kuwait.

Mr. SHERMAN. The idea of carting coals to Newcastle is illustrated here. It surprises me that Kuwait simply wouldn't use petroleum to meet its energy needs. They seem to have a lot of it. That is an idiosyncrasy that I just want to——

Mr. BRYNGELSON. Certainly. Certainly I can tell you exactly why they do it, though.

Mr. SHERMAN. Now, the other thing I will kind of disagree with you on is, this is conjecture, and that is you put forward the idea that the cost of liquification would go up with each new plant. It is the experience of most of us that as new technologies are developed costs go down, that the tenth plant built in the United States will be better designed and have better technology. I can't see a reason why a plant built 10 miles away from another plant is going to have higher costs when it has all the experience of the older plant.

I want to get to just nail down some numbers here. Mr. Ratner, what is the cost per MCF in Texas or the hub of natural gas. What is the price now?

Mr. RATNER. The Henry Hub right now I think is about 4-something.

Mr. SHERMAN. 4-something. Now, we have heard testimony here that the effect of exporting would be to increase that by between 50 cents and $1. Dr. Montgomery, Dr. Levi, I think that is consistent with your testimony. You can just nod or let me know.

Mr. LEVI. At the high end.

Mr. SHERMAN. Okay.

Mr. LEVI. I think we don't know how much capacity will be built.

Mr. SHERMAN. So if we are going to go back to our constituents, it is 50 cents or $1, although it is really not a quarter of the cost they are paying, because most of what they are paying is for the shipping, the billing process, the utility, et cetera.

Mr. Levi, if it was $1 per MCF, on a basis of $4, what am I going to pay extra for cooking, 10 percent more or 20 percent more?

Mr. LEVI. I will be pleased to do the math and get back to you.

[The information referred to follows:]

WRITTEN RESPONSE RECEIVED FROM MICHAEL A. LEVI, PH.D., TO QUESTION ASKED DURING THE HEARING BY THE HONORABLE BRAD SHERMAN

You are correct: the ultimate impact on delivered natural gas prices would likely be 10 percent or less.

Mr. SHERMAN. That really is a question about what percentage of what I pay my gas company is for the gas at the Texas price and what percentage—I don't know if Mr. Ratner——

Mr. LEVI. I can give you one estimate from a study that I published last year looking at what would happen to household bills if prices went up by $1, and what I found was that for the lowest 10 percent of household income earners, it would increase annual bills by about $50 a year if you combined electricity and home heating costs, and for sort of the median user it would be about $100 a year at that upper range.

Mr. SHERMAN. And those median users tend to live in the colder parts of America where an awful lot more natural gas is used. And I don't think it would be that high in our area. And then I think the testimony has been that the cost to liquify and ship combined is roughly $6 an MCF, is that correct? I am seeing one panelist nod.

Mr. BRYNGELSON. Yes.

Mr. SHERMAN. I see another. Okay. So basically our manufacturers would have a $6 cost advantage on a product that costs $4, so they would be paying less than half of what the rival manufacturer would pay.

Finally, and I know nobody has commented on this, when fracking technology hits the Eurasian landmass, is there going to be a lot more natural gas there so they won't need ours? Dr. Montgomery?

Mr. MONTGOMERY. I spent the beginning part of last week at a conference that was dealing exactly with this issue, and I am not sure I would call it a consensus, but the strong opinion of geologists and production companies and oil field services companies was not likely; that China has a very different kind—I mean, you can call it shale, but shale covers a multitude of sins—that it is a very different kind of resource than the U.S. There has only been, like, 20 wells punched there into shale to test it. And so the opinions ranged from we simply don't have any evidence that it is there to what we do know——

Mr. SHERMAN. That is China. Russia already creates a whole lot of natural gas. When they get our fracking technology, can they double or triple their production?

Mr. MONTGOMERY. Russia, less clear. They apparently do have resources that are susceptible to fracking.

Mr. SHERMAN. Okay. I yield back my negative time.

Mr. POE. Mr. Weber, do you have some more questions?

Mr. WEBER. I do. And I am sorry, I never turned my mike off.

