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LNG TRANSPORTATION

HEARING

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED THIRTEENTH CONGRESS

SECOND SESSION

TO

HARNESS A GAME-CHANGING RESOURCE FOR EXPORT,DOMESTIC CONSUMPTION, AND TRANSPORTATION FUEL

JUNE 19, 2014

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LNG TRANSPORTATION

THURSDAY, JUNE 19, 2014

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 2:33 p.m. in room SD–366, Dirksen Senate Office Building, Hon. Mary L. Landrieu, chair, presiding.

OPENING STATEMENT OF HON. MARY L. LANDRIEU, U.S. SENATOR FROM LOUISIANA

The CHAIR. Good afternoon, everyone. Thank the members for their attendance.

We're expecting the ranking member shortly. She's on the Floor. So we're going to go ahead and get started.

Thank you all for joining us today for our hearing on natural gas, "How to Harness a Game-changing Resource for Export, Domestic Consumption, and Transportation Fuel." I might add for American energy security.

We have an expert witness of—panel of witnesses today. I'll introduce them in just a moment.

I'm going to start with a brief opening statement and then recognize my ranking member, if she's here, when she arrives. Then ask Senator Udall for a brief opening statement. Then we'll go to our panel.

Senator Manchin also has a time constraint. So he may want to be recognized. I thank you all very much. I thank Senator Udall for having a bill that's pending before our committee.

We will be discussing it and others today, gathering information. Then at some time when the debate is thorough we will look forward to having a mark up on that bill. I thank him for his leadership.

Let me begin by saying what do I mean by game-changing resource? According to the Energy Information Agency new technology has secured an abundant supply of natural gas for almost the next 100 years. According to the Center for Climate and Energy Solutions, increased use of natural gas has lowered our CO_2 emissions to their lowest level in 20 years.

It's interesting that 144 years ago on a windy night in Shreveport, Louisiana a night watchman was monitoring a water drilling operation when he struck a match expecting the wind to quickly blow it out. But instead, much to his surprise, it kept burning. It was fueled by an unexpected source, natural gas.

This match literally ignited an energy and economic pilot light that has been burning ever since in Northwest Louisiana and throughout other parts of Louisiana, the South and throughout the United States providing a cleaner, cheaper and more abundant source of energy for our country. Neither that night watchman or William Hart, who drilled the first natural gas well, 45 miles south of Buffalo in New York in 1821, could have envisioned how this resource would expand our Nation's opportunities for job creation and energy security in the 21st century.

Just a short 10 years ago it literally appeared that our Nation would continue a 30 year period of stagnant production of natural gas. Production was not increasing at the rate necessary to meet the rising demand for energy. As usual, though, private industry stepped in with huge investments to construct natural gas import terminals.

But to the amazement of almost everyone in the industry and the government alike, extraordinarily swift advances in technology would develop to locate, capture andproduce natural gas. So that we now have the opportunity to turn what were proposed import terminals into export terminals, while also ensuring that hundreds, if not thousands, of domestic manufacturers continue to have an abundant source of energy that allows them to compete favorably abroad.

I believe we can harness this resource to create tens of thousands of high paying jobs, position America as an energy superpower, support our allies abroad whether in Europe, the Mideast, Asia or in Africa. Prices have fallen to some of their lowest levels since the 1980s when demand for natural gas first began to rise. Instead of peaking at$15 per thousand cubic feet as some predicted and as Japan is currently experiencing, natural gas prices at the U.S. are at $4.50/thousand cubic feet, some of the lowest prices in the entire world.

Do we want to give up this advantage? Absolutely not.

Do we have the capacity to power our exports while keeping prices relatively low? The evidence suggests we can.

A 2012 report commissioned by the Department of Energy and conducted by National Economic Research Association, a private sector firm, found that we could responsibly export 12 BCF a day of natural gas to the world market and maintain adequate supplies to fuel our growth at home. This study was also updated this year and has found, as with this process is so dynamic, that that number is growing.

Right now DOE is doing yet another update for us to use as a guide. Some estimates say that we could responsibly export up to 20 BCF a day. That number may go up. It may go down. The hearing today is to find out what our capacity is.

Today DOE has issued a final approval for one export facility. That is Cheniere which is located 15 miles south of Vinton, Louisiana to export 2.2 BCF a day of the 12 that has been authorized or suggested.

Earlier today the Federal Energy Regulatory Commission issued a final citing for Sempra, the Cameron LNG facility in Hackberry, Louisiana on the banks of Black Lake. Once it receives its final

DOE approval which we expect will be very soon, Sempra will export 1.7 billion BCF a day. That is 4.0 BCF total.

Just a few weeks ago DOE took the right step to simplify the approval process to separate the wheat from the chaff. In other words helping us to find out what projects are really likely to go, what are unlikely to go. What is the real queue and what is the conjecture queue?

I look forward to hearing additional testimony from Mr. Smith to help us clarify that. It's one of the questions that I'll be pressing on today because there seems to be figures being thrown all over this capital. I think it's important for our committee to know what the real facts are.

Today's hearing will also examine other ways we can support the most viable projects including several bills that Senator Udall has and that I am supporting. Senator Udall's bill will shorten the DOE review process to 45 days. We'll talk about the advantages of that.

I would like now to turn to my colleague for her opening statement if she wants a minute. If you're ready?

OK, I'll turn to Senator Murkowski for her opening statement. I thank you very much for planning this hearing with me. We look forward to hearing from our witnesses.

Thank you for your leadership, Senator.

STATEMENT OF HON. LISA MURKOWSKI, U.S. SENATOR FROM ALASKA

Senator MURKOWSKI. Thank you, Madame Chair.

Appreciate the attention to, I think what we would all agree, is a very important issue. As we perform our function here on the committee and that is one of oversight. We don't do near enough of it in this Senate, I think, when we think about the oversight issues. So the opportunity to focus on it today is appreciated.

This hearing is being held in the midst of geopolitical turbulence. Ukraine is in turmoil. Iraq is on the brink. Energy is never far from any of these discussions.

Our rising production gives us the opportunity to satisfy our own needs here at home and to help our friends and allies around the world to play a constructive role in global energy markets as a leader and not merely an importer.

But unplanned disruptions are real.

According to the EIA last May saw 1.4 million barrels per day offline in Libya.

Two-hundred and eighty-six thousand barrels per day offline in Nigeria.

Some 370,000 in Iraq.

One hundred and thirty thousand in Yemin.

One hundred and twenty thousand in South Sudan.

Two hundred and ninety thousand in Syria.

This all adds up to a frightening number mitigated by one factor alone and that's rising U.S. oil production brought to you by technology, sound state policies and true American grit.

These same forces have also delivered a renaissance in natural gas where global markets may not be as developed, but are developing rapidly. Last December I wrote the President. I asked him

to consider the geopolitical impacts of U.S. oil and gas production as his Administration prepared the forthcoming national security strategy. I still believe that. I believe that events that have transpired since then have highlighted the importance of the national security aspects of production and exports in both oil and natural gas.

Yet here we are once again approaching LNG exports like there's some hypothetical enterprise as if we still need more time to weigh our options. I have weighed the options. I have looked at the evidence. I've attended multiple hearings about this issue.

I think it's time that we move beyond the speculation. Get to the business of nuts and bolts governance of implementation of actually getting things done rather than endlessly wringing our hands and falling prey to special interests and idiology.

I have long advocated for expediting the process for Federal approvals of LNG exports. I did so in a white paper that we published last August. I reiterated that call this past January at the Brookings Institute.

I have reached out to the Administration hoping to find ways, that we here in the Senate, can help grant but I think these no brainer approvals on a timely basis. So if I've got one goal at this hearing it is this. That is to establish that there are reasons for optimism about this new procedural change at the DOE. But that there are also reasons for skepticism.

It does have my cautious support. But I think time will tell on this. As the proposal is implemented I want to be watching carefully.

I believe it's also time for us to consider legislation that would bring certainty to the pace of final approvals. While this proposal would clean up the conditional licensing queue. The mechanics of final licensing remain murky, especially in regards to timings.

So Madame Chairman, know that I am committed to working very, very, very hard to see final approvals this year. Know that working with you we can encourage in the right direction.

So I'm pleased to have the witnesses before us and look forward to their comments here this afternoon.

The CHAIR. Thank you very much.

Because it's Senator Udall's bill that's going to be talked about generally, would it be appropriate to ask the Senator to make just brief remarks now and then we'll hear from our panel and go to questions.

Is that OK with the other members?

Senator.

STATEMENT OF HON. MARK UDALL, U.S. SENATOR FROM COLORADO

Senator UDALL. Thank you, Madame Chair.

I too want to acknowledge the witnesses.

Thank you for having a hearing on such an important topic which is natural gas development across the U.S. As we've heard and as the chair and the ranking member and I think the committee in its entirety know, our Nation's clean burning and job creating natural gas willplay an important role in strengthening energy security both at home and abroad. The ongoing crisis in

Ukraine and Russia's recent announcement just this week to cutoff natural gas supplies shows why we need to responsibly develop our natural gas reserves and expand our capacity to develop and deliver this domestic resource to the market both American and the global market.

Of course, this would also bring economic benefits at home. In fact just today we learned that Colorado's Weld County, which is the Northeastern plains of my State, had the largest percentage increase in employment in the U.S. in 2013 due in part to oil and gas development. This shows how oil and gas has been and will continue to be a critical part of our economy, which is why I support safe and responsible development of these resources.

So in that vein I was pleased with the Department of Energy's recently announced proposal to streamline its natural gas export review process, effectively trimming 2 regulatory steps into one smooth process. I've been proud to lead the bipartisan effort to push this Administration to cut red tape and speed up the process.

That said, I do think Congress has a role here as well. That's why I'm going to continue to work on legislation to provide more certainty to the Department of Energy process. I'm pleased to be working with the chair on this effort. I also heard the ranking member call for more certainty as well.

So in that vein we introduced legislation yesterday that will put a timeline on DOE to make its final decision on public interest for LNG export applications. Something that Mr. McNally suggested in his testimony.

This bill also creates a path for judicial review if DOE doesn't make a timely decision and requires public disclosure of where the natural gas is exported so that all Americans will know where our gas is going. I have to tell you I think this is a solution that works for all stakeholders by ensuring a timely decision for projects while still allowing for the technical analysis needed to make a good decision.

I look forward to continuing to work with Energy Secretary Moniz as well as Deputy Principal Assistant Secretary Chris Smith, from whom we will hear today to take full advantage of responsibly utilizing our vast natural gas resources for both domestic consumption and export to global markets.

Thank you again, Madame Chair, for holding this hearing. Of course, I'm really eager to hear what our witnesses have to say.

Thank you.

The CHAIR. Thank you very much.

Let me quickly introduce our panelists, ask them to begin their remarks and then we'll go through a round of questioning with those that are here.

First, we welcome Chris Smith back to our committee. He is the Principal Deputy Assistant Secretary for Fossil Energy at the Department of Energy. His office oversees fossil energy research, development, encompassing coal, oil and natural gas.

Next, Mr. Robert McNally is the founder and President of the Rapidan Group and a leading consultant regarding energy markets and policy in the Nation.

Next we have Mr. Dan Weiss, Senior Fellow at the Center for American Progress, who leads the Center's Energy and Climate Advocacy Campaign.

Next we have Mr. Marty Durbin, CEO of America's Natural Gas Alliance.

Finally we have Miss Elizabeth Rosenberg, Senior Fellow and Director of Energy, Environment and Security Program at the Center for a New American Security.

We thank you all for being here.

Mr. Smith, we'll start with you. I know you have some prepared remarks and please leave them to 5 minutes or less.

[Laughter.]

STATEMENT OF CHRISTOPHER SMITH, PRINCIPAL DEPUTY ASSISTANT SECRETARY OFFICE OF FOSSIL ENERGY, DEPARTMENT OF ENERGY

Mr. SMITH. Or less.

Thank you very much, Chair Landrieu and Ranking Member Murkowski and members of the committee.

I appreciate the opportunity to discuss the Department of Energy's program regulating the export of natural gas including liquefied natural gas. I want to give my thanks to all the members of the committee for the leadership that you've shown in this important policy area.

The development of U.S. natural gas resources is having a transformative impact on the U.S. energy landscape helping to improve our energy security while spurring economic development and job creation around the country. The Administration continues to take steps to ensure the safe and environmentally sustainable supply of natural gas. Since receiving the first long term application in 2010 to export LNG to non-FTA countries from the lower 48 States, the Department of Energy has been and remains committed to conducting a public interest determination process as required by the Natural Gas Act that is expeditious, judicious and fair.

Throughout this time the Department has consistently made clear that a close monitoring of market developments plays a critical role in the Department's decisionmaking process. On May 29th of this year in order to reflect a changing market dynamics the Department of Energy proposed to suspend the practice of issuing conditional authorizations and review applications and make final, public interest determination only after completing the review required by environmental laws and regulations.

The proposed changes to the manner in which LNG applications are ordered and processed ill ensure our process is efficient by prioritizing resources on the more commercially advanced projects while also providing the Department with more complete information when applications are considered and public interest determinations are made.

When the Department began issuing conditional authorizations to export LNG to non-FTA countries in 2011 applicants were asking for some signal of regulatory certainty before spending significant resources to develop their projects. Since that time applicants have begun to spend significant time and resources to complete NEPA review prior to receiving conditional authorization from the

Department of Energy. Indeed, applicants are spending tens of millions of dollars on pre-fee and feed for NEPA review as well as negotiating contracts and financing.

In response to these and other developments the Department intends to make final public interest determinations only after projects have completed the NEPA process instead of issuing conditional authorizations. While our moving them to intermediate step of conditional decisions and setting the order of DOE decision-making based on readiness for final action, the Department will prioritize resources on the more commercially advanced projects.

The proposed procedural change will improve the quality of information on which DOE makes its public interest determinations. By considering for approval those projects that are more likely to actually be constructed, the Department will be able to base its decision on a more accurate evaluation of the project impact on public interests. The Department will also be better positioned to judge the cumulative market impact of its authorizations and its public interest review.

While it is not assured that all projects for which NEPA review is completed will be financed and constructed. Projects that have completed NEPA review are, generally speaking, more likely to proceed than those that have not.

In response to an evolving market this proposed change will streamline the regulatory process for applicants, ensure that applications, applications that have completed the NEPA review, will not be delayed by their position in the current order of precedence and give the Department a more complete understanding of project impacts. The Department issued the notice of proposed procedures for LNG export decisions for a 45 day public review and comment period. During this review period the Department will continue with evaluations of projects that have already received conditional authorizations and completed their NEPA review.

Further, the Department will continue to act on requests for conditional authorizations currently under review during the period in which the proposed changes are under consideration.

In addition to the proposed procedural change, the Department announced plans to undertake an economic study in order to gain a better understanding of how potential U.S. LNG exports between 12 and 20 billion cubic feet per day could affect the public interest. The study will be made available for public comment.

Finally, to better inform the Department and the public on the environmental impacts of increased LNG exports, the Department elected to prepare 2 additional reports for—on environmental issues.

The first report reviewed unconventional natural gas exploration production activities. In keeping with the President's Climate Action Plan and the Administration's commitment to mitigate greenhouse gas emissions the Department completed a second report on life cycle greenhouse gas emissions. Both reports are being made available for public comment for 45 days after which the reports and comments received from the public will be considered by the Department in its public interest determination in connection with applications to export LNG to non-FTA countries.

In conclusion, Madame Chair, I would like to emphasize that the Department is committed to moving this process forward as expeditiously as possible. We understand the significance of this issue as well as the importance of getting it right.

Thank you very much.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF CHRISTOPHER SMITH, PRINCIPAL DEPUTY ASSISTANT SECRETARY OFFICE OF FOSSIL ENERGY, DEPARTMENT OF ENERGY

Thank you Chair Landrieu, Ranking Member Murkowski, and Members of the Committee. I appreciate the opportunity to be here today to discuss the Department of Energy's (DOE) program regulating the export of liquefied natural gas (LNG).

Recent Developments in LNG Exports

The boom in domestic shale gas provides unprecedented opportunities for the United States. Over the last several years, domestic natural gas production has increased significantly, outpacing consumption growth, resulting in declining natural gas and LNG imports. Production growth is primarily due to the development of improved drilling technologies, including the ability to produce natural gas trapped in shale gas geologic formations.

Historically, the DOE has played an important role in the development of technologies that have enabled the United States to expand development of our energy resources. Between 1978 and 1992, public research investments managed by the Department contributed to the development of hydraulic fracturing and extended horizontal lateral drilling technologies that spurred private sector investments and industry innovation, unlocking billions of dollars in economic activity associated with shale gas.

Today, domestic natural gas prices are lower than international prices of delivered LNG to overseas markets. As in the United States, demand for natural gas is growing rapidly in foreign markets. Due primarily to these developments, DOE has received a growing number of applications to export domestically produced natural gas to overseas markets in the form of LNG.

DOE's Statutory Authority

DOE's authority to regulate the export of natural gas arises under section 3 of the Natural Gas Act (NGA), 15 U.S.C. §717b. This authority is vested in the Secretary of Energy and has been delegated to the Assistant Secretary for Fossil Energy.

Section 3(a) of the NGA sets forth the standard for review of most LNG export applications:

> [N]o person shall export any natural gas from the United States to a foreign country or import any natural gas from a foreign country without first having secured an order of the [Secretary of Energy] authorizing it to do so. The [Secretary] shall issue such order upon application, unless after opportunity for hearing, [he] finds that the proposed exportation or importation will not be consistent with the public interest. The [Secretary] may by [the Secretary's] order grant such application, in whole or part, with such modification and upon such terms and conditions as the [Secretary] may find necessary or appropriate.

Section 3(a) thus creates a rebuttable presumption that a proposed export of natural gas is in the public interest. Section 3(a) also authorizes DOE to attach terms or conditions to the order that the Secretary finds are necessary or appropriate to protect the public interest. Under this provision, DOE performs a thorough public interest analysis before acting.

In the Energy Policy Act of 1992, Congress introduced a new section 3(c) to the NGA. Section 3(c) created a different standard of review for applications to export natural gas, including LNG, to those countries with which the United States has in effect a free trade agreement requiring the national treatment for trade in natural gas. Section 3(c) requires such applications to be deemed consistent with the public interest, and requires such applications to be granted without modification or delay.

Free Trade Agreement (FTA) Countries

There are currently 18 countries with which the United States has in place free trade agreements that require national treatment for trade in natural gas for pur-

poses of the Natural Gas Act. These 18 countries include: Australia, Bahrain, Canada, Chile, Colombia, the Dominican Republic, El Salvador, Guatemala, Honduras, Jordan, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, Republic of Korea, and Singapore.

There also are two countries—Israel and Costa Rica- that have free trade agreements with the United States that do not require national treatment for trade in natural gas for purposes of the Natural Gas Act.

Because complete applications under section 3(c) must be granted without modification or delay and are deemed to be in the public interest, DOE does not conduct a public interest analysis of those applications.

DOE Process to Review Applications to Export LNG to non-FTA Countries

DOE's review of applications to export LNG to non-FTA countries is conducted through a public and transparent process. Upon receipt of an application, DOE issues a notice of the application in the Federal Register, posts the application and all subsequent pleadings and orders in the proceeding on its website, and invites interested persons to participate in the proceeding by intervening and/or filing comments or protests. Section 3(a) applicants are typically given an opportunity to respond to any such comments or protests and, after consideration of the evidence that has been introduced into the record, DOE issues an order either granting the application as requested, granting with additional terms or conditions, or denying the application.

Under the Natural Gas Act, DOE's orders are subject to a rehearing process that can be initiated by any party to a proceeding seeking to challenge DOE's determinations. Court review is available as well after the rehearing process is exhausted.

Public Interest Criteria for NGA Section 3(a) Applications

For applications requesting authority to export LNG to countries that do not have free trade agreements requiring national treatment for trade in natural gas, DOE conducts a full public interest review. While section 3(a) of the NGA establishes a broad public interest standard and a presumption favoring export authorizations, the statute neither defines "public interest" nor identifies criteria that must be considered. In prior decisions, however, DOE/FE has identified a range of factors that it evaluates when reviewing an application for export authorization. These factors include economic impacts, international impacts, security of natural gas supply, and environmental impacts, among others. To conduct its review, DOE/FE looks to record evidence developed in the application proceeding. Applicants and interveners are free to raise new issues or concerns relevant to the public interest that may not have been addressed in prior cases.

Jurisdiction over the LNG Commodity Export Versus the LNG Export Facility

DOE exercises export jurisdiction over the commodity (natural gas), whereas other Federal, state, and local organizations have jurisdiction over the facilities used in the import or export of the commodity, depending on the facility location.

The Federal Energy Regulatory Commission (FERC) is responsible for authorizing the siting, construction, expansion, and operation of LNG import and export terminals. FERC may approve those applications in whole or in part with such modifications and upon such terms and conditions as it finds necessary or appropriate.

The U.S. Department of Transportation's Maritime Administration (MARAD) is responsible under the Deepwater Port Act of 1974, as amended, (33 U.S.C. § 1501 et seq.) for the licensing system for ownership, construction, operation and decommissioning of deepwater port structures located beyond the U.S. territorial sea, including deepwater LNG export facilities.

Sabine Pass Authorization—First Long-Term LNG Export Authorization

DOE granted the first long-term application to export domestically-produced lower-48 LNG to non-FTA countries to Sabine Pass Liquefaction, LLC, (Sabine Pass) in DOE/FE Order Nos. 2961 (May 20, 2011), 2961-A (August 7, 2012), and 2961-B (January 25, 2013). The LNG export volume authorized is equivalent to 2. 2 billion cubic feet per day (Bcf/d) of natural gas for a period of 20 years. In the first of the Sabine Pass orders, DOE stated that it would evaluate the cumulative impact of the Sabine Pass authorization and any future authorizations for export authority when considering subsequent applications.

LNG Export Study

Following issuance of the Sabine Pass order, DOE undertook a two-part study of the cumulative economic impact of LNG exports. The first part of the study was conducted by the Energy Information Administration (EIA) and looked at the potential impact of additional natural gas exports on domestic energy consumption, produc-

tion, and prices under several prescribed export scenarios. The second part of the study, performed by NERA Economic Consulting under contract to DOE, evaluated the macroeconomic impact of LNG exports on the U.S. economy with an emphasis on the energy sector and natural gas in particular. The NERA study was made available on December 5, 2012.

On December 11, 2012, DOE published in the Federal Register a Notice of Availability of the EIA and NERA studies, and inserted both parts of the study into 15 then-pending LNG export application dockets for public comment. An initial round of comments on the study ended on January 24, 2013, and reply comments were due February 25, 2013.

Comments to the LNG Study

In response to the Notice of Availability, DOE received over 188,000 initial comments and approximnately 2,700 reply comments. Proponents of LNG exports generally endorsed the results of the two-part study, particularly the conclusion of the NERA study that increasing levels of exports will generate net economic benefits for the United States. On the other hand, comments filed by opponents of LNG exports raised a number of issues, including challenges to the assumptions and economic modeling underlying the two-part study and assertions that the two-part macroeconomic study should have further examined regional, sectoral, or environmental issues.

Use of Annual Energy Outlook Projections

On May 7, 2014, EIA issued its most recent projections for 2035 in the Annual Energy Outlook 2014 Reference Case (AEO 2014). Compared to AEO 2013 Reference Case, total natural gas consumption for 2035 is projected to increase by 4.7 Bcf/d, from 78.7 Bcf/d to 83.4 Bcf/d. However, total domestic dry gas production is projected to rise by 13 Bcf/d of natural gas, from 85.9 Bcf/d to 98.9 Bcf/d (although this increase includes Alaska natural gas production). Projections from the AEO 2014 reflect net LNG exports from the United States in a volume equivalent to 9.2 Bcf/d of natural gas. Of this projected volume, 7.4 Bcf/d are exports from the lower-48 states, 0.4 Bcf/d are imports to the lower-48 states, and 2.2 Bcf/d are exports from Alaska. This estimate compares with projected net LNG imports of 0.4 Bcf/d in the lower-48 for 2035 in the AEO 2011 Reference Case. The 2035 Henry Hub price in the AEO 2014 Early Release Reference Case is $6.92/MMBtu, down from $7.31/MMBtu in the AEO 2011 Reference Case (both in 2012 dollars).

In sum, comparing the AEO 2014 Reference Case and AEO 2013 Reference Case projections shows market conditions that continue to accommodate increased exports of natural gas. We also note that EIA's projection in the AEO 2014 Reference Case reflects domestic prices of natural gas that rise due to both increased domestic demand and exports, but that these price increases will be followed by "[a] sustained increase in production . leading to slower price growth over the rest of the projection period."

LNG Export Applications Status

Consistent with the NGA, as of June 12, 2014, DOE has approved 36 long-term applications to export lower-48 LNG to free trade agreement countries in an amount equivalent to 38.23 billion standard cubic feet per day of natural gas. In addition, DOE has four long-term applications pending to export lower-48 LNG to free trade agreement countries. No worldscale liquefaction facilities in the lower-48 currently exist, one facility is currently under construction, and 26 additional worldscale facilities are proposed to be built.

Most of the applicants seeking authorization to export LNG from proposed facilities to free trade agreement countries have also filed to export LNG to non-free trade agreement countries in the same volume from the same facility to provide optionality on the final destination country. The volumes of the applications to export to free trade agreement countries and non-free trade agreement countries are therefore not additive.

As of June 12, 2014, DOE has granted one final and six conditional long-term authorizations to export lower-48 LNG to non-free trade agreement countries in a total amount equivalent to 9.27 billion standard cubic feet per day of natural gas from six proposed liquefaction facilities. As of June 12, 2014, DOE had 26 applications pending to export LNG equivalent to an additional 26.68 billion standard cubic feet per day of natural gas to non-free trade agreement countries.

DOE Path Forward

Since receiving the first long-term application in 2010 to export LNG to non-FTA countries from the lower-48 states, the DOE has been—and remains—committed to conducting a public interest determination process as required by the Natural Gas

Act that is expeditious, judicious, and fair. Throughout this time, the Department has consistently made clear that a close monitoring of market developments plays a critical role in the Department's decision-making process.

On May 29, 2014, in order to reflect changing market dynamics, the Department of Energy proposed to review and make final public interest determinations on non-FTA export applications only after completion of the review required by environmental laws and regulations that are included in the National Environmental Policy Act (NEPA) review, thereby suspending its practice of issuing conditional authorizations. The proposed changes to the manner in which LNG applications are ordered and processed will ensure our process is efficient by prioritizing resources on the more commercially advanced projects, while also providing the Department with more complete information when applications are considered and public interest determinations are made.

In addition, the Department initiated an updated economic study and has released two environmental reports that address the environmental footprint of unconventional natural gas production and the lifecycle greenhouse gas impacts of U.S. LNG exports.

In keeping with the Department's commitment to an open and transparent process, the Department has made the proposed procedural change and environmental reports available for a 45 day public review and comment period.

Proposed Procedural Change

The Department's current practice is to issue conditional authorizations to export LNG to non-FTA countries before project sponsors and the FERC spend significant resources for the review of export facilities required by environmental laws and regulations that are included in the NEPA review. However, market participants have increasingly shown a willingness to dedicate the resources needed for their NEPA review prior to receiving conditional authorizations from the DOE. In response to these and other developments, the Department intends to make final public interest determinations only after a project has completed the NEPA review process, instead of issuing conditional authorizations. By removing the intermediate step of conditional decisions and setting the order of DOE decision-making based on readiness for final action, DOE will prioritize resources on the more commercially advanced projects.

The proposed procedural change will improve the quality of information on which DOE makes its public interest determinations. By considering for approval those projects that are more likely to actually be constructed, DOE will be able to base its decision on a more accurate evaluation of the project's impact on the public interest. DOE will also be better positioned to judge the cumulative market impacts of its authorizations in its public interest review. While it is not assured that all projects for which NEPA review is completed will be financed and constructed, projects that have completed the NEPA review are, generally speaking, more likely to proceed than those that have not.

In response to an evolving market, this proposed change will expedite the regulatory process for applicants, ensure that applications that have completed NEPA review will not be delayed by their position in the current order of precedence, and give the Department a more complete understanding of project impacts.

On June 4, 2014, the the Federal Register Notice was issued for the Notice of Proposed Procedures for LNG Export Decisions for a 45 day public review and comment period. During the review period, the Department will continue with evaluations of projects that have already received conditional authorizations and completed their NEPA review. Further, the Department will continue to act on requests for conditional authorization currently under review during the period in which the proposed changes are under consideration.

Economic Impact Study

DOE plans to undertake an economic study in order to gain a better understanding of how potential U.S. LNG exports between 12 and 20 billion cubic feet per day (Bcf/d) could affect the public interest. Using more recent data from sources like the Annual Energy Outlook 2014, the Energy Information Administration (EIA) will update its 2012 LNG Export Study, which principally looked at export cases of 6 and 12 Bcf/d. Following the EIA update, DOE will again contract for an external analysis of the economic impact of this increased range of LNG exports and other effects that LNG exports might have on the U.S. natural gas market. While these studies are underway, the Department will continue to act on applications as stated above. To date, the Department has issued final authorization for export to non-FTA countries at a rate of 2.2 Bcf/d. If at any future time the cumulative export authorizations approach the high end of export cases examined, the Department will con-

duct additional studies as needed to understand the impact of higher export ranges. At all levels, the cumulative impacts will remain a key criterion in assessing the public interest.

Both the updated EIA study and the planned external analysis of economic impacts will be made available for public comment.

Release of Environmental Reports

To better inform the Department and the public of the environmental impacts of increased LNG exports, the Department elected to prepare two additional reports of environmental issues beyond what is required for NEPA. The first report reviewed unconventional natural gas exploration and production activities and is titled Draft Addendum To Environmental Review Documents Concerning Exports Of Natural Gas From The United States. In keeping with the President's Climate Action Plan and the Administration's commitment to mitigate greenhouse gas emissions, the Department completed a second report called Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States.

On June 4, 2014, both environmental reports were made available for public comment for 45 days, after which the reports and comments received from the public will be considered by the Department in its public interest determinations in connection with applications to export LNG to non-FTA countries.

Conclusion

In conclusion Madam Chair, I would like to emphasize that DOE is committed to moving this process forward as expeditiously as possible. DOE understands the significance of this issue—as well as the importance of getting these decisions right.

The CHAIR. Thank you very much, Mr. Smith.

Mr. McNally.

STATEMENT OF ROBERT MCNALLY, PRESIDENT AND FOUNDER, THE RAPIDAN GROUP LLC

Mr. MCNALLY. Madame Chair, Ranking Member Murkowski, members of the committee, my name is Robert McNally. I'm the President and founder of Rapidan Group, an independent energy market policy and geopolitical consulting firm in Bethesda, Maryland. It's an honor to speak with you today about how to harness our energy bounty to serve our national economic and foreign policy interests.

The tremendous boom in U.S. oil and gas supply has been as unexpected as it has been fortuitous for our economy and national security. Ten years ago the United States imported two-thirds of its oil and was embarking on becoming a major importer of LNG. But thanks, largely, to the ingenuity, prowess and risk taking of American workers and investors, we have unlocked enormous new supplies of energy and completely reversed these trends.

Last year the United States emerged as the world's leading producer of petroleum energy, exceeding Saudi Arabia and Russia. EIA reported the U.S. natural gas production is up 40 percent since 2006. We hit an all time high in March of 72.7 billion cubic feet of production.Total gas reserves are up 46 percent since 2006.

The shale boom is a tremendous windfall for our struggling economy. It has boosted jobs faster than in any other industrial sector and facilitated a period of lower energy price volatility.

Our energy abundance also serves our foreign policy interests by turning our country into an arsenal of energy able to help friends and allies diversify from costly and dangerous dependence on countries like Russia and Iran. In the case of natural gas the striking swing of the U.S. from a future importer 10 years ago to a future exporter now has weakened Moscow's ability to impose high, nonmarket based prices on gas for Europe.

In Asia, just the prospect of U.S. LNG exports is already boosting Japan's bargaining position in its long term contracts with its LNG suppliers.

As many energy experts and officials have already noted, the changed energy landscape should cause policy makers to reconsider, reform or remove outmoded and restrictive regulations and policies instituted over 30 years ago amiss concerns about shortages and declining production. The Congress, the Administration and within it among leading think tanks, there is a strong support for LNG exports, particularly in the wake of Japan's nuclear crisis and more recently Russia's aggression toward Ukraine.

Bipartisan expert studies recommend the U.S. policy neither promote nor limit LNG exports. Second best LNG exports to all countries should be deemed in the public interest. Friends and allies should be able to compete on an equal footing with free trade partners. At the very least policymakers may wish to reduce the uncertainties and costs this current process creates.

In this vein I will turn to the recent changes in DOE's LNG export approval.

The old framework was problematic for reasons.

First, considering projects in the order they were filed disadvantaged projects that were down the queue but commercially more likely to be built. With 26 non-FTA applications currently in the queue and an average week interval between decisions many projects, many of the mature, faced a wait of up to 4 years.

Second, a soft cap of 12 billion cubic feet per day in total, conditional permit approvals caused concern that projects down the queue would never move forward.

DOE's new approach, announced on May 29th, contains several positive elements while creating new sets of questions and concerns.

The new process levels the playing field by changing the review sequence from order of filing to emergence in environmental permitting while also doing away with conditional permits and only issuing final ones.

Second, it more than tripled the head room for new project approvals under the 12 billion cubic foot per day soft cap by counting final instead of conditional approvals.

However, market participants still have concerns with the new process.

First, there is no certainty it will remain in force. It could be changed again.

Second, there appears to be no timeframe for DOE to decide when to grant a final permit once the environmental review has concluded, an issue that may be worked on here shortly as we heard.

Third, there are new risks that litigation could increase project delays and uncertainty. When it announced the new procedure, as my colleague just said, DOE released 2 draft environmental reports for public comments. While these DOE reports found no cause for environmental concern industry analysts and investors worry their inclusion may be used to delay in the courts.

In conclusion, while the impact of DOE's new LNG export approval process contains several positive elements concerns linger

and its overall impact remains to be seen. One thing is sure, there's more work to do. Given the large net benefits from—of our national energy boom for our economy, our labor market and our national security, policymakers should consider moving expeditiously to remove barriers to energy production infrastructure and trade.

Thank you for the opportunity to testify. I look forward to your questions.

[The prepared statement of Mr. McNally follows:]

PREPARED STATEMENT OF ROBERT MCNALLY, PRESIDENT AND FOUNDER, THE RAPIDAN GROUP LLC

Madam Chair and Members of the Committee, my name is Robert McNally and I am the president and founder of The Rapidan Group, an independent energy market, policy, and geopolitical consulting firm based in Bethesda, MD. It is an honor to speak with you today about how to harness our energy bounty to serve our national economic and foreign policy interests.

The tremendous boom in US oil and gas supply has been as unexpected as it has been fortuitous for our economy and national security. Ten years ago, the United States imported two-thirds of its oil and was on track to become a major importer of liquefied natural gas (LNG). But thanks largely to the ingenuity, prowess, and risk-taking of American workers and investors, we have unlocked an enormous new supply of domestic energy and completely reversed these trends.

Last year, the United States emerged as the world's leading producer of petroleum energy, exceeding Saudi Arabia and Russia. EIA reported US natural gas production is up 40 percent since 2006 and hit a record high of 72.7 bcf/d in March./1/1 Total proven wet gas reserves are up 46 percent over that same timeframe.

The US shale boom is a tremendous windfall for the struggling American economy. It has boosted jobs faster than any industrial sector and facilitated a period of lower energy price volatility. A recent White House report/2/2 noted "[r]ising domestic energy production has made a significant contribution to GDP growth and job creation. The increases in oil and natural gas production alone contributed more than 0.2 percentage points to real GDP growth in both 2012 and 2013, and employment in these sectors increased by 133,000 between 2010 and 2013." These employment estimates do not include indirect jobs created, which the White House noted, "could be quite large." The White House cited one private estimate that unconventional oil and gas activity contributed a total of 1.7 million direct and indirect jobs in 2012.

Arsenal of Energy

US energy abundance serves our foreign policy interests by turning our country into an "Arsenal of Energy" able to help friends and allies diversify from costly and dangerous energy dependence on countries like Russia and Iran. In the case of natural gas, the striking swing of the US from future importer ten years ago to future exporter now has weakened Moscow's ability to impose high, non-market based prices for natural gas in Europe. In Asia, the prospect of LNG exports is already boosting Japan's bargaining position with LNG suppliers in its long-term contracts.