China, you mentioned 20 holes, Dr. Montgomery. I have heard that China is beginning to discover shale plays out in the western part of China but that they don't have infrastructure out there and it is not near their population centers. So their challenge is to be able to get that infrastructure in place and to get that natural gas to where the people can use it as quickly and as affordably as possible.

What kind of window do we have for our exporters to really get out there and seize on this market opportunity? Would you say 1 year, 2 years, 3 years, 8 years? Any guesses, Mr. Bryngelson?

Mr. BRYNGELSON. Well, my view on timing is not so much driven by the shale gas plays because a lot of the customers we deal with, potential customers, are looking for diversity of supply just as much as they are anything else in sourcing from the U.S. I think it is more of an issue of how quickly the other projects move along, and our biggest competitive threats are places like Mozambique and Tanzania with large finds there and the Eastern Mediterranean. So in my view this is something in the next year to 18 months this gets decided, if not before that. So we don't have a lot of time.

Mr. MONTGOMERY. In our analysis we did not include a lot of increased demand for gas from China, so I guess in that sense we were assuming that China would in one way or another either satisfy its needs or be able to get gas more economically from elsewhere. So I am not sure that that is the market that is going to be driving the growth of U.S. exports.

Mr. WEBER. You don't think it plays.

Mr. LEVI. I tend to agree Japan and Korea are more likely large markets. No one is going to build a multibillion-dollar facility on an expectation that they will make money for a year or 2. If they are doing it, it is because they hope to make money over a decade or more.

Mr. WEBER. Well, and supply their people with gas, obviously.

Mr. LEVI. Yes. And so the focus will be on this long-term payoff. The near-term question is, can you get those Japanese and Korean contracts, because for a lot of producers that is what their bankers want to see.

Mr. WEBER. That is the window.

Mr. Ratner?

Mr. RATNER. The only thing I would add regarding China, I mean, they are the only country that I have heard could rival the U.S. as far as quantity, but getting the gas out is going to be a lot more difficult.

Mr. WEBER. That is their challenge.

Mr. RATNER. Yeah. And besides the infrastructure, there is no water out in western China to frack.

Mr. WEBER. All right. Thank you. I yield back.

Mr. POE. Thank the gentleman.

Mr. Vargas from California.

Mr. VARGAS. Mr. Chairman, thank you very much. Now that I get to go after my good friend from Texas, I can brag about a California company in San Diego, and that is Sempra, Sempra Energy, a very responsible company, very responsible both environmentally and I think with its workers it has done a pretty good job. And I

know that they are looking at this opportunity, and I got a chance to speak to them about it.

The issue, though, that now does concern me is the math, the math part. And the reason the math concerns me is because it doesn't get really cold in California but it gets really hot, and as my friend Sherman told me, of course, we use that to fire up our electrical plants and produce energy.

So I think that is one of the things that I think we have to nail down the math to figure out how much is it going to cost us if we do export it. I mean, there seemed to be some agreement there are going to be winners and losers. I just hate to be on the losing side of things. When I was in California the Democrats were on the winning side. Here we are on the losing side. So that is why it makes a difference.

And I would like to know the math a little bit, and I hope you guys do work on that. Thank you.

Mr. MONTGOMERY. Could I just comment on that, because we did have a lot of math in our report. And I think you are absolutely right that natural gas prices are very important for electricity prices in California. Pretty much natural gas prices California electricity. But we did take that in account, at least in the work that we were doing because we have a comprehensive model.

But I think I did a disservice in the way I wrote the report we did for DOE in talking about winners and losers in terms of consumers and producers, because it is always going to look like there is a loss if you only look at one slice of the economy whenever you are talking about a trade issue, because the benefits that we get from trade are those that come from our export earnings, but they are also because those mean that we can import more things that we can——

Mr. VARGAS. You know, I am familiar with that. I went to school in Boston, I went to law school, and I got a chance to go to Worcester, and they would probably argue that some of the exports there hurt them because they had all those facilities. If you go there now there are old brick buildings with nothing in them.

Mr. MONTGOMERY. Well, that is another case. But the point being that we need to look at a comprehensive picture. My opinion now is that the winners and losers are shareholders in companies that are going to be producing natural gas, building the infrastructure in natural gas, and the workers in those industries. The losers are largely going to be shareholders in some chemical industries and some other energy-intensive industries. Somebody who has a Standard & Poor's 500 portfolio is going to come out ahead because quantitatively the gains on the gas side are going to be——

Mr. VARGAS. Right. I know my time is probably over. But it is the $100 more per resident in California that I am concerned about.