Aboveground Risks

While future trends in the energy industry depend in considerable part on unforeseeable economic, technological, and geopolitical factors, political and regulatory uncertainty and costs are also substantial and ought to be much more manageable. As many energy experts and officials have noted, the changed energy landscape should cause policymakers to reconsider, reform, or remove outmoded, restrictive regulations and policies that were instituted over 30 years ago amidst concerns about shortages and declining US energy production. Whatever policy benefit those policies had is debatable, and now they have surely outlived any reasonable purpose.

One of the most important and ripe areas for updating is our policy on energy exports. The United States is the only country that requires companies to obtain a "public interest" permit to export natural gas. It is far from clear what public inter-

[1] http://www.eia.gov/forecasts/steo/report/natgas.cfm?src=Natural-b2

[2] http://www.whitehouse.gov/the-press-office/2014/05/29/white-house-releases-report-administration-s-all-above-energy-strategy-p

est would be harmed by allowing the market to determine how many LNG facilities should be built.

While some opponents claim allowing exports would significantly raise natural gas prices and hurt consumers and gas-intensive industries, most objective economic studies find that an increase in natural-gas prices caused by exports would be relatively small under any likely scenario. The net economic benefits of gas exports outweigh any harm, as the Department of Energy has reaffirmed in its recent LNG approval orders. While the aggregate amount of proposed LNG projects amounts to about one-half of US gas production, only a fraction of this amount will be financed and built.

Fortunately, a bipartisan consensus exists that the current procedural framework for approving natural gas exports should be updated. In Congress, the Administration, and within and among leading think tanks, there is strong support for LNG exports, particularly in the wake of Japan's nuclear crisis and, more recently, Russia's aggression toward Ukraine. DOE has so far approved six conditional permits and one final approval to export LNG to non-FTA countries.

Bipartisan expert studies recommend that Congress neither promote or limit LNG exports or ensure public interest determinations are granted automatically to our treaty allies./3/ A second-best option would be for policymakers to reduce the uncertainties and costs the current process creates. In that vein, I will turn to recent changes in DOE's LNG export approval procedure.

Old and New DOE Public Interest Process

The prior DOE procedure for reviewing applications for LNG exports to non-free trade agreement countries involved first granting a conditional public interest permit and then a final one after a project had cleared environmental permitting under the National Environmental Policy Act (NEPA) process at FERC (in the case of onshore facilities) or the Transportation Department's Maritime Administration (MARAD) for offshore jurisdictions. DOE considered applicants in an order of precedence based mainly on the date it applied to DOE and whether it had begun the NEPA process. DOE pledged to review applications expeditiously, and has been acting on permits with an average eight-week interval.

Additionally, under the prior policy framework, DOE had signaled and the market had largely accepted there would be a "soft cap" of 12 bcf/d of conditional approvals, after which an indefinite pause may take place./4/ Conditional approvals now total 9.27 bcf/d, implying only one to two more projects would be considered before the pause./5/

This old framework was problematic for two main reasons. First, the sequence DOE used to consider project applications disadvantages projects that are down the queue but commercially more likely to be built. With 26 non-FTA applications currently in the queue, that timeline left the review of many projects—in some cases commercially-mature ones already advanced in the NEPA process—more than four years in the future. Second, in short-changing projects that were more commercially and technically viable, investors were concerned these project would never move forward on permitting or experience lengthy delays with the soft cap of 12 bcf/d in place.

DOE's new approach, announced on May 29, contains several positive elements while creating new set of questions and concerns as well. The new process levels the playing field by changing the review sequence from order of filing to emergence from NEPA permitting, while also doing away with conditional permits and only issuing final ones. It recognizes FERC (and MARAD) is and ought to be the main "gatekeeper" for project approvals. Second, it more than tripled headroom under the "soft cap" by counting the final instead of conditional amounts of capacity approved, thus lowering the aggregate under the soft cap from 9.27 bcf/d to 2.2 bcf/d. Moreover, DOE announced it would study the economic impact of LNG exports of up to 20 bcf/d.

However, market participants still have concerns with the new process. First, there is no certainty this process will remain in force and it could be changed again. Second, there appears to be no timeframe for DOE to decide when to grant a final

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[3] http://www.brookings.edu/research/reports/2012/05/02-lng-exports-ebingerhttp://csis.org/event/us-japan-alliance-anchoring-stability-asia

[4] http://www.brookings.edu/research/articles/2014/06/10-doe-approving-lng-export-goldwyn-hendrix "While DOE never announced a cap of any kind, the fact that the NERA study focused on exports of to 12 bcf/d, and that each DOE order cited this number led analysts to assume that a new study would be required for exports in excess of 12 Bcf/d. DOE's announcement of updated studies to assess the impacts of exports between 12 and 20 Bcf/d appears to confirm this view." Footnote 1.

[5] Op. cit., footnote 2

permit once the environmental review has concluded. Third, there are new risks that in the new process obstructionist litigation could increase project delays and uncertainty. When it announced the new procedure, DOE also released two draft environmental reports/6/ for public comments. While these DOE reports found no cause for environmental concern, industry analysts and investors worry their inclusion may be used to delay projects in the courts.

Conclusion

While the impact of DOE's new LNG export approval process contains several positive elements, concerns remain, and its overall impact remains to be seen. Going forward, policymakers should act expeditiously to remove outdated, inefficient, and costly barriers to energy production, transportation, and trade in order of our country to realize the full economic and national security benefits of the shale oil and gas boom,

The CHAIR. Thank you very much.

Mr. Weiss.

STATEMENT OF DAN WEISS, SENIOR FELLOW AND THE DIRECTOR OF CLIMATE STRATEGY, CENTER FOR AMERICAN PROGRESS

Mr. WEISS. Chair Landrieu, Ranking Member Murkowski and members of the Senate Energy Committee, thank you for having me.

Growth in natural gas production has brought many domestic benefits including jobs, cheaper energy and cleaner energy. However, it's important to consider a number of factors when assessing whether to further speed up the approval of proposed gas export applications.

First, what is the impact on natural gas prices and electricity prices?

Second, what is the impact on domestic manufacturing and on wages?

Third, will this provide any assistance to Ukraine?

Fourth, how will this affect the climate?

So first, impact on prices.

The Energy Information Administration forecasts that even with a modest level of exports the price of natural gas for electricity would grow by nearly one-third by 2020. The Department of Energy NERA study referenced by the Chair, also found that exports would raise electricity prices.

Second, jobs and wages.

The U.S. Conference of Mayors found that recent lower natural gas prices have fueled nearly 200,000 new manufacturing jobs. A study by Dow estimates that consuming natural gas in the U.S. instead of exporting it would create 8 times more jobs than exports for aparticular given level of natural gas.

The DOE study that the chair referenced also determined that the expansion of LNG exports would provide net economic benefits but warned that, "Higher natural gas prices in 2015 can also be expected to have negative effects on output and employment." This study projected that total labor compensation would decline.

Third, fast tracking more LNG export approvals won't help Ukraine any time soon. Most LNG export applications to non-free

[6] http://energy.gov/fe/draft-addendum-environmental-review-documents-concerning-exports-natural-gas-united-states and http://energy.gov/fe/life-cycle-greenhouse-gas-perspective-exporting-liquefied-natural-gas-united-states

trade Nations are already contracted to countries in Asia including Japan, Korea and elsewhere. That's because the LNG price there is nearly 4 times higher than the U.S. price and about 60 percent higher than the price for LNG in Europe.

Additionally LNG exports to Ukraine require infrastructure that takes years to build. The first export facility may not be ready until 2016 and its gas is already contracted to go to India and South Korea.

The other approved LNG export projects won't be completed until 2017 or later. Again, nearly all the gas is contracted to go to Asian Nations.

A faster more effective assistance to Ukraine would be investments in energy efficiency, particularly since Ukraine is the second most energy wasteful Nation. The U.S. has already invested $15 million in Ukraine for efficiency projects that saved enough natural gas to power the equivalent of 200,000 American homes and worth nearly $200 million.

The Obama Administration plans that more efficiency assistance to Ukraine significantly expanding these efforts that reduce gas waste is an effective way to immediately help Ukraine reduce their reliance on Russian gas. It will provide assistance now, not 3 or 4 years from now.

No. 4, DOE must consider climate change when evaluating additional LNG exports.

The hundreds of scientists of the National Climate Assessment just issued yet another 10 alarm warning. It alerts that, "Climate change has moved firmly into the present. Human induced climate change continues to strengthen and that impacts are increasing across the country."

We must continue to reduce climate pollution. Yet the production of natural gas releases methane which is a very potent climate pollutant. The oil and gas sector is the second largest source of this methane due to fugitive releases during the production and leaks during distribution. The Energy Information Administration predicts that further natural gas exports would spur additional gas production which would lead to more methane pollution.

The Administration's future methane production program must limit fugitive methane from fracking and from natural gas transportation. That policy which hasn't been developed yet must take effect, in my view, before approving more exports.

The bottom line.

We've already approved 11 billion cubic feet per day of LNG exports. DOE reports that LNG exports would raise prices, lower wages and hurt manufacturing.

Eliminating public interest reviews of LNG export applications won't help Ukraine, but more energy efficiency investments now would.

More natural gas exports and production would worsen climate change until there are significant limits on methane emissions.

In our view it would be unwise to fast track anymore LNG export applications.

Thank you very much.

[The prepared statement of Mr. Weiss follows:]

PREPARED STATEMENT OF DANIEL J. WEISS, SENIOR FELLOW AND DIRECTOR OF CLIMATE STRATEGY, CENTER FOR AMERICAN PROGRESS

Chairman Landrieu, Ranking Member Murkowski, and members of the Committee on Energy and Natural Resources: thank you for the opportunity to testify on "How to harness a game-changing resource for export, domestic consumption, and transportation fuel." The question has taken on greater urgency due to last winter's increase in domestic natural gas consumption, the approval to export additional volumes of liquefied natural gas (or LNG), and Russia halting its natural gas exports to Ukraine.[1]

I plan to address several fundamental questions today.

- What criteria should the Department of Energy (or DOE) use to evaluate whether a proposed LNG export project is in the public interest?
- Are there cost-effective measures that the United States can undertake that would save natural gas, create jobs, and reduce pollution?
- Is elimination of the public interest test for proposed LNG export applications an effective policy to assist Ukraine or other nations threatened by potential high natural gas prices or supply reductions?

MEETING THE PUBLIC INTEREST STANDARD

In the past six years, the United States experienced a dramatic increase in natural gas production, primarily from "shale gas" generated from improvements in "hydraulic fracturing" (or "fracking") and horizontal drilling.[2] Unlike crude oil, there is no world market price for natural gas. Prices vary by nation or region, depending on factors including domestic supplies and transportation costs for exports. For instance, the Japan/Korea Marker (or JKM) natural gas price in May 2014 was $15.56 per million BTU of energy.[3] Meanwhile, the Henry Hub spot price for natural gas in the United States averaged $4.60 per million BTU of energy.[4] Exporting American shale gas to Japan or Korea would be quite profitable compared to selling it here.

The higher natural gas price overseas led companies to submit applications to build and operate LNG export facilities. Under the Natural Gas Act, the Federal Energy Regulatory Commission (or FERC) must approve proposed LNG export or import terminals. For projects that will export gas to one of the 18 nations that have a Free Trade Agreement with the United States, the projects are automatically deemed to be in "the public interest."[5] These 18 nations include Canada, Mexico, and the Republic of Korea.[6]

For potential gas importers that do not have a Free Trade Agreement with the United States—including Japan and Europe—DOE must determine whether the "proposed exportation or importation will not be consistent with the public interest," as required by Section 3(a) of the Natural Gas Act.[7] Earlier this year, Deputy Assistant Secretary of Energy Paula Gant explained to the House Subcommittee on Energy and Power that DOE/FE [Office of Fossil Energy] has identified a range of factors that it evaluates when reviewing an application for export authorization. These factors include economic impacts, international considerations, United States energy security, and environmental considerations, among others.[8]

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[1] Energy Information Administration, "In the News: Natural gas consumption sets winter record, with residential/commercial sectors surpassing 50 percent share," Natural Gas Weekly Update, April 3, 2014, available at http://www.eia.gov/naturalgas/weekly/#jm-trends.

[2] Energy Information Administration, "Technology drives natural gas production growth from shale gas formations," Today in Energy, July 12, 2011, available at http://www.eia.gov/todayinenergy/detail.cfm?id=2170.

[3] Platts, "Spot LNG Prices for June Delivery Fell 8.0 percent on Low Demand," Press release, May 19, 2014, available at http://www.platts.com/pressreleases/2014/051914/no.

[4] Energy Information Administration, "Henry Hub Natural Gas Sport Price," available at http://www.eia.gov/dnav/ng/hist/rngwhhdW.htm (last accessed June 2014).

[5] U.S. Department of Energy, "How to Obtain Authorization to Import and/or Export Natural Gas and LNG," available at http://energy.gov/fe/services/natural-gas-regulation/how-obtain-authorization-import-andor-export-natural-gas-and-lng#LNG (last accessed April 2014).

[6] Ibid.

[7] Energy Information Administration, Natural Gas Import/Export Regulation, (U.S. Department of Energy, 2011), available at http://www.usea.org/sites/default/files/event-file/511/Anderson DOE LNG Exports.pdf.

[8] Paula Gant, "The Department of Energy's Program Regulating Liquefied Natural Gas Export Applications," Testimony before the House Subcommittee on Energy and Power, March 25, 2014, available at http://docs.house.gov/meetings/IF/IF03/20140325/101953/HHRG-113-IF03-Wstate-GantP-20140325-U1.pdf.

Under these criteria, DOE has approved 7 LNG export applications. The Sabine Pass facility in Louisiana was the first to receive approval, and is under construction.[9] Its completion could occur in the fourth quarter of 2015.[10]

PUBLIC INTEREST DETERMINATION

On June 4, the DOE proposed to streamline the public interest determination process for applications to allow LNG export to non-free trade agreement nations by "acting only on applications for which NEPA [National Environmental Policy Act] review has been completed."[11] In DOE's view, this would enable the Department to better "judge the cumulative market impacts" in its public interest review.[12] It would also enable DOE to avoid spending scarce resources to review applications for proposed export terminals that may not receive approval by FERC.

Unfortunately, this proposed change in the public interest determination process does not ensure that the economic and climate effects become primary criterion for "evaluating the public interest" of LNG export applications. Instead, they remain secondary criteria.[13] An evaluation of the individual and cumulative impacts from approval of LNG export applications for non-free trade agreement nations should explicitly require an assessment of the increase of LNG exports on wages and electricity prices. It is essential that LNG exports do not significantly lower wages, raise rates, or harm manufacturing. In addition, DOE should evaluate the individual and cumulative impact of additional LNG exports on the emission of carbon, methane, and other climate pollutants.

Large LNG exports possible by 2020, leading to a natural gas price hike

The Energy Information Administration (or EIA) notes that LNG exports will increase by 14-fold between 2013 and 2020 under a "business as usual" scenario.[14] Before Congress passes legislation to accelerate or eliminate the public interest review process, it is essential to note that DOE has already approved seven LNG applications that could export 11 billion cubic feet per day (bcf/d) of natural gas—about 14 percent of total domestic production in 2020 under business as usual scenario.[15] [16]

Under a business as usual scenario—without significant expansion of LNG exports—EIA projects that the cost of natural gas for domestic electricity generation would rise by 32 percent between 2013 and 2020 and 60 percent between 2013 and 2030.[17]

A 2012 EIA study of various levels of LNG exports found that "increased natural gas exports lead to increased natural gas prices."[18] Prices could increase by up to 35 percent by 2018, depending on the supply of shale gas, and speed and amount of exports.[19] EIA also found that "on average, from 2015 to 2035, natural gas bills paid by end-use consumers in the residential, commercial, and industrial sectors combined increase 3 to 9 percent."[20] This would increase electricity bills for end-use customers by "1 to 3 percent."[21]

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[9] Edward McAllister and Ayesha Roscoe, "U.S. regulators approve Cheniere LNG export plant," Reuters, April 16, 2012, available at http://www.reuters.com/article/2012/04/16/us-cheniere-sabine-idUSBRE83F1AI20120416.

[10] Cheniere, "Sabine Liquefaction Project Schedule," available at http://www.cheniere.com/sabine liquefaction/project schedule.shtml (last accessed April 2014).

[11] "Proposed Procedures for Liquefied Natural Gas Export Decisions," Federal Register, daily ed., June 4, 2014, p. 32261, available at http://energy.gov/sites/prod/files/2014/06/f16/FE.ProposedProced.LNG .pdf.

[12] Ibid.

[13] John Anderson, "Exporting LNG: Permitting & Economic Analysis," (2011) available at http://www.usea.org/sites/default/files/event-file/511/Anderson DOE LNG Exports.pdf.

[14] Ibid.

[15] U.S. Department of Energy, "Applications Received by DOE/FE to Export Domestically Produced LNG from the Lower-48 States (as of June 11, 2014)," available at http://energy.gov/sites/prod/files/2014/06/f16/Summary percent20of percent20LNG percent20Export percent20Applications.pdf.

[16] Energy Information Administration, "Natural Gas Supply, Disposition, and Prices, Reference case," available at http://www.eia.gov/oiaf/aeo/tablebrowser/#release=AEO2013ER&subject=8-AEO2013ER&table=13-AEO2013ER&region=0-0&cases=early2013-d102312a (last accessed April 2014).

[17] Ibid.

[18] Energy Information Administration, Effect of Increased Natural Gas Exports on Domestic Energy Markets, (U.S. Department of Energy, 2012) available at http://www.eia.gov/analysis/requests/fe/pdf/fe lng.pdf.

[19] Ibid.

[20] Ibid

[21] Ibid.

The EIA study determined that "with additional gas exports, consumers will consume less and pay more on both their natural gas and electricity bill."[22] Total average annual electric bills could increase by up to $10 billion annually between 2015 and 2025.[23]

These EIA estimates assume an increase in natural gas exports of no more than 12 bcf/d. Since the analysis was completed in January 2012, U.S. natural gas exports via pipeline have grown by .5 bcf/d.[24] DOE has already approved export applications for a total of 11 bcf/d. There are pending LNG export applications for at least another 24 bcf/d of natural gas.[25] In other words, total natural gas exports could soon significantly exceed the 12 bcf/d that the EIA study assumed would be the upper limit in its analysis. Should natural gas exports expand beyond this amount, they could further increase gas and electricity prices beyond the EIA predictions.

The DOE study by the NERA consulting firm, "Macroeconomic Impacts of LNG Exports from the United States," reiterated EIA's prediction that natural gas and electricity prices would rise with exports. The NERA study determined that "U.S. natural gas prices increase when the U.S. exports LNG."[26] The analysis noted that "the electricity sector, energy-intensive sector, and natural gas dependent goods and services producers will all be impacted by price rises."[27] The analysis was also based on LNG exports of up to 12 billion cubic feet per day—a level that could be exceeded soon.