Mr. MONTGOMERY. Yes, but a lot of those California residents are going to be participating in their other sources of income in the gains that come from trade. That is the picture that needs to go together.

Mr. RATNER. If I could add just one quick comment to that, one thing to keep in mind, whether exports are allowed or not—well, if exports aren't allowed and the manufacturing renaissance hap-

pens, that will be an additional source of demand which will also drive domestic prices up. So there is no reason necessarily to believe that if we don't allow exports that prices are going to stay low. There have been a lot of projects that have been announced and if those get built the increase in demand will also raise prices domestically.

Mr. VARGAS. Thank you, Mr. Chairman. I know I went over. Thank you, sir.

Mr. POE. I thank the panelists for being here—your information was very valuable—and also to our committee members. So the committee is adjourned. Thank you very much.

[Whereupon, at 3:45 p.m., the subcommittee was adjourned.]

APPENDIX

Material Submitted for the Hearing Record

SUBCOMMITTEE HEARING NOTICE
COMMITTEE ON FOREIGN AFFAIRS
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, DC 20515-6128

Subcommittee on Terrorism, Nonproliferation, and Trade
Ted Poe (R-TX), Chairman

April 23, 2013

TO: MEMBERS OF THE COMMITTEE ON FOREIGN AFFAIRS

You are respectfully requested to attend an OPEN hearing of the Subcommittee on Terrorism, Nonproliferation, and Trade, to be held in Room 2200 of the Rayburn House Office Building (and available live on the Committee website at www.foreignaffairs.house.gov):

DATE: Thursday, April 25, 2013

TIME: 2:00 p.m.

SUBJECT: Natural Gas Exports: Economic and Geopolitical Opportunities

WITNESSES: Mr. Rob Bryngelson
Chief Executive Officer
Excelerate Energy

W. David Montgomery, Ph.D.
Senior Vice President
National Economic Research Associates

Michael A. Levi, Ph.D.
Director
Program on Energy Security and Climate Change
Council on Foreign Relations

Mr. David Mallino Jr.
Legislative Director
Laborers International Union of North America.

Mr. Michael Ratner
Specialist in Energy Policy
Congressional Research Service

By Direction of the Chairman

The Committee on Foreign Affairs seeks to make its facilities accessible to persons with disabilities. If you are in need of special accommodations, please call 202/225-5021 at least four business days in advance of the event, whenever practicable. Questions with regard to special accommodations in general (including availability of Committee materials in alternative formats and assistive listening devices) may be directed to the Committee.

COMMITTEE ON FOREIGN AFFAIRS

MINUTES OF SUBCOMMITTEE ON *Terrorism, Nonproliferation, and Trade* HEARING

Day *Thursday* **Date** *04/25/13* **Room** *RHOB 2200*

Starting Time *2:13* **Ending Time** *3:45*

Recesses *NA* (____to ____) (____to ____) (____to ____) (____to ____) (____to ____) (____to ____)

Presiding Member(s)

Chairman Ted Poe

Check all of the following that apply:

Open Session [✓]
Executive (closed) Session [ ]
Televised [✓]
Electronically Recorded (taped) [✓]
Stenographic Record [✓]

TITLE OF HEARING:

Natural Gas Exports: Economic and Geopolitical Opportunities

SUBCOMMITTEE MEMBERS PRESENT:

Reps. Poe, Sherman, Kinzinger, Yoho, Cook, Vargas, Kennedy, and Lowenthal

NON-SUBCOMMITTEE MEMBERS PRESENT: *(Mark with an * if they are not members of full committee.)*

Reps. Weber and Rohrabacher

HEARING WITNESSES: Same as meeting notice attached? Yes [✓] **No** [ ]
(If "no", please list below and include title, agency, department, or organization.)

STATEMENTS FOR THE RECORD: *(List any statements submitted for the record.)*

Questions for the Record from Rep. Poe
Questions for the Record from Rep. Sherman

TIME SCHEDULED TO RECONVENE _____
or
TIME ADJOURNED *3:45*

Subcommittee Staff Director