A significant natural gas price increase could have a severe impact on family budgets for those not employed in the gas industry. EIA reports that the typical household spent an average of nearly $2,000—or 2.7 percent of their household income—on household energy fuels in 2012.[28] Households in the fifth-lowest income bracket spent 6 percent—or twice that portion of their livelihood—on household fuels.[29]

While gas and electricity prices could rise, DOE projects that "total labor compensation" would decline.[30] Its study concluded that "households with income solely from wages or government transfers . . . might not participate in [the] benefits" of LNG export expansion.[31]

Higher natural gas prices could hurt manufacturing

Lower natural gas prices have fueled the recent increase in American manufacturing. Fuel Fix, a Hearst energy publication, reported in March that

> An ample supply of cheap natural gas has ignited a U.S. manufacturing surge projected to expand plant payrolls and drive demand for chemicals, machinery and steel through the end of the decade, according to a report released Thursday.
>
> Sinking natural gas prices.are linked to more than 196,000 new manufacturing jobs in major metropolitan areas and a $124 billion boost to sales for energy-intensive products like fabricated metals and plastics, according to a U.S. Conference of Mayors report on the nation's industrial growth.[32]

For instance, Canada's Methanex, the world's largest methanol producer, is spending $1.1 billion to move two of its Chilean factories to Geismar, Louisiana. The

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[22] Ibid.

[23] Ibid.

[24] Energy Information Administration, "U.S. Natural Gas Exports and Re-Exports by Country," available at http://www.eia.gov/dnav/ng/ng_move_expc_s1_a.htm (last accessed June 2014).

[25] U.S. Department of Energy, "Applications Received by DOE/FE to Export Domestically Produced LNG from the Lower-48 States."

[26] NERA Economic Consulting, "Macroeconomic Impacts of LNG Exports from the United States," prepared for the U.S. Department of Energy, (Washington: NERA, 2012) available at http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf.

[27] Ibid.

[28] Energy Information Administration, "Lower residential energy use reduces home energy expenditures as share of household income," Today in Energy, April 18, 2013, available at http://www.eia.gov/todayinenergy/detail.cfm?id=10891.

[29] Ibid.

[30] NERA Economic Consulting, "Macroeconomic Impacts of LNG Exports from the United States," prepared for the U.S. Department of Energy, (Washington: NERA, 2012) available at http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf.

[31] Ibid.

[32] Collin Eaton, "Report: Cheap gas will fuel US manufacturing job surge through 2020," Fuel Fix, March 20, 2014, available at http://fuelfix.com/blog/2014/03/20/cheap-gas-critical-to-u-s-manufacturing-surge-through-2020/.

plants are expected to open in 2015 and 2016.[33] Dow will spend $4 billion to build two new plants in Texas and reopen one in Louisiana.[34] These are simply several examples of the manufacturing revival linked to more shale gas production and lower gas prices.

This growth is at risk if more LNG exports boost natural gas prices, as the aforementioned studies indicate would occur. According to EIA, the industrial sector, which includes manufacturers that use natural gas as a feedstock, would experience a 28 percent price increase in direct natural gas costs between 2013 and 2020.[35] The price boost would be more than a 50 percent increase between 2013 and 2030.[36]

LNG exports could reduce net job creation compared to using this gas for domestic manufacturing. A study commissioned by the Dow Chemical Company—an opponent of unchecked LNG exports—found that a

> Comparison of the effects of the manufacturing sector using 5 Bcf/d of natural gas versus LNG terminals exporting 5 Bcf/d of natural gas.clearly shows higher . . . employment related to the manufacturing investments.
>
> This is primarily driven by the higher l.evel of investment required to manufacture products using the natural gas than to export it. Natural gas use of 5 Bcf/d in the manufacturing sector requires more than $90 billion in investments and significant annual spending, while LNG export terminals with 5 Bcf/d of capacity would involve only $20 billion in new investment.[37]

This study concluded that "the total direct and indirect employment for the manufacturing sector (180,000 annual jobs) is more than eight times the total direct and indirect employment from LNG exports (22,000 annual jobs)."[38]

The NERA study commissioned by DOE determined that the expansion of LNG exports would provide net economic benefit to the economy.

> 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.[39]

The study also concluded that higher natural gas prices from LNG exports would hurt manufacturing employment. It determined that

> Higher natural gas prices in 2015 can also be expected to have negative effects on output and employment, particularly in sectors that make intensive use of natural gas. The manufacturing sector [is] dependent on natural gas as a fuel and are therefore vulnerable to natural gas price increases. These particular sectors will be disproportionately impacted leading to lower output.[40]

An increase in LNG exports could increase climate pollution

It is irresponsible to discuss energy policies without consideration of the potential contributions to climate change. Recent scientific reports continue to sound even louder alarms about the threat to public health and our environment from unchecked carbon, methane, and other climate pollution. On March 30, the Intergovernmental Panel on Climate Change (or IPCC), the world's largest deliberative body of scientific study devoted to climate change, released its latest report "Impacts, Ad-

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[33] Jack Kaskey, "Chemical Companies Rush to the U.S. Thanks to Cheap Natural Gas," Bloomberg Businessweek, July 25, 2013, available at http://www.businessweek.com/articles/2013-07-25/chemical-companies-rush-to-the-u-dot-s-dot-thanks-to-cheap-natural-gas.

[34] Ibid.

[35] Energy Information Administration, "Natural Gas Supply, Disposition, and Prices, Reference case."

[36] Ibid.

[37] Ken Ditzel, Jeff Plewes, Bob Broxson, "US Manufacturing and LNG Exports: Economic Contributions to the US Economy and Impacts on US Natural Gas Prices," prepared for The Dow Chemical Company, (Washington: Charles River Associates, 2013), available at http://www.crai.com/uploadedFiles/Publications/CRA_LNG_Study_Feb2013.pdf.

[38] Ibid.

[39] NERA Economic Consulting, "Macroeconomic Impacts of LNG Exports from the United States," prepared for the U.S. Department of Energy, (Washington: NERA, 2012) available at http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf.

[40] Ibid.

aptation, and Vulnerability."[41] In its strongest language to date, the report warns that "Impacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability."[42]

The New York Times noted the report warns that

> "Throughout the 21st century, climate-change impacts are projected to slow down economic growth, make poverty reduction more difficult, further erode food security, and prolong existing and create new poverty traps, the latter particularly in urban areas and emerging hot spots of hunger," the report declared.[43]

The United States' National Climate Assessment, released on May 6, reiterated the IPCC findings. The assessment includes the dire warning that

> Climate change, once considered an issue for a distant future, has moved firmly into the present . . . This National Climate Assessment concludes that the evidence of human-induced climate change continues to strengthen and that impacts are increasing across the country.
>
> Americans are noticing changes all around them. Summers are longer and hotter, and extended periods of unusual heat last longer than any living American has ever experienced. Winters are generally shorter and warmer. Rain comes in heavier downpours. People are seeing changes in the length and severity of seasonal allergies . . .
>
> Other changes are even more dramatic. Residents of some coastal cities see their streets flood more regularly during storms and high tides. Inland cities near large rivers also experience more flooding, especially in the Midwest and Northeast. Insurance rates are rising in some vulnerable locations, and insurance is no longer available in others. Hotter and drier weather and earlier snow melt mean that wildfires in the West start earlier in the spring, last later into the fall, and burn more acreage.[44]

In the United States, climate related events exact a huge human and economic toll. Examples of these costs include scorching California drought, record floods in Colorado, and a deadly wildfire season just ahead. Nationwide, in the past three years, there were 34 extreme weather events that each caused $1 billion or more in damages.[45] Together, these events took 1,221 lives and caused $208 billion in damages.[46]

So we must assess the potential impact of LNG exports on U.S. climate pollution. It's well documented that fracking to produce shale gas generates fugitive methane, which is the main component of natural gas.[47] Methane is a potent climate pollutant, which has 86 times more warming potential than carbon dioxide pollution over a 20-year time period.[48] This means that significant additional emissions in the near future could spur much more climate change, extreme weather, and other harmful impacts.[49]

Oil and gas production is the second largest source of domestic methane pollution, responsible for nearly 30 percent of it.[50] The administration's "Climate Action Plan Strategy to Reduce Methane Emissions" noted that "methane equivalent to 127 million tons of carbon dioxide pollution was emitted from production, processing, transmission, storage, and distribution of natural gas" in 2012.[51]

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[41] Intergovernmental Panel on Climate Change, "Fifth Assessment Report (AR5)", available at http://www.ipcc.ch/index.htm#.U0QQ7GbD-70 (last accessed April 2014).

[42] Intergovernmental Panel on Climate Change, "IPCC WGII AR5 Summary for Policymakers," (IPCC Secretariat: Geneva, 2014) available at http://ipcc-wg2.gov/AR5/images/uploads/IPCC—WG2AR5—SPM—Approved.pdf.

[43] Justin Gillis, "Panel's Warning on Climate Risk: Worst Is Yet to Come," New York Times, March 31, 2014, available at http://www.nytimes.com/2014/04/01/science/earth/climate.html.

[44] U.S. Global Change Research Program, "National Climate Assessment Overview," available at http://nca2014.globalchange.gov/downloads.

[45] Daniel J. Weiss and Siri Manning, "2013: Extreme Weather, Extreme Damage" Center for American Progress, March 27, 2014, available at http://www.americanprogress.org/issues/green/news/2014/03/27/86532/2013-extreme-weather-extreme-damage/.

[46] Ibid.

[47] The White House, "Climate Action Plan: Strategy to Reduce Methane Emissions," (2014), available at http://www.whitehouse.gov/sites/default/files/strategy to reduce methane emissions 2014-03-28 final.pdf.

[48] Ibid.

[49] Ibid.

[50] Ibid.

[51] Ibid.

If LNG exports drive an increase in natural gas production—as many predict—this could also spark growth in methane pollution unless strict limits are set to reduce it during the production and transportation phases. This concern led the EPA to urge FERC "to consider greenhouse gas impacts from increased U.S. natural gas drilling in its environmental review of a natural gas export terminal in Louisiana." [52]

The U.S. must significantly reduce its methane releases to meet its 2020 climate pollution reduction goal. Later this year, the EPA will release its methane reduction ideas for the oil and gas sector, which should include cost-effective limits on this pollutant.[53]This reduction regime must be promptly implemented in oil and gas fields to avoid further exacerbating climate change.

Ignoring the potential increase in methane pollution from additional gas production driven by LNG exports won't make climate change go away—it will only make its impacts more deadly, destructive, and expensive.

DOE, too, must also assess the potential increase in methane pollution when reviewing pending LNG export applications. This evaluation should factor in the cumulative increase in natural gas production from all of the LNG export applications already approved, as well as the impact of the growth in gas production due to additional exports.

Some proponents of additional LNG exports argue that they would benefit the climate by replacing dirty coal-fueled electricity produced in Asia and Europe. Natural gas combustion for electricity emits only half of the carbon pollution compared to coal combustion. However, the National Energy Technical Laboratory's (or NETL) just released "Life Cycle GHG Perspective on Exporting LNG from the U.S." found that there are 50 percent more emissions from the natural gas export supply chain compared to coal's supply chain, offsetting the gains due to lower pollution from combustion.[54] Thus, the NETL analysis concluded that there was little difference in the total amount of life cycle climate pollution between "U.S. LNG exports for power production in European and Asian markets. when compared to regional coal extraction and consumption for power production."[55]

Exporting LNG would convert a relatively clean fuel to one with similar emissions levels to coal. At a time when we must sharply reduce climate pollution, we can little afford such a result. LNG export proponents cannot claim that more exports will lower overseas climate pollution because NETL debunked this notion.

Save natural gas, create jobs, cut pollution

One way to lower consumer prices and cut climate pollution is to make our natural gas distribution system much more efficient. A report by Sen. Ed Markey, "America Pays for Gas Leaks," estimated that the aging network of natural gas pipelines leak significant amounts of this fuel. It determined that

> Gas distribution companies in 2011 reported releasing 69 billion cubic feet of natural gas to the atmosphere, almost enough to meet the state of Maine's gas needs for a year and equal to the annual carbon dioxide emissions of about six million automobiles.
>
> Gas companies have little incentive to replace these leaky pipes, which span about 91,000 miles across 46 states because they are able to pass along the cost of lost gas to consumers. Nationally, consumers paid at least $20 billion from 2000-2011 for gas that was unaccounted for and never used according to analysis performed for this report.[56]

Sen. Markey introduced legislation that would begin to plug these leaks. "The Pipeline Modernization and Consumer Protection Act," S. 1767, would "require gas pipeline facilities to accelerate the repair, rehabilitation, and replacement of high-

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[52] Jim Day, "EPA raises greenhouse issue in FERC reviews of LNG export terminals," IHS The Energy Daily, April 4, 2014, available at http://www.theenergydaily.com/publications/ed/10905.html.

[53] Ibid.

[54] National Energy Technology Laboratory, Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States, (U.S. Department of Energy, 2014), available at http://www.netl.doe.gov/File percent20Library/Research/Energy percent20Analysis/Life percent20Cycle percent20Analysis/NETL-LNG-LCA-29May2014.pdf.

[55] Ibid.

[56] Sen. Edward Markey, "America Pays for Gas Leaks," Report prepared for Sen. Edward Markey, August 1, 2013, available at http://www.markey.senate.gov/documents/markey lost gas report.pdf.

risk pipelines."[57] Companies would develop a priority list of their pipelines that pose the most risk, and adopt a cost-recovery program to pay to repair them.[58]

Sen. Markey also introduced a bill to help stem natural gas leaks from pipelines while creating jobs. The "Pipeline Revolving Fund and Job Creation Act," S. 1768, would provide "grants to states to establish [revolving] loan funds," with each state providing 20 percent of the money in their fund.[59] It would last for ten years.

Together, these bills would begin to plug natural gas pipeline leaks, create jobs for workers to repair them, save consumers money due to less wasted gas, and cut climate pollution. Most importantly, they would identify and repair the most hazardous pipelines to reduce the likelihood of another tragic gas explosion, such as the one in Harlem in March.

Companion bills were introduced in the House of Representatives by Rep. Charles Rangel (D-NY). These bills have broad support from organizations including the United Steelworkers, Consumers Union, New England Gas Workers Association, United Association of Plumbers and Pipefitters, and other interests.

USAID PROGRAM ACHIEVED COST-EFFECTIVE EFFICIENCY IN UKRAINE

The United States Agency for International Development (USAID) has already invested a small amount of funds to reduce Ukraine's woeful energy waste. It launched the "Municipal Heating Reform Project," (or MHR) in 2009, which "selected 38 cities. . . for the implementation of project activities and energy efficiency demonstration projects."[60] There were efforts in these cities to conduct

> Municipal energy assessments, development of municipal energy plans, development of legal and technical specifications for metering equipment, implementation of energy efficient technologies, and monitoring results.[61]

By 2013, the project achieved substantial results. For instance, through 2012 "on average, the implementation of heat metering and control systems resulted in 18.7 percent savings," according to an Alliance to Save Energy draft report.[62]

Engility, a USAID contractor on the MHR project, noted that it leveraged USAID's investment to achieve the following significant energy, financial, and pollution savings, including:

- 380 million cubic meters of natural gas saved;
- $225 million leveraged for energy efficiency projects;
- 676,000 tons CO2 emissions reduction;
- 25 Municipal Energy Plans with appropriate local budget support;
- 5 Regional Training Centers established;
- 34 energy efficiency/improved heating demonstration projects; and,
- 3,160 people (including 1,760 women) directly trained in energy efficiency subjects.[63]

The MHR project was relatively inexpensive. The first three years cost a total of $15 million.[64] It received another $13.5 million in September 2013.[65]

EFFICIENCY CAN PROMPTLY HELP UKRAINE REDUCE DEPENDENCE ON RUSSIAN GAS

Russia recently increased its threat to Ukraine by cutting off its natural gas supplies. Russia hopes to exploit Ukrainian dependence on its gas to dominate this

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[57] Pipeline Modernization and Consumer Protection Act, S. 1767, 113th Cong., 1s sess. (November 21, 2013), available at http://beta.congress.gov/bill/113th-congress/senate-bill/1767?q={ percent22search percent22 percent3A[percent22Markey percent22]}.

[58] Ibid.

[59] Pipeline Revolving Fund and Job Creation Act, S. 1768, 113th Cong., 1s sess. (November 21, 2013), available at http://beta.congress.gov/bill/113th-congress/senate-bill/1768?q={ percent22search percent22 percent3A[percent22Markey percent22]}/.

[60] "USAID Marks Four Years of Success in Improving Municipal Energy Efficiency in Ukraine," (2014), available at http://ukraine.usembassy.gov/events/usaid-heating-project.html.

[61] Ibid.

[62] Alliance to Save Energy and the International Resource Group, "Ukraine Municipal Heat Reform Project, Energy Monitoring Report For Heating Season 2010-2011: Implementation Of Heat Metering And Weather-Based Control Systems (Draft)," prepared for USAID (2011).

[63] Engility, "Municipal Energy Reform Project (MERP)—Ukraine," available at http://www.engilitycorp.com/files/8613/8669/8425/ENERGY - MERP Rev.pdf.

[64] A. Delgado and M. Evans, "Inventory of U.S.-led International Activities on Building Energy Efficiency," prepared for U.S. Department of Energy, (Richland, WA: Pacific Northwest National Laboratory, 2010) available at http://www.pnl.gov/main/publications/external/technical_reports/pnnl-19467.pdf.

[65] Engility, "Municipal Energy Reform Project (MERP)—Ukraine."

independent nation. In 2012, Ukraine produced only 37 percent of its own gas, and imported the remainder from Russia.[66]

The Obama administration recently delivered some cost effective aid to Ukraine that would reduce its reliance on Russian gas. During Vice President Joe Biden's visit to Ukraine in April, he promised assistance to "maximize energy efficiency, which could deliver potentially huge cost savings to Ukraine and rationalize energy consumption."[67]

Sen. Markey introduced legislation to build on this aid, the "Ukrainian Independence from Russian Energy Act," S. 2433.[68] He noted that this bill responds to

> A coalition of 35 Ukrainian mayors . . . urgently requesting assistance in increasing the energy efficiency of their buildings, district heating systems, and transportation networks in order to reduce dependence on imports of natural gas from Russia.
>
> Ukraine is currently the second most wasteful country in the world with energy. If the country were only as energy efficient as the average country in Europe, that level of efficiency would almost completely eliminate Ukraine's need to import Russian natural gas.[69]

S. 2433 would provide $30 million over three years to assist Ukraine with efficiency measures, including replacing inefficient boilers, upgrading district heating systems, plugging leaky pipes, and improving the efficiency of buildings.[70]

EFFICIENCY IS FASTER AND CHEAPER THAN LNG EXPORTS TO AID UKRAINE

Legislators are understandably concerned about Russia using natural gas as a weapon against Ukraine. The Washington Post reported that

> Many members of Congress are pressing the Obama administration to use energy as a diplomatic weapon and to speed permits for natural gas export terminals to ease Europe's and Ukraine's heavy reliance on Russian supplies.[71]

There is legislation to fast track approval of additional LNG export applications by eliminating or truncating DOE's public interest review of proposed exports.[72]

Additional approval of LNG exports threatens to further hike natural gas prices and pollution, but would do little to help Ukraine. The Sabine Pass LNG facility is the export terminal nearest to completion, and its finish date is at least a year and a half away.[73] The New York Times notes that "half of the gas that will leave [the] facility has already been contracted by India and South Korea. The other half will go to British and Spanish companies."[74]

None of the other approved LNG terminals have even begun construction. The Washington Post predicts that LNG exports to Ukraine could not occur until "years from now. The earliest gas exports won't come until late 2015 or 2016, and most won't get started until 2017 through 2019."[75]

Oil executives understand that the approval, construction and operation of LNG export terminals is a lengthy process. The New York Times reported that

> "L.N.G. exports are not about snapping your fingers and making them happen," said Marvin E. Odum, president of the Shell Oil Company, which

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[66] Energy Information Administration, "Ukraine," available at http://www.eia.gov/countries/country-data.cfm?fips=UP (last accessed April 2014).

[67] The White House, "FACT SHEET: U.S. Crisis Support Package for Ukraine," Press release, April 21, 2014, available at http://www.whitehouse.gov/the-press-office/2014/04/21/fact-sheet-us-crisis-support-package-ukraine.

[68] Sen. Ed Markey, "Markey Introduces Legislation to Boost Ukrainian Energy Independence, Lessening Putin's Power," Press release, June 5, 2014, available at http://www.markey.senate.gov/news/press-releases/markey-introduces-legislation-to-boost-ukrainian-energy-independence-lessening-putins-power.

[69] Ibid.

[70] Ibid.

[71] Steven Mufson, "Can U.S. natural gas rescue Ukraine from Russia?" Washington Post, March 25, 2014, available at http://www.washingtonpost.com/blogs/wonkblog/wp/2014/03/25/can-u-s-natural-gas-rescue-ukraine-from-russia/.

[72] Ayesha Rascoe, "U.S. lawmakers mull speedier gas exports to help Ukraine, Europe," Reuters, March 25, 2014, available at http://www.reuters.com/article/2014/03/25/us-usa-lng-congress-idUSBREA2O08Z20140325.

[73] Cheniere, "Sabine Liquefaction Project Schedule."

[74] Clifford Krauss, "U.S. Gas Tantalizes Europe, but It's Not a Quick Fix," New York Times, April 7, 2014, available at http://www.nytimes.com/2014/04/08/business/energy-environment/us-gas-tantalizes-europe-but-its-not-a-quick-fix.html?—r=0.

[75] Steven Mufson, "Can U.S. natural gas rescue Ukraine from Russia?"

> has partnered with Kinder Morgan in a proposed export terminal in Georgia that is awaiting regulatory approval. "These are large business development projects that take several years of construction and several years of business development and engineering design."[76]

The Times concluded that "the United States can offer little hope for Europeans eager to diversify their gas sources as Russia occupies Crimea and may threaten other parts of eastern Ukraine."[77]

The bottom line: rushing to approve more LNG exports will not provide immediate or prompt relief for embattled Ukraine, but there are other significant ways we can help them.

Rather than eliminate the public interest review of proposed LNG export facilities, the United States should expand the administration's energy efficiency assistance to Ukraine by passage of S. 2433 to help slash its energy waste. Some of these efficiency measures could include replacement of inefficient furnaces and compressors with highly efficient American made models. This would reduce Ukrainian purchases of Russian gas, and create jobs both in Ukraine and the United States.

On Monday, June 16, new uncertainty was injected into the fate of LNG exports when it was revealed that the federal government may have ignored the law by approving export applications. Based on an investigation by Sen. Markey, the Houston Chronicle reported that

> A decades-old decision by the Commerce Department to abandon congressionally mandated restrictions on natural gas exports could jeopardize current plans to sell the fossil fuel overseas.
>
> Although Congress passed a law in 1975 directing the government to bar exports of U.S. oil and natural gas, the Commerce Department never got further than crude. And when Commerce formally delegated gas export issues to the then one-year-old Energy Department in 1978, it did so citing a much older 1938 law and the regulations born under it—without any mention of the newer 1975 mandate.[78]

This four decade disregard of the Energy Policy and Conservation Act of 1975 could halt approval of additional export applications, and provides a potent legal argument to those challenging the applications already approved by DOE.[79] The Department of Commerce has yet to respond to Sen. Markey's findings.[80]

CONCLUSION

The huge increase in domestic shale gas production provides many benefits to the United States, including a home grown, cleaner, cheaper fuel for electricity generation, and more jobs in the oil and gas industry. It has also sparked a domestic manufacturing renaissance. We must ensure that there are strict enforceable limits on the emission of methane and other air and water pollution produced from the production, transmission and combustion of natural gas.

Likewise, the approval of additional LNG export applications should occur only if they do not cause electricity price spikes that would harm middle- and low-income families and business budgets, lower wages, or impair the recent manufacturing resurgence. Additionally, such exports must help reduce—rather than increase—climate pollution. The cheapest, fastest, most economically beneficial step to meet energy needs in the United States or Ukraine is to launch mass energy efficiency programs to plug leaky pipes, reduce building energy use, and reduce other sources of energy waste. This would provide much quicker assistance to Ukraine than eliminating public interest reviews for future LNG export proposals.

The CHAIR. Thank you.

Mr. Durbin.

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[76] Clifford Krauss, "U.S. Gas Tantalizes Europe, but It's Not a Quick Fix."

[77] Ibid.

[78] Jennifer A. Dlouhy, "Sen. Markey: Regulatory oversight jeopardizes gas export approvals," Fuel Fix, June 16, 2014, available at http://fuelfix.com/laredo/2014/06/16/sen-markey-regulatory-oversight-jeopardizes-gas-export-approvals/.

[79] Sen. Ed Markey, "Markey: Natural Gas Export Approvals May Be Unlawful," Press release, June 16, 2014, available at http://www.markey.senate.gov/news/press-releases/markey-natural-gas-export-approvals-may-be-unlawful.

[80] Jennifer A. Dlouhy, "Sen. Markey: Regulatory oversight jeopardizes gas export approvals."

STATEMENT OF MARTY J. DURBIN, PRESIDENT AND CEO, AMERICA'S NATURAL GAS ALLIANCE

Mr. DURBIN. Thank you. Good afternoon, madame chair, Ranking Member Murkowski, members of the committee.

The question presented by today's hearing appropriately acknowledges the tremendous opportunity we have as a Nation. The enormous technological innovations which continue to advance at a stunning pace are driving economic growth, environmental improvements and enhanced energy security. Recently the former Federal Reserve Chairman, Ben Bernanke, commented that growth in domestic energy production is one of the bright spots in our economic recovery.

In addition, increased use of natural gas in both power generation and transportation is greatly reducing emissions not only of carbon dioxide, but also criteria pollutants such as sulfur dioxide, nitrogen oxides, mercury and particulate matter. Of course, to fully harness the benefits of natural gas the Federal Government must support the continued, safe and responsible development of this resource and maintain the fiscal policies that have drivenin the innovation and allow for cost recovery in what is a very capital intensive activity. But just as importantly we must work together to assure the necessary policies, infrastructure and market rules are in place that will allow for the efficient utilization of natural gas across the economy from power generation and manufacturing to transportation and exports.

It's important to highlight the scope of our abundant, affordable supply of natural gas in this country. Simply put the U.S. has enough natural gas at affordable prices to sustain substantial increases in domestic consumption and to support exports.

To provide some context the volume of natural gas consumed in 2013 in the U.S. was 26 trillion cubic feet. Compare that to recent projections that show a range of technically recoverable gas using today's technology from 2,200 to 3,500 trillion cubic feet. There's your one hundred plus year supply. As technology continues to advance in unconventional drilling these reserve estimates will continue to grow.

Exporting natural gas gives you, as policymakers, a chance to create new jobs here at home, reduce the trade deficit and grow GDP. Production spurred by exports will also increase the production of natural gas liquids benefiting our petrochemical industry that is already seeing a resurgence of new and expanded facilities. LNG exports can help support all of this at home while helping U.S. allies around the world, but time is of the essence.

Globally natural gas demand is not infinite and other countries are already seizing this opportunity. Those facilities that are able to come online sooner from whatever country will have a competitive advantage in serving the expected global LNG demand.

There are also exciting opportunities for increased use of natural gas in the transportation sector. Natural gas use in heavy duty transportation including truck, rail and marine applications is driven by the performance and cost saving benefits that natural gas offers. Compliance with regulatory requirements to reduce pollutants are also driving investments in natural gas as a transportation

fuel. Of course, using this domestic fuel continues to enhance U.S. energy security.

The transportation industry is seeing the benefits of LNG as a fuel. For example, Harvey Gulf International Marine has commissioned the construction of 6 LNG powered, offshore supply vessels and expects to save a dollar per gallon in fuel costs.

In the on road space we've seen significant growth in the number of both CNG and LNG fueling stations.

While this growth in the on road and off road markets is encouraging, it's also important to highlight policy changes that could have a positive impact in the transportation sector. For example, the natural gas vehicle industry is supporting the formal adoption of a diesel gallon equivalent as the measurement to be used for both CNG and LNG. So consumers can make simple and accurate cost comparisons.

Madame Chair, the shale energy revolution has allowed us to transition from a posture of energy scarcity to one of energy abundance in just a few short years. As this hearing demonstrates we have the ability to harness clean, abundant and affordable natural gas for both domestic consumption and for exports. This paradigm shift is driving economic growth, environmental improvements and enhanced energy security.

ANGA will continue to engage policymakers in helping to find solutions to our Nation's energy challenges. I'm grateful to the Chair, the ranking member and members of the committee. I look forward to our continued work together.

Thank you.

[The prepared statement of Mr. Durbin follows:]

PREPARED STATEMENT OF MARTIN J. DURBIN, PRESIDENT AND CEO, AMERICA'S NATURAL GAS ALLIANCE

Introduction

Good afternoon, Madam Chair, Ranking Member Murkowski and Members of the Committee. Thank you for the opportunity to testify today. My name is Marty Durbin. I am President and Chief Executive Officer of America's Natural Gas Alliance ("ANGA").

ANGA represents North America's leading independent natural gas exploration and production companies. We work with industry, government and customer stakeholders to increase demand for, and ensure availability of, our nation's natural gas resources for a cleaner and more secure energy future. The collective natural gas production of ANGA member companies is approximately eight trillion cubic feet annually, which represents one third of total U.S. production.

Today's hearing asks how we can harness this game-changing resource, which appropriately acknowledges the opportunity we have before us as a nation. The enormous technology innovations, which continue to advance at a stunning pace, are driving economic growth, environmental improvement and enhanced energy security.

Recently, former Federal Reserve Chairman Ben Bernanke commented that growth in domestic energy production is one of the "bright spots" in our economic recovery, responsible for significant job creation and investment here at home. In addition, increased use of natural gas in both power generation and transportation is greatly reducing emissions not only of carbon, but also of criteria pollutants such as sulfur dioxide (SO_2), nitrogen oxides (NOx), mercury and particulate matter (PM). And the opportunity to export natural gas provides economic and national security benefits.

To fully harness the benefits of natural gas, ANGA believes the federal government must, of course, allow for the continued safe and responsible development of this resource, and maintain fiscal policies that have driven innovation and allow for cost recovery in what is a capital-intensive activity. Just as importantly, we must all work together to ensure the necessary infrastructure, policies and market rules

are in place that allow for the efficient use of natural gas across the economy manufacturing, transportation and exports.

Today, however, I will focus my testimony on the exports of LNG and the tremendous opportunities we have for e use of natural gas in the transportation and manufacturing sectors. But, first I want to highlight the abundant driving these opportunities.

Natural Gas Supply

The Energy Information Administration (EIA), the Potential Gas Committee, and MIT all project ample domestic supplies of natural gas to power our nation for generations. The U.S has enough natural gas at reasonable prices to sustain substantial increases in domestic consumption and to support exports. To put these findings in context, the volume of natural gas consumed in 2013 in the U.S. was 26 trillion cubic feet. The most recent projections show a range of technically recoverable gas using today's technology from 2,203 to 3,545 trillion cubic feet (Figure 1*). As technology continues to advance in unconventional drilling, reserve estimates will also continue to grow.

Importantly, using today's technology, ICF International estimates more than 1,500 TCF of dry gas is recoverable at $5 per MMBTU or less in the United States and Canada[1] (Figure 2).

Source: ICF[2]

Technology advancements have allowed us to access natural gas reserves that were previously too expensive to extract. Since the beginning of 2005, natural gas production in the United States has increased 30 percent. EIA's most recent projections, the 2014 Annual Energy Outlook[3] (AEO2014) show a 56 percent increase in total natural gas production from 2012 to 2040. Figure 3 shows that the most recent projection is 47 percent higher than the projection made in 2009 and 10 percent higher than just last year. The only uncertainty appears to be how high it will go.

Price projections show an inverse relationship to production estimates (see Figure 4). In 2009, 2035, but their most recent outlook (AEO2014) projects prices near $6 per MMBTU. EIA's projections are comparable Mackenzie (WoodMac), and CERA.

Price increases during last winter's by infrastructure constraints and not a lack of supply. Cold weather drove a short-term increase in prices at Henry Hub by a couple of dollars per MMBTU but prices reverted quickly back to their long-term outlook range as weather improved. More importantly, the prompt year forward markets remained relatively un-phased by price movements seen in the spot market. The annual 2015 strip remained less than $4.50 per MMBTU[4]. And even on the one day when spot prices went to $120 per MMBTU in New York, the price in Western Pennsylvania was $4.30 per MMBTU.[5] This further emphasizes the robust supply underlying all natural gas market fundamentals.

This abundant, affordable supply can support significant demand growth across all sectors of the economy including power generation, manufacturing, transportation and exports. The relevant question is not how much prices will increase due to this growth in demand, but rather how much demand will grow to take advantage of this abundant, affordable resource.

LNG Exports & the Manufacturing Renaissance

Incremental demand from LNG exports is projected to result in small price impacts. The NERA Economic Consulting study commissioned by the Department of Energy finds that as the level of LNG exports increase from the U.S., so too does the level of economic benefits to the U.S.[6]

Additionally, robust natural gas production has also resulted in dramatic increases in U.S. natural gas liquids (NGL) production. This impressive increase in NGL supply, the primary feedstock for chemicals and plastics manufacturing, is driving an unprecedented resurgence in our nation's petrochemical industry. Cal Dooley, President and CEO of the American Chemistry Council, stated in March that "U.S. chemical manufacturers surpassed the $100 billion mark in anticipated investments related to shale gas . . . nearly 150 investment projects—ranging from restarts, to expansions, to brand new facilities—will create an estimated $81 billion

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* All figures have been retained in committee file.

[1] ICF International, "U.S. LNG Exports: Impacts on Energy Markets and the Economy." May, 2013. pg. 44-45.

[2] Ibid.

[3] EIA, "Annual Energy Outlook 2014." May, 2014.

[4] NYMEX Futures, Henry Hub 2015 Annual Strip. Trade dates: Jan 1, 2014—Jun 13, 2014.

[5] Intercontinental Exchange, TGP-Z4 Marcellus Spot. Trade date: Jan 21, 2014.

[6] NERA Economic Consulting, "Macroeconomic Impacts of LNG Exports from the United States." December 2012, pg 1.

per year in new chemical industry output, and 637,000 permanent new jobs in communities across the United States."[7]

Dry natural gas and NGLs are co-products, and in most cases, one is not produced without the other. An increase in dry gas production will result in an increase in NGL production. A demand outlet for dry gas (like LNG exports) encourages continued investment in overall production, which in turn leads to a robust supply of NGLs and vice versa. ICF examined the impacts of LNG exports and found that natural gas liquid volumes would increase between 138,000 and 555,000 barrels per day (bpd) by 2035 due to LNG exports.[8] An increase in NGL supply helps to preserve low NGL prices and this benefits domestic manufacturing industries.

With respect to LNG exports, time is of the essence. Global demand for natural gas is expected to increase between 18 bcf/d and 38 bcf/d by 2025. Proposed new global LNG capacity outside the U.S. is approximately 50 bcf/d. Given the disparity between projected demand, and the number of facilities being proposed worldwide, the window of opportunity for the U.S. to get involved is narrow. The facilities that come online the fastest will have a competitive advantage in serving the expected global LNG demand.

For every incremental billion cubic feet of gas produced each day to support LNG exports, 13,000 upstream jobs, 1,700 construction jobs and 200 operations jobs are created.[9]

Recent instability in Ukraine has focused much attention on the U.S. national security implications of global energy markets. In addition to helping reduce the trade deficit, LNG exports allies and bolster the U.S. ability to influenceglobal energy dynamics.

The presumption of future U.S. supply will impact price expectations and the infrastructure investment decisions that are made today for both export and import facilities around the globe.[10] The promise of U.S. LNG exports in the near term have reportedly proveded greater leverage to countries negotiating new contracts with existing supplies, incuding Russia.[11]

Just a few years ago, the U.S. was expected to be a major importer of natural gas. The shale revolution has eliminated our need for imports, thereby increasing global supplies and reducing prices across the board.[12] Allowing U.S. Henry Hub indexed exports will help sustain lower pricing over the long-term and provide an alternative to oil-linked gas contracts. Lower world prices are a benefit to everyone, and while this could increase competition for the U.S. it will also allow for a more liquid and "free" market.

Transportation

In addition to exports, natural gas can be used domestically in a variety of ways including peaking storage for heating needs and power generation; as an alternative fuel in heavy-duty applications such as oil and gas production and in heavy-duty transportation such as in freight movement via truck, rail or marine. LNG is particularly appealing in heavy-duty applications due to both the economic and environmental benefits.

The primary drivers for the adoption of natural gas as a transportation fuel are performance and cost savings. However, in some instances compliance with regulatory requirements to reduce pollutants such as sulfur dioxide (SO_2), nitrogen oxides (NO_X), and particulate matter (PM) can also drive investment in CNG or LNG as a transportation fuel. Additional benefits include enhanced energy security through the greater use of domestic fuel sources.

Significant potential for natural gas as a transportation fuel exist in the heavy-duty on-road, rail and marine transportation industries. According to EIA, rail consumption is projected to increase from just over 1 trillion Btu in 2017 to 148 trillion Btu in 2040, or 35 percent of total freight rail energy consumption (Figure 7).[13]

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[7] Dooley, Cal. "Prepared Remarks for Cal Dooley." March 5, 2014 http://www.americanchemistry.com/Policy/Chemical-Safety/TSCA/Cal-Dooley-Remarks-at-GlobalChem-2014.pdf

[8] ICF International, "U.S. LNG Exports: Impacts on Energy Markets and the Economy." May, 2013. pg. 7.

[9] ICF International, "Tech Effect: How Innovation in Oil and Gas Explorati October 2012. pg. 4.

[10] David L. Goldwyn, "Refreshing European Energy Security Policy: How the U.S. Can Help ," Brookings Institution (2014). Pg. 1.Institution (2014). Pg. 1.

[11] Id at 1. The following countries have LNG import terminals under construction or proposed: Franc Poland, Spain, Croatia, Estonia, Italy, Romania, and Ukraine.

[12] Charles K. Edinger and Govinda Avasarala, "The Case for U.S. Liquefied Natural Gas Exports," Brookings Institution (2013), accessed June 17, 2014, http://www.brookings.edu/research/articles/2013/02/us-lng-exportsebinger-avasarala.

[13] EIA, "Annual Energy Outlook 2014." May 2014.

We are seeing large-scale, private sector investments in the tech needed to utilize natural gas in high horsepower applications. Companies like Harvey Gulf International Marine based in New Orleans, L commissioned the construction of six LNG powered Offshore Supply Vessels (OSVs). Harvey Gulf expects t in doing so, will have helped revitalize a number of businesses associated with the U.S. shipbuilding industry. By 2016, Harvey Gulf expects to have all six OSVs serving the oil and gas drilling industry o Each of the six vessels in the Harvey Gulf fleet will utilize 90,000 gallons of LNG per month. Harvey Gulf expects to save $1 dollar per gallon in fuel costs and is currently building the first LNG maritime fueling facility in Port Fourchon—a facility which will be capable of storing 270,000 gallons of LNG to support their own growing fleet as well as other maritime companies who are considering natural gas powered vessels.

There are also great examples of public-private partnerships encouraging increased natural gas use in the transportation sector. For example, in the Pacific Northwest, the Washington State Ferries, based in Olympia, Washington. WSF is evaluating LNG as a source of fuel for six ferries. WSF burns more than 17 million gallons of fuel each year. Their analysis has shown that switching from diesel to LNG could save 40-50 percent at today's fuel price. Pending U.S. Coast Guard approval and funding, WSF could begin the first conversion of an Issaquah Class ferry as early as 2016.

As a result of the shale gas revolution, we have seen significant growth in the last two years in the number of natural gas fueling stations. Nationally, there are now 1,378 CNG stations and 94 LNG stations. According to the Alternative Fuels Data Center there are 79 LNG stations planned and another 155 CNG stations planned to open in the coming year. In Texas alone, there are 78 CNG fueling stations and another 24 planned as well as 12 LNG fueling stations with 9 additional LNG fueling stations currently planned. The Texas Clean Transportation Triangle continues to serve as a model for public-private natural gas fueling to help address poor air-quality in the major metropolitan areas in Texas. Since the start of the program in 2011, the TCTT has created nearly 1,000 clean fuel technology jobs, $135 million in direct investment into the Texas economy and allowed fleets like UPS, Procter and Gamble, Waste Management, and Frito Lay to deploy natural gas vehicles (NGV) and recognize the benefits of natural gas as a transportation fuel.

While this growth in the on and off-road markets is encouraging, it is also important to highlight policy decisions that could have a positive impact on the industry and could speed up the pace of adoption. Currently, the NGV industry is supporting the formal adoption of diesel gallon equivalent (DGE) as the measurement to be used for CNG and LNG. This will allow consumers to make simple and accurate cost comparisons. As the use of natural gas in American vehicles is increasing, we believe that enabling consumer adoption should be a priority. This type of policy is exactly what is needed to ensure that our abundant supplies of natural gas continue to experience growth in new market sectors such as transportation. We encourage Congress to support adoption of the DGE standard for CNG and LNG in transportation applications.[14]

Conclusion

The shale energy revolution has allowed us to transition from a posture of energy scarcity to one of energy abundance in just a few short years. As this hearing demonstrates, we have the ability to harness clean, abundant, and affordable natural gas for both domestic consumption and for exports. This paradigm shift is driving economic growth, environmental improvements and enhanced energy security. ANGA will continue to engage policymakers in helping to find solutions to our nation's energy challenges. I am grateful to the Chair, the Ranking Member and the Members of the Committee for the opportunity to testify today on behalf of America's Natural Gas Alliance and I look forward to our continued work together.

The CHAIR. Thank you, Mr. Durbin..

Ms. Rosenberg.

[14] Several Governors as well as a group of bipartisan members of the House of Representatives are formally supporting the gallon equivalency standard.

STATEMENT OF ELIZABETH ROSENBERG, SENIOR FELLOW AND DIRECTOR OF THE ENERGY, ENVIRONMENT AND ECURITY PROGRAM, CENTER FOR A NEW AMERICAN SECURITY

Ms. ROSENBERG. Madame Chair, Ranking Member Murkowski and distinguished members of the committee, thank you for the opportunity to testify on the national security and foreign policy implications of exporting liquefied natural gas.

The United States finds itself today in a radically, more positive energy supply position than that of 5 years ago. Natural gas production has expanded well over 30 percent since 2005. there is new scope for a variety of new gas uses including LNG export.

Washington now has a unique window of opportunity to use new found sources of energy to revitalize U.S. global leadership and the stability of free markets and strength of liberal, international norms. Decisions taken today to export LNG will deepen U.S. trading ties with strategic States tomorrow. They will also bolster the U.S. economy, improve the energy security of partners abroad and allow the U.S. to more effectively spur and support multilateral action to counter international security threats in the years ahead.

The ability to export LNG opens new markets abroad for U.S. natural gas creating new revenue opportunities and economic growth. Exporting LNG will also create an incentive for additional natural gas production which will accrue economic benefits throughout the gas value chain in the United States from well head to export terminal.

A strong economy is fundamental to U.S. national security. It provides the fiscal basis for U.S. leadership abroad including military development and humanitarian relief commitments. The massive and recent increase in unconventional gas has already helped to put the United States in a much stronger financial position.

It has been a leading factor in decreasing the trade deficit which was at its lowest in 4 years last year and has slowed the rate of increase of U.S. indebtedness. Both of these factors will allow the United States new capacity and flexibility to advance foreign policy interests. The United States can further strengthen its hand globally if it exports energy, including LNG.

Another security benefit of exporting LNG is the contributions it will make to a more stable, efficient and diversified natural gas market globally. In Asia, in particular, U.S. LNG exports will also help to lower prices which are currently 3 to 4 times those in the United States. The United States is stronger when our allies and trading partners have efficient, stable markets and have reliable, affordable energy supplies so fundamental to thehealth of any economy.

Stable and diversified natural gas markets in Europe and Asia, primary receiving regions of LNG, will help insulate these economies from potential supply disruptions and importantly, diversified markets will help them to mitigate current or future politicized pricing arrangements from some more traditional suppliers. For example, more diversified markets will undermine the ability of gas suppliers, particularly Russia, to exert coercive market pressure on consumers. U.S. export of LNG is an important policy choice that will help expand U.S. economic opportunity, strengthen national

security and help cement U.S. leadership in the international community.

We should not exaggerate its efforts, however. It is far from a cure all for gas market inefficiency, politicization or instability. It cannot, of itself, bring economic or energy security to our economy or the economies of our allies and partners. As a blunt instrument offoreign policy, it also cannot achieve short term, targeted political aims. Nevertheless, it can promote more stable, competitive and diversified energy markets internationally and a stronger U.S. economy which all redound to the benefit of U.S security.

Refraining from selling LNG abroad in order to support domestic manufacturing interests or to try and stem carbon emissions growth would undermine U.S. foreign relations and the scope of our leadership abroad. It would also cause the United States to lose out economically to other countries that do, by contrast, move ahead now to build export capacity.

As the United States thinks about the energy and foreign policy agenda that can best promote prosperity and our national interest, it must prioritize responsible production of energy and its export.

Thank you for the opportunity to testify. I look forward to your questions.

[The prepared statement of Ms. Rosenberg follows:]

PREPARED STATEMENT OF ELIZABETH ROSENBERG, SENIOR FELLOW AND DIRECTOR OF THE ENERGY, ENVIRONMENT AND SECURITY PROGRAM CENTER FOR A NEW AMERICAN SECURITY

Madam Chair, Ranking Member Murkowski and distinguished members of the Committee, thank you for the opportunity to testify on some of the key considerations associated with production and export of abundant U.S. natural gas supplies. I will focus my remarks on the national security and foreign policy implications of exporting liquefied natural gas (LNG).

The United States finds itself today in a radically more positive energy supply position than that of five years ago. Natural gas production expanded over 30 percent since 2005 to 66.5 billion cubic feet per day in 2013./1/ Imports fell sharply, roughly 66 percent in this time./2/ This abundance, along with 100 years' worth of reserves in the ground at current consumption levels, has led to the redesign of terminals intended to receive LNG only five years ago. They are now intended to export this commodity and will compete with other proposed new facilities to move gas overseas. The United States is expected to send LNG abroad at the end of next year or in early 2016, and is forecast to be a net gas exporter by 2018.

In a period of tremendous geopolitical uncertainty, and when many questions exist about the future role of the United States in the world, Washington has a unique window of opportunity to use newfound sources of energy to revitalize U.S. global leadership and the strength of free markets and liberal international norms. Exporting LNG will deepen U.S. trading ties with strategic states, including those in Europe and Northeast Asia. It will bolster the U.S. economy, improve the energy security of partners abroad and allow the U.S. to more effectively spur and support multilateral action to counter international security threats. To enhance energy and national security, and reduce the ability of potential adversaries to use energy as a weapon of coercion, a new national energy policy should actively embrace a more nimble and supportive regime for LNG exports.

Exporting LNG Enhances U.S. Economic Growth

The ability to export LNG opens new markets abroad for U.S. natural gas. In turn, this creates new revenue opportunities and strengthens the U.S. economy. Exporting LNG will also create an incentive for additional natural gas production, which will accrue economic benefits throughout the gas value chain in the United States, from wellhead to export terminal. In two recent studies by NERA Economic

[1] U.S. Energy Information Administration, U.S. Natural Gas Imports, (May 30, 2014). http://www.eia.gov/dnav/ng/hist/n9100us2a.htm

[2] Ibid.

Consulting, analysts concluded that exporting LNG will have positive benefits for economic growth and the trade balance. Furthermore, they found that "the greater the level of exports, the greater the benefits."/3/

A strong economy is fundamental to U.S. national security. It provides the fiscal basis for U.S. leadership abroad, including military, development and humanitarian relief commitments. Also, it is what enables the United States to be the world's only superpower. The massive and recent increase in unconventional gas has already helped to put the United States in a much stronger financial position. It has been a leading factor in decreasing the trade deficit, which was at its lowest in four years last year, and has slowed the rate of increase of U.S. indebtedness. Both of these factors will allow the United States new capacity and flexibility to advance foreign policy interests. The United States can further strengthen its hand globally if it exports energy, including LNG.

LNG exports are expected to offer a modest but meaningful contribution to economic growth and security. The volume of exports may range from five to nine billion cubic feet per day between 2020 and 2025./4/ A variety of factors determines the price for natural gas and planned LNG exports. These include various demands for gas from the U.S. sectors of residential heating, power generation, industrial manufacturing and transport, as well as export demand. Gas supply is relatively elastic in the United States, but these competing demands will likely increase natural gas prices somewhat. Price increases will be felt particularly by low-income consumers and will contribute to more muted growth in certain particularly gas-intensive manufacturing sectors. However, even with many demand sources and increased gas prices, sustained and expanding macroeconomic growth is expected. Using current projections for LNG export volumes, revenue from LNG exports will make a contribution, though relatively minor, to the U.S. gross domestic product (currently valued at well over $16 trillion) over the next decade.

In broad terms, any opportunity to expand economic growth, including ones that will keep natural resource rents at home, will help build U.S. economic vitality, security and standing abroad. When such opportunities involve expansion of exports and greater integration of the U.S. economy with foreign trade partners, they will expand U.S. clout and capacity for leadership. For this reason, LNG exports will make a contribution to economic growth and security. By contrast, restraining the export of LNG in order to support domestic gas-intensive manufacturing industries will cause the United States to forego an opportunity for economic growth and expansion of trade. This will undermine foreign relations and the scope of U.S. leadership abroad.

LNG Exports Improve Global Gas Market Competition and Security

An additional and more significant contribution to national security that the export of LNG will offer is to help make global natural gas markets more stable, efficient and diversified. The United States is stronger when our allies and trading partners have efficient, stable markets and have reliable energy supplies so fundamental to the health of any economy. Stable and diversified natural gas markets in Europe and Asia, for example, will help insulate these economies to potential supply disruptions. Stable and diversified markets will also help them to mitigate current or future politicized pricing arrangements from some more traditional suppliers. They will also undermine the ability of gas suppliers, including our adversaries and enemies, to exert coercive market pressure on consumers.

LNG Export Will Contribute to European Energy Security

The recent U.S. boom in natural gas production has contributed directly to greater gas supply diversity and competitive prices in European markets. LNG imports to the United States slowed to a trickle over the last several years, and cargoes of LNG destined for the United States were redirected to Europe and elsewhere. These new LNG supplies gave European consumers greater leverage with Russia's Gazprom in

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[3] NERA Economic Consulting, Macroeconomic Impacts of LNG Exports from the United States, December, 2012, http://energy.gov/sites/prod/files/2013/04/f0/nera_lng_report.pdf. Also, NERA Economic Consulting, Updated Macroeconomic Impacts of LNG Exports from the United States, March, 2014, http://www.nera.com/nerafiles/PUB_LNG_Update_0214_FINAL.pdf.

[4] Analysts vary on the volume of LNG that will be exported by the United States over the near to medium term, though most offer a range of roughly five to nine billion cubic feet per day. For example, IHS estimates that U.S. LNG export capacity will reach 5.7 billion cubic feet per day by 2020: IHS CERA, Fueling the Future with Natural Gas: Bringing It Home, January 2014, XI-5,http://www.fuelingthefuture.org/assets/content/AGF-Fueling-the-Future-Study.pdf. BG Group estimates that the United States will export the equivalent of 7.95 to 9.27 billion cubic feet per day by 2025: Chris Finlayson, "Global LNG Update", (report presented at the Howard Weil Energy Conference, New Orleans, Louisiana, March 23-27, 2014) http://files.the-group.net/library/bggroup/files/doc_526_t.pdf.

supply negotiations. As a direct consequence, European companies have been able to exact more favorable pricing arrangements in some gas contracts. This is a boon for European consumers, who depend on Russia for 30 percent of their gas supplies.

The expectation of U.S. LNG exports entering the global gas market, whether cargoes will land in Europe or travel to other destinations, gives additional leverage to Europeans in future price negotiations with Gazprom. Russia will have to concede more favorable terms with European consumers to keep market share. However, even while U.S. LNG will help to diversify supply sources in Europe, and thereby help reduce the cost of some Russian gas, it will not drive down the price of gas substantially. The cost of U.S. gas plus liquefaction and transatlantic transport fees will mean it only slightly undercuts European gas prices, and therefore will only slightly drive down European equilibrium prices.

Another benefit to European energy security derived from U.S. LNG export is the signal it will send to investors to build new LNG receiving and gas pipeline infrastructure. This will help make the European market more efficient and more resilient in the face of a potential supply disruption from one source or supplier. There are, of course, various other measures necessary to improving efficiency and resiliency of the European gas market, and to reducing European vulnerability to politicized Russian gas pricing. Significantly, Europe should develop new indigenous gas resources, reform market and gas pricing mechanisms and build new pipeline interconnector and transmission infrastructure. Additionally, Central and Eastern European countries in particular should adopt greater energy efficiency practices and the use of alternative energy resources

The crisis in Ukraine, spurred and sustained by ongoing disagreements between Moscow and Kyiv about gas pricing, highlights the vulnerability of heavy dependence on Russian gas among Eastern and Central European countries. U.S. LNG cannot offer immediate relief to Ukraine, both because Ukraine lacks the infrastructure required to receive LNG cargoes and because of the unavailability of U.S. supplies at present. Indeed, helping Ukraine manage this week's supply-cut off of Russian gas or erasing Russia's dominant position as a European gas supplier is beyond the scope of what any LNG supplies to Europe can provide. However, the potential for U.S. LNG exports to diversify European gas supplies and increase competitiveness is evident. Permitting and promoting the export of U.S. LNG will expand and diversify the supply of LNG from reliable sources in the global market. This will boost European energy security and help to erode Russia's coercive pricing and political leverage.

LNG Export Will Positively Shape a Developing Asian Market

In contrast to Europe, where U.S. energy policy is aimed at addressing insecurities that ensue from well-established and relatively inflexible market dynamics, many important contours of the future Asian energy market are being determined now. Today's policy and investment choices will shape the region's economic and security future for decades. Unlike most national security decisions, which are typically reactive and short-term, in this case the U.S. government has the unique opportunity of having the tools and the foresight to help shape a crucial element of Asia's geopolitical future. It would be irresponsible to fail to employ those tools and find ourselves decades from now wondering why the United States did not act when it had the chance.

Exporting LNG to Asia will help to diversify gas supplies and reduce prices. It will also fetch lucrative returns for U.S. suppliers. Natural gas prices in Northeast Asia are roughly three times more than they are in the United States, and one and a half times European prices. This differential will likely pull the majority of U.S. LNG exports to Asia, and meaningfully alter LNG trade patterns in the Asia-Pacific region.

Given the large LNG import dependence of Japan and South Korea, the largest and second largest global LNG importers, substituting lower cost U.S. LNG for current higher cost LNG imports will have several important economic benefits. Notably, it will reduce the massive Japanese trade deficit, and in both countries it will boost gross domestic product by reducing its energy costs. In turn, this will allow Japan and South Korea to become even more significant trading partners and investors in the United States. Japanese LNG imports, which have soared in the wake of the 2011 Fukushima Daiichi nuclear disaster, pushed the Japanese trade deficit to its highest-ever level last year. According to an analysis from Japan's Institute of Energy Economics, the amount of U.S. LNG currently committed to Japanese buyers from those U.S. export projects with DOE permits is equal to about 20 percent of Japanese LNG imports last year. Lowering the costs of this quantity of Japan's LNG imports would represent a substantial economic gain.

The export of U.S. LNG will also give Asian consumers more supply options. This will help to ensure that they are not pushed into significant, politicized contracts with Russia for lack of sufficient alternative supplies. Asian gas demand is expected to grow 70 percent by 2025, and more than double by the year 2035, according to the International Energy Agency,/5/ and Russia aims to be a substantial supplier to this region. With last month's Gazprom-CNPC gas pipeline deal to supply 38 billion cubic meters of Russian gas annually to China, Russia locked in an important Asian market share. It also has substantial LNG supply aspirations to meet gas demand in the rest of Asia, the largest LNG importing region. However, the entrance of U.S. LNG, or LNG from other suppliers such as Australia, Canada and East Africa, will help Asian consumers to bargain hard with Russia for future supplies and attract more affordable, stable terms.

Northeast Asia harbors myriad sources of insecurity. The Korean Peninsula, Taiwan, maritime disputes and the broader U.S.-China competition could all produce crises and conflicts in which Russia, alone or in collaboration with China or North Korea, is tempted to use natural gas as an instrument of coercion. It has done so in Eastern Europe and there is no reason to believe it would not do so in Asia as well. The United States has the ability to limit Russia's future capacity to use energy to twist the arms of America's friends and allies, if it adopts pro-export energy policies now.

U.S. LNG Exports Will Travel on More Secure Maritime Routes

Supplies of LNG moving from the U.S. market to Europe and East Asia will avoid traveling through conflict-prone regions and maritime hot spots. Unlike LNG supplies from the Persian Gulf, for example, U.S. LNG cargoes will sail shorter distances through open waters of the Pacific to reach East Asian consumers. Exports from the United States will avoid the South and East China Seas and the Straits of Hormuz and Malacca, where territorial dispute, piracy and terrorism pose a greater risk to marine vessels. The United States is a very stable jurisdiction and the threat of Middle Eastern conflict, like the destabilizing and violent upheaval we see now in Iraq, poses no supply disruption concerns for potential future purchasers of U.S. LNG.

Exporting LNG Will Strengthen Strategic Allies

The United States will be in a better position to achieve more of its foreign policy and economic objectives when it collaborates closely with economically vital and energy secure trading partners. The United States suffers when its trading partners experience energy supply disruptions or when their economies falter due to unaffordable energy costs. In a highly globalized economic system, and in anticipation of more interconnection between regional natural gas markets in the future, the United States has a fundamental strategic interest in promoting stable, diversified gas market arrangements and more liberalized trade.

Europe will be a stronger security partner to the United States with more competitive natural gas prices and supply diversity, and the energy security to which these factors will contribute. Investing in the transatlantic partnership, from expanding trading ties to enhancing NATO military and diplomatic capacity, will allow European partners to more ably pursue shared security objectives with the United States. This includes diplomatic and economic efforts to limit Russia's destabilization of eastern Ukraine and other countries on its periphery, such as Georgia and Moldova. It also includes joint action on economic sanctions, including those targeting Iran and Syria, and collective peacekeeping or military efforts.

Northeast Asian treaty allies of the United States will also be stronger security partners as a result of U.S. LNG supplies, and the resulting improved gas market and economic conditions. Expanded economic growth and stability will enhance the ability of key U.S. allies to boost military spending and invest greater attention and resources into joint security efforts. U.S.-Northeast Asian alliances play a critical role in maintaining U.S. power and presence in Asia, and it would be strategically wise and economically prudent to take all appropriate policy steps to strengthen these states. Japan and South Korea will look favorably on a U.S. LNG export policy that will effectively benefit their energy market conditions. Indeed they have actively advocated for such exports to U.S. policy and business leaders in recent years. Japanese and South Korean leaders will also perceive LNG exports as a meaningful economic component in the U.S. administration's policy to "rebalance" strategic focus to Asia.

For China, the expansion of trade ties with the United States to include LNG could contribute to a more constructive bilateral relationship. A more significant

[5] International Energy Agency, World Energy Outlook 2013, 578 & 596.

U.S. position in Asia's energy markets should serve as a source of caution and restraint in Beijing, even with sometimes cool diplomatic ties between the U.S. and China, particularly as Beijing behaves in an aggressive and provocative manner in territorial disputes with neighbors. Also, support for more liberalized LNG trade will give the United States a stronger leg to stand on in trade organizations and international negotiations to demand that China not withhold high value natural resources, such as rare earth minerals, from the international market. Building shared liberal economic norms will support U.S. interests and increase the potential for greater economic integration and mutually beneficial growth.

The economic and strategic benefits of liberalized trade are something that U.S. policymakers have acknowledged and touted, at least in theory, for decades. Its national security and foreign policy value is also evident, though difficult to quantify. Liberalized trade regimes for energy are even more important than ever in the United States today, when abundant energy production and export capacity align so poorly with restrictive and outdated export rules. In the present market conditions, one of the most practical ways for the United States to promote secure and diversified gas markets globally, and to reap the geopolitical advantages of its energy abundance, is to take an active role in global LNG trade.

The Market Needs a Stronger Signal of Administration Policy on LNG Exports

The recently-announced Department of Energy (DOE) proposal to alter the LNG export authorization process is a positive step, but additional measures need to be taken to secure a role for the U.S. as a leading LNG exporter in the near- and medium-term. The DOE proposal would do away with conditional authorizations of LNG export projects that will supply countries with which the United States does not have a free trade agreement, and thus makes the LNG project approval process more rational. This move will, as intended, elevate more commercially viable projects in the regulatory approval process. It will also ensure that applicants that have completed the environmental review will not be delayed by their position in the current order of precedence. However, it will not meaningfully accelerate the plodding pace of LNG export project development. The time-intensive environmental review process, which will not change, is likely still to constitute the lengthiest part of the new proposed process. The proposed new rules also do not clarify whether the administration plans to cap LNG exports.

The United States is an extremely attractive potential supplier of LNG in the post-2018 period, the period after which the bulk of currently planned LNG projects will be up and running. However, without a clearer policy signal from the administration that the United States is committed to as robust an LNG export capacity as the market will bear, potential investors in many proposed projects are hanging back. Assurances from the DOE that the United States supports LNG exports have clarified that there will be at least some LNG export capacity permitted in the United States. However, the administration has offered no firm guidance on the potential extent of LNG export capacity nor signaled a clear policy of non-interference with the market. Without this, foreign companies remain worried that the United States will cap LNG exports if there is a domestic gas market crisis, price spike or political opposition.

Competitor developers of LNG export facilities abroad are delaying plans and carefully watching the slow progress of U.S. LNG projects. They will move forward to supply LNG demand if the United States does not. But in the current "wait and see" period, regional and global energy security risks grow. United States policymakers should expressly support an export policy to lock in a share of the expanding LNG market and enhance market stability and supply.

Conclusion

U.S. export of LNG is an important policy choice that will expand U.S. economic opportunity, strengthen national security and help cement U.S. leadership in the international community. It is far from a cure-all for gas market inefficiency, politicization and instability. It cannot, of itself, bring economic or energy security to our own economy or the economies of our allies and partners. As a blunt instrument of foreign policy, it also cannot achieve short-term, targeted geopolitical aims. It can nevertheless promote more stable, competitive, and diversified energy markets internationally, which redound to the benefit of U.S. security. By strengthening the economy, by helping to make allies in Europe and East Asia less dependent on unstable and politicized supply, and by promoting energy stability internationally, more liberalized gas trade and the export of LNG is in the American national interest.

The CHAIR. Thank you very much. An excellent panel, very diverse views and we look forward to the questions.

Let me submit to the record the FERC decision today which is the second decision to approve an export facility which would be the Sempra permit. I'd like to submit that to the record because it leads into my first question that I want to ask all the panelists starting with you, Mr. Smith and each one.

The CHAIR. There are numbers flying around about how much has been approved for export. I want to spend my time clarifying that and trying to get all 5 of you to agree on one number because there is one number. It can only be one.

So, Mr. Smith, if I asked you the number of the volume of gas that has approved to date including this was released earlier today. What would that number in volume be? What is your understanding of the FERC final approval number?

Mr. SMITH. Thank you for the question, Chair Landrieu.

So, to date FERC has—well, the Department of Energy.

The CHAIR. FERC.

Mr. SMITH. FERC, OK.

The CHAIR. Approval number for FERC. There are only 2.

Mr. SMITH. So for FERC they've approved the 2 applications, 2.2 for Sabine Pass and then the 1.7 for——

The CHAIR. So that's 3.9?

Mr. SMITH. In total.

The CHAIR. OK, Mr. McNally, do you agree with that or disagree?

Mr. MCNALLY. I will agree with my colleague on 3.9.

The CHAIR. Mr. Weiss, do you agree or disagree?

Mr. WEISS. Based on the DOE tracking of the approved things, I would say about 11 million cubic feet.

The CHAIR. No, that's not the question.

Mr. WEISS. I understand.

The CHAIR. So I want you to answer my question.

Mr. WEISS. I would then——

The CHAIR. I did not ask you about the tracking.

Mr. WEISS. Right.

The CHAIR. I'm going to be very respectful of you. I want you to give me the answer that I—the answer the question that I asked.

How much has been approved by FERC to date?

Mr. WEISS. I'm not in a position to answer that because I've only been—because I believe that the——

The CHAIR. It's not what you believe.

Mr. WEISS. Right.

The CHAIR. It's just what it is.

Mr. WEISS. OK. Then I'm not in a position to answer that.

The CHAIR. OK. I'm going to ask you to submit that in writing because you——

Mr. WEISS. Be happy to.

The CHAIR. You could do some research on that and just get it to us before the close of the hearing date.

Mr. Durbin, what do you believe the figure is? Would you——

Mr. DURBIN. I agree with Mr. Smith. What has been approved by FERC is 3.9.

The CHAIR. 3.9.

Ms. Rosenberg.

Ms. ROSENBERG. I also agree, 3.9.

The CHAIR. OK. Now I'd like to ask all of you what do you acknowledge is in the general queue? That would be the answer to Mr. Weiss?

What is in the general queue? Now that's an interesting queue because it's been changed recently. So I want to try to be clear about what I'm asking.

What do you believe, Mr. Smith, because this is under your general jurisdiction, is in the queue for approval by FERC that is either in the process of getting its environmental review? What number would you put on that?

Not in the total queue, in the queue that is likely to receive approval?

Through the FERC process?

Mr. SMITH. Alright. Thank you for the question.

That question is a little more subjective when you're saying, you know, what projects are likely to move forward and which ones aren't.

The CHAIR. OK. How would you ask it then? Maybe what projects have spent upwards of $100 million on their application?

As of August 6, 2014, the FERC has issued three orders granting authorization to site, construct, and operate facilities for the liquefaction and export of domestically produced natural gas to: 1) Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC, subsidiaries of Cheniere LNG, Inc., which is a subsidiary of Cheniere Energy, Inc. up to a volume of approximately 2.2 billion standard cubic feet per day (Bcf/d); 2) Cameron LNG, LLC, a wholly-owned, lindirect subsidiary of Sempra Energy, up to a volume of approximately 1.7 Bcf/d; and, 3) Freeport LNG Developmen, L.P. up to a volume of approximately 1.8 Bcf/d. In total, the FERC volumes authorized are approximately 5.7 Bcf/d.

Before a project sponsor can file with the FERC for an order and certificate to site, construct, and operate facilities for the liquefaction and export of demestically produced natural gas, the project sponsor must be accepted for FERC's pre-filing process. Once accepted to begin the pre-filing process, the project sponsor completes FERC's resource reports. Resource Report 13 includes significant engineering design and mass and material balance estimates of the proposed project, at a significant cost to the project sponsor.

As of August 6, 2014, by DOE's estimate, there are nine applications pending at the FERC seeking authorization to site, construct, and operate facilities for the liquefaction and export of domestically produced natural gas, in a total volume of 12.7 Bcf/d. Combined with the already FERC authorized volume of 5.7 Bcf/d, there would be a total of 22.3 Bcf/d of FERC-authorized domestically produced liquefied natural gas export facilities that may be approved at some time in 2015.

Additionally, at least three other project sponsors are in the pre-filing stage with the FERC, and DOE has heard from several DOE applicants that they intend to begin the pre-filing process with the FERC in the near future.

Mr. SMITH. Perhaps so, Chair Landrieu.

You know, the response that—I don't have that number, you know, at my fingertips because we'd have to look at all those applications.

The CHAIR. OK.

Mr. McNally, do you? Because if not, I'm going to ask—I'm going shape this question very clearly and then ask you all to submit it.

Do you have any idea how many would be in the queue of FERC?

DOE has no way of knowing which, if any, of these other proposed projects will result in a FERC order and certificate. For example, in the mid-2000's over 40 projects were proposed to be built to import liquefied natural gas, and only eight were built.

Mr. MCNALLY. I do not. I've come, in my time in Washington, to believe you only have what you have in your hand. My number is 3.9 and no more.

The CHAIR. OK.

Mr. Durbin, any ideas or Mr. Weiss?

Mr. WEISS. Thank you.

I believe 11 billion cubic feet per day has been approved with another 26 billion cubic feet in the queue.

The CHAIR. Oh, that is—yes, OK.

Thank you.

Mr. Durbin.

Mr. DURBIN. I think you're asking the right question. I don't have the specific answer, but we will certainly submit.

The CHAIR. OK.

Ms. Rosenberg, do you have any idea?

Ms. ROSENBERG. I will also defer to the colleagues here. I don't have the exact number, but can look into it.

The CHAIR. OK.

The reason I'm pressing this number is because it's really important for us to understand what has been approved, what is pending because part of, I think, what this committee is going to try to ascertain is what is the right balance of exports to domestic. I think having those numbers is really important.

But the record should reflect that 4 of the 5 panelists agree that 3.9 is all that has been approved to date. As of August 6, 2014, by DOE's estimate, there are nine applications pending at the FERC seeking authorization to site, construct, and operate facilities for the liquefaction and export of domestically produced natural gas, in a total volume of 12.7 Bcf/d. Combined with the already FERC authorized volume of 5.7 Bcf/d, there would be a total of 2.3 Bcf/d of FERC-authorized domestically produced liquefied natural gas export facilities that may be approved at some time in 2015. Additionally, at least three other project sponsors are in the pre-filing stage with the FERC, and DOE has heard from several DOE applicants that they intend to begin the pre-filing process with the FERC in the near future. Then we're going to use the questioning to try to ferret out what is actually, potentially, there from a potential approval and what is just going to fall by thewayside.

The other question that I want to get is the volume of recoverable resources.

Mr. Smith, what did you testify today, the volume of recoverable resources of gas in the United States based on your estimates today? I know it's a moving target.

Mr. SMITH. Thank you for the question.

I did not have that number within my testimony and numbers——

The CHAIR. OK.

Would you submit that for the record?

Technically recoverable resources (TRR) are resources in accumulations producible using current recovery technology but without reference to economic profitability. They include both proved reserves and unproved resources.

DOE/FE notes that the Energy Information Administration's (EIA) U.S. natural gas TRR estimates are 2,266 trillion standard cubic feet (Tcf) in the EIA's Annual Energy Outlook 2014 (AEO 2014). These TRR estimates include proved nad unproved TRR shale gas resources. In AEO 2014 unproved shale gas TRR was estimated at 489 Tcf.

The CHAIR. Mr. McNally, do you know what your folks are projecting?

Mr. MCNALLY. Yes, mine would be 330 trillion cubic feet.

The CHAIR. OK.

Mr. Weiss.

Mr. WEISS. I don't have that, but I would go with what Mr. Durbin says because he's been looking at it very carefully.

The CHAIR. What did you say, Mr. Durbin?

Mr. DURBIN. Total recoverable?

The CHAIR. Recoverable?

Mr. DURBIN. Total recoverable, again, you've got 3,600 TCF.

The CHAIR. OK.

Ms. Rosenberg, do you have something?

Ms. ROSENBERG. I was going to have said technically recoverable gas is set at 2,431 TCF.

The CHAIR. OK.

Finally, I want to submit to the record. There have been 5 studies, the NERA study, the ERA Update 2012–2014, Brookings 2012, Dan Yergin's firm which is very well respected, 2012, and then Charles Rivers then has a very liberal number. I'd like the staff to compile thesestudies and put it into the record. If there are other members that have documents that would lead us to come to a very final conclusion about what the estimates are today. They could go up in the future, but what they are today, of the recoverable resources in the United States.

The CHAIR. Then finally I want to submit, this is the Natural Gas Act of the United States. It was first passed in 1938. That would be right after, some years after the Great Depression and before World War II.

It has only been amended twice on the section of exports since 1938. It's 2014. So I think this needs a little work.

That's what this committee is going to be about doing.

Thank you.

The CHAIR. Ranking member.

Senator MURKOWSKI. Thank you, Madame Chair. Appreciate the inquiry into the numbers because I do think it is important that we understand and come to an agreement about what we're really talking about here.

Just with regards to the process. Mr. Smith, this goes to you.

It would appear to me that we've fixed the front end of the process, the middle end—excuse me. The middle area there with FERC seems to be moving forward. But what we haven't addressed here is what happens on the back end the challenges with the final DOE order. The fact thatit appears to just be open ended. There's no time table for these final licenses here.

What would be your reaction, the Department's reaction, to Congress legislating that DOE has some time frame here following the final approval from FERC to make its own final assessment? In other words, to put a back end in it?

You're in a situation where NEPA has already been completed then which, of course, is that lengthy unknown. Would a month period be sufficient, 6 months, the merits of allowing for some level of certainty or finality to the process here through DOE?

Mr. SMITH. Thank you very much for the question, Senator.

First of all, we appreciate and understand the interest, your interest in the markets, interest in certainty around this process. That's been a principle that we've endeavored to preserve throughout our entire process of evaluating these applications.

When we announced our proposed process change we did not put in place a time limit. Instead we continued with our—the commitment we've always made to make sure that we're moving forward as appropriately and expeditiously as possible to make good public interest determinations.

Senator Udall mentioned the possibility that's included in the bill that's currently being proposed to include a time limit. Again, that's not something we've included in our process change or that——

Senator MURKOWSKI. Is it something that you think would make sense to provide that level of certainty and expediency to a process?

Mr. SMITH. Indeed we always are going to uphold the letter in the spirit of the law that would hold our feet to the fire, certainly. Ensure that there's a start and close to the process. Within that time limit we would make sure that we made a good and appropriatepublic interest determination.

Senator MURKOWSKI. Let me ask the question and I think I'll direct this, well, Mr. McNally, it was initially directed to you. But I can have others jump in here as well because we talk about the opportunities for us as a Nation with these amazing reserves and resources that we have not only for the benefit of this country, but for the benefit of our friends and allies.

But yet, it's not just us that has this. It has been mentioned that there are other Nations, clearly, that have the ability to jump into this market. They are our competitors in that sense. So when we talk about an opportunity for us from a global, competitivenessperspective, if we have a process that doesn't allow for a timeliness and for a level of certainty, how competitive are we really out there in that global marketplace?

Mr. McNally, Mr. Durbin and anyone else who would care to comment?

Mr. MCNALLY. Thank you for that. If I could I will be correcting myself. I gave you, Madame Chair, the proved economic reserves. I'll be adding a zero and giving you another number for total technologically recoverable reserves.

Mr. MCNALLY. Senator Murkowski, you're absolutely correct. There's a window we have to jump through. We have our old competitors, Qatar and Australia, having built or in the process of building world class facilities. We have new kids on the block. Tanzania and Mozambique and perfectly placed to compete in Asia, who will be bringing on huge projects.

We have to jump into that window. It takes many years to finance and build and construct a project, even with a quick approval process. So we do have this window. There are enormously long lead times in this industry. It's crucial that we move quickly to get our companies inthe game.

Senator MURKOWSKI. Mr. Durbin.

Mr. DURBIN. I included in my written testimony, in fact in figure 6. There's a chart in there.

But the answer to your question is that, you know, right now we believe that in the next 10 years or so there's about 18 to 38 BCF of incremental demand globally. If you look outside of the U.S. there's already about 50 BCF of projects that are planned or potentially beingbuilt. Not all of those are going to be built.

In the U.S. we took all of our, the applicants, it would be north of 30 BCF a day. Again, not all of those are going to be built.

The more important point is we've only got that little, that incremental demand, that's available. If we don't move quickly to be able to make sure that we get part of that market. Again, it's going to be the early movers that are going to have a competitive advantage inthat global market.

Senator MURKOWSKI. Madame Chairman, my time is expired. But I will note for my colleagues here that we here in Alaska know what it means when we're talking about a window of opportunity because it was just a few short years ago that Alaska was looking to move its natural gas resource. The whole prospect was moving it across Canada and then bringing it into the lower 48 States.

We lost that window of opportunity as a State. It is no longer on the table. It is no longer part of the consideration. We're trying to figure out, OK, where is the market for Alaska gas. But windows of opportunity do not stay open indefinitely.

The CHAIR. Thank you.

This is the queue that I have, Senator Heinrich, then Senator Barrasso, then Senator Udall, Manchin, Franken, Baldwin and Stabenow.

Senator MURKOWSKI. Do you have Hoeven in there?

The CHAIR. Hoeven.

Go ahead, Senator Heinrich.

Senator HEINRICH. I want to start with Deputy Assistant Secretary Smith and then I'll, kind of, throw this open to any of you who want to offer your thoughts.

When consumers think about this they generally think about price. They understand that these decisions are going to have some impacts on prices. Taking the bookends aside, I think there's a fair amount of consensus that the sweet spot would be somewhere where there's a highenough price to incentivize production.

Certainly New Mexico is a production State. We produce a lot of natural gas. We like this, the price, to be somewhere where they're not shutting in those wells.

But also low enough to maintain this competitive advantage that we've seen in recent years that's been good for consumers. It's been great for manufacturing jobs.

Do you have an opinion of, kind of, where is that——where's the range in terms of price point? Should our policy and the tools that you have such as export approvals and controls be aimed at trying to move us into and maintain us in that kind of a sweet spot?

Mr. SMITH. Thank you, Senator, for that question.

So this kind of goes to the heart of the public interest decision that we are dealing with when we're looking at LNG exports. So as I mentioned in my testimony the Natural Gas Act, Section 3 of the Natural Gas Act, gives us fairly broad latitude in defining what publicinterest means. It's not defined in the law so we have to make that clear in the orders that we write.

So when we look at public interest we look at a number of issues.

We look at prices, as you mentioned.

We look at the impact on American consumers.

We look at the impact on American manufacturers.

We look at balanced trade.

We look at economic issues.

We look at job creation.

We look at environmental issues.

We look at international issues.

So there's a very broad range of issues that we are compelled to consider when we're looking at each of these applications and determining whether or not that particular export application is in the public interest.

Price, certainly is one of those issues. It's one that certainly gets a lot of attention when we think about public interest determination.

So how have we handled this?

When we evaluated the first final authorization that we've issued, we contracted the study that was referenced earlier that was conducted by NERA. It looked at all of these issues including price and the important relationship between supply, demand and price and price elasticity for natural gas.

That helps us understand the potential impact on jobs.

It helps us understand the potential impact on manufacturers and on consumers.

So rather than targeting a particular range which is something we have not done, we have to look at these questions holistically. So the NERA study is one of the studies that we have evaluated, entered into the public record, put out for public comment and have referenced inprevious conditional authorizations.

We also have to consider in the public review process comments that we get in from a broad range of stakeholders. Here on this panel and amongst the members of this committee we do here, even here, are very broad range of views on the pros and cons of export. So we have toconsider all those in a holistic way. So that's the way that we've attempted to make sure that we're making good, judicious, public interest determinations that consider all of these factors.

Senator HEINRICH. Go ahead.

Mr. WEISS. Senator Heinrich, right now the Asian market is about, the price is about 4 times our price here. The European market is about 60 percent higher than our price here. Our low price has many domestic advantages.

It has helped breed manufacturing jobs.

Natural gas has become a substitute for dirtier coal that helps protect children from asthma attacks and other lung issues.

It helps with the climate.

Raising that price significantly would have an effect that would be negative here even though, you know, it may help the companies that are exporting the natural gas to other Nations. So I think before we get to approving applications where we're going to look at moreexports we ought to look at what's going to be the domestic impact of more exports on our price, wages, jobs and health.

Senator HEINRICH. OK.

Go ahead.

Mr. MCNALLY. Senator Heinrich, the study that Mr. Smith just mentioned noted that our consumers and our gas intensive industries will always enjoy the lowest prices and the most competitive advantage compared to other folks. The reason is because the cost of transporting, of liquefying and transporting gas is so high that our friends in Asia and Europe will always be paying double or triple what we're paying. So whatever our price is $4,$6, whatever it is, we will always have the lowest cost gas because of those advantages.

Mr. DURBIN. Senator, if I could?

I would frankly argue that the basic—the size of the resource we have, our ability to continue producing it at affordable prices, I think, it has essentially made the concept of a sweet spot irrelevant. We are going to be able to continue to produce. Meet the demand we have here. Be able to get into this, what is a very finite, global market for LNG.

Senator HEINRICH. Go ahead.

Ms. ROSENBERG. Just a tag.

Senator HEINRICH. I'm over my time so——

The CHAIR. He's over his time so quickly, please.

Ms. ROSENBERG. On the issue of increased prices I would just add that one of the primary things to keep in mind in a scenario where they do, in fact, increase, is tothink about how we can insulate consumers and our economy from that. One of the key ways to do that is, of course, increasing our energy efficiency and thinking about those most vulnerable low income populations that are most significantly affected.

Senator HEINRICH. Thank you, Madame Chair.

The CHAIR. Thank you so much. Excellent questions.

Senator Barrasso.

Senator BARRASSO. Thank you, Madame Chairman.

Mr. Smith, on March 24th the Department of Energy approved the export application for the Jordan Cove LNG export terminal. This terminal would be located in Coos Bay, Oregon. It would enable natural gas producers in Wyoming, Colorado, Utah, to export LNG to internationalmarkets including markets in Asia.

The DOE's conditional license order for the Jordan Cove terminal reads as follows. "To the extent U.S. exports can diversify global

LNG supplies and increase the volumes of LNG available globally, it will improve energy security for many U.S. allies and trading partners."

Immediately afterwards the order States, "As such authorizing U.S. exports may advance the public interest for reasons that are distinct from and additional to the economic benefits to the United States."

So I'm encouraged to see the DOE recognizes that LNG exports from the United States will improve the energy security of our allies and as a consequence, promote the public interest.

So would you please expand a bit on how you see LNG exports from the U.S., including LNG exports to Asia, improving energy security of our allies?

Mr. SMITH. Thank you very much for that question, Senator.

So as you note in that latest conditional authorization that we issued, the language around international issues was slightly different than the language that we'd concluded in previous orders which does reflect the fact that we're constantly looking at the market and global events when we think about this part of public interest determination.

As we stated in the order, we're thinking about broad range of things on a public interest determination including the importance of making sure that we're cognizant of the challenges and opportunities that are faced by our allies and our trading partners around the world, as been seen in recent world events. So that's something that's important for us to consider.

So if we look at how U.S. gas markets potentially impact global markets one thing to observe is that we've spoken here about the tremendous benefit, the tremendous change in industry that we've gotten out of technological advances in unconventional oil and natural gas to increase production here. We're yet to export any LNG from the lower 48. The first terminal is still being constructed.

But the advances here in the United States are already having a tremendous impact on global markets. Those cargoes that initially were destined for the United States, that were going to be coming to the U.S. to supply demand here domestically are now available for consumers in Asia, for consumers in Europe. So we're already having impacts simply through the successes that we're having involving natural gas domestically.

Now that said, the ability to target particular countries is limited. When the Department of Energy issues an application that allows an applicant to export LNG, we don't tell that applicant where to send the molecule. That's determined by the private sector, by the privatemarket. They send the market. They send that molecule where it has the highest demand.

So when we think about assisting our allies and trading partners certainly we're cognizant of the fact that more gas in the market can be positive in that way. But we have to be, you know, have some humility about our ability to focus and direct and send molecules to a particular destination in a way that's effective for a certain, immediate issue.

But it's a general statement of our recognition. These are important issues. We'll continue to consider them in future final orders.

Senator BARRASSO. While I'm grateful for your answer. I'm very encouraged that the DOE recognizes that U.S. LNG exports will improve energy security of our allies, our trading partners. I do remain concerned that the Department of Energy is still not acting with enoughurgency. As Senator Murkowski said, windows of opportunity can close.

With enough urgency on pending LNG export applications, I think it's been in about three and a half years the Department has approved fully one application, approved 5 other proposals but under the condition that the FERC complete its environmental review process. I think currently they're about 26 pending applications, about 15 of which have been pending for over a year.

Earlier this month the DOE proposed making changes to the approval process. I'm just wondering how things are coming along with the application process and anything you have in terms to offer regarding the timelines?

Mr. SMITH. Thank you for the question.

One thing we've really endeavored to do as we've gone through this process is to establish a track record for getting the applications evaluated and passed through the previous conditional authorization process. So I think that we've, you know, that we've spoken about the quantity of natural gas that we've already authorized on a conditional basis. We're changing to focusing on the finals.

But our job is to make sure that we get to that queue in a way that's responsible. That makes good and important public interest determinations, but gives the market some certainty that we're able to actually make those decisions in a way that is fairly predictable.

I think for the seven conditional authorizations that we've issued we've established a record of being able to evaluate those and put out the reasoning in orders that are in clear, plain English that state very clearly the rationale that we've used in order to get to the final decisions such as the part of the order that you just quoted a moment ago, Senator.

Senator BARRASSO. Thank you.

Thank you, Madame Chairman.

The CHAIR. Thank you.

Senator Udall.

Senator UDALL. Thank you, Madame Chair.

Mr. Smith, let me follow up with you on the question of how quickly the DOE has acted or could act.

As I think you know, I introduced a piece of legislation yesterday that I mentioned earlier along with the Chairwoman. It would require the DOE to make a decision within 45 days.

How long would DOE need to make that decision?

Mr. SMITH. Thank you for the question, Senator.

So DOE, obviously, will comply with the letter and spirit of the law as written.

Senator UDALL. So if we tell you to use 45 days you would be able to comply with a 45 day requirement?

Mr. SMITH. Again, Senator, I'm confident that whatever the law requires that the Department will be able to accomplish.

Senator UDALL. Thank you.

I serve on the Armed Services and the Intelligence Committees and I have a deep appreciation for the national security implications of natural gas exports. On Monday, Russia announced that it will suspend its natural gas deliveries to Ukraine. We've seen that movie before. It wasn't the first time Russia has held its natural gas supply over Ukraine's head.

A criticism of exports has been that approving U.S. exports today won't have an effect for years to come.

Mr. McNally, in your testimony you mentioned how the prospect of LNG exports are already boosting Japan's bargaining position. Could you explain the connection a little bit more and what about places obviously beyond Japan?

Mr. MCNALLY. Yes, Senator Udall.

I was in Japan on a business trip back in March speaking with officials there. While the—their negotiations with their LNG suppliers are secret they said the smiles have never been wider. Their backs have never been straighter in negotiating these long term LNG contracts because of the gas they contracted to get from the U.S., but will not receive for several years. So it has vastly improved Japan's bargaining position.

Last month Russia cut a deal with Eni, the Italian Energy company, and had to severely weaken. We don't know all the details, but from the press reports it's clear that the Italians got a great deal. They got a lower price and they weakened that Russian control over the gas price.

Mr. Putin recently ran to China and signed a deal that's pretty favorable for the Chinese.

So I think it's fair to say, sir, that pardon me, we've already, sort of, gotten in the head of the Russians. What we're getting ready to do has materially impacted how Russia is contracting right as we speak and will affect their revenues, if not the actual volume of their exports.

Ms. ROSENBERG. Senator, excuse me. Can I add to that?

Senator UDALL. Sure, sure. Ms. Rosenberg, go ahead.

Ms. ROSENBERG. So I would just add to the argument that when people offer that LNG exports from the United States can do nothing to help Ukraine today. That doesn't mean that we should do nothing to help them, Europe and others in the future.

So we have understood and as the national gas production in the United States has increased it has sent cargoes that might have been destined for this market elsewhere, including to Europe, which has given certain consumers the ability to negotiate harder with Gazprom and to achieve lower prices. Lithuania, for example, indicated that in contract negotiations in May they were able to get a lower price for their gas from Russia.

So as Mr. McNally has said, this is already having an effect now even without the United States sending LNG abroad and being able to lower certain prices for certain of our allies abroad in Europe and in Northeast Asia and more U.S. LNG on the market will only increase their ability to do that.

Senator UDALL. We certainly have a stake in the Baltic countries.

I want to make sure Mr. Weiss and Mr. Durbin also can comment.

Mr. WEISS. Thank you, Senator.

I'd like to submit for the record information that actually Europe is paying a higher price from Gazprom now than they did several years ago.

Mr. WEISS. In fact one of the highest prices ever which is $485 per thousand cubic meters of gas and so, all of this new supply has not really seemed to have affected that.

Second, the challenge for helping Ukraine is even if we have all the export terminals that everybody wants there's no guarantee that gas will be sold to either Ukraine or Europe. Of the ones that have been approved by DOE so far only one, the Sabine project, is going to beselling gas to Europe, to Spain and France and the UK, all the rest of the gas and part of Sabine's is going to Asia. So unless we're going to have a law that forces exports to go to Europe than as long as the market price for natural LNG is much higher in Asia than it is in Europe, that's where the gas is going to go.

Senator UDALL. Mr. Durbin.

Mr. DURBIN. Fortunately Senator, the market works. No matter where the gas is going to go from here it is going to help moderate prices globally. So it will help Ukraine even if the gas is going to Asia.

Even today just the fact that we are not importing natural gas, as Ms. Rosenberg was saying, has already had an impact, you know, across the globe on LNG prices. for us to then—to now get into the game and to send these clear signals both to customers and to othercountries that we are committed to doing this. It is going to have that positive impact for our allies and customers around the world.

Senator UDALL. These are all important points of view. I will study them further.

I did want to add in on this note. We've imposed sanctions on countries in the past. The most notably on Iran and markets almost immediately act. To me, natural gas exports would be a form of a positive sanction that has real benefits to our economy.

But again, thanks to the panel. This is a very, very important discussion.

Thank you, Madame Chair.

The CHAIR. Thank you very much.

Senator Hoeven.

Then we'll go to Senator Baldwin.

Senator HOEVEN. Thank you, Madame Chairman.

Starting with you, Mr. Smith, I'd ask each of the panelists. What is the most productive way we can help the European Union and Ukraine with LNG?

I understand, you know, you can't do it, you know, tomorrow. It's going to take some time and I also understand some of your points about it's a global market. But if you were charged with trying to help Ukraine today, in terms of natural gas, what steps do you feel we couldtake that would be helpful?

Mr. SMITH. Well, thank you for the question, Senator.

So I'd perhaps endeavor to refrain that slightly to say what can we do to help our allies and trading partners in Europe with energy security?

Senator HOEVEN. Right.

Mr. SMITH. What they think is the important goal?

So there's, you know, LNG is one component. I'll note that, you know, as someone, who in the private sector worked building LNG import terminals in the U.S. which are now being turned into LNG export terminals. The observation is that as soon as the United States had options other than importing LNG it immediately stopped thinking about importing LNG.

So importing LNG is not a particularly good tool for long term energy security.

In Europe—and we're not in a position to run and tell Europeans how to develop their own domestic resources. But certainly we've learned a lot here from Texas to North Dakota to Alaska about how we develop natural resources including unconventionals. I think there are lessons that we can share here about creating a market and regulatory environment and sharing technological understanding that helps those markets to be developed, gas to be developed and produced domestically, infrastructure to be put in place and the way that we think about some of these issues here in the U.S.

So there's lots of learnings that we've accumulated here that we could share with our allies and other trading partners.

Senator HOEVEN. But let me add this helmet. Right now we flare about $1.5 million a day in natural gas in North Dakota, in North Dakota. We drill oil wells and we get natural gas, LNG rich gas, as a byproduct.

So we're trying to catch up with that. But the price is so low for natural gas in North Dakota that it, you know, obviously it's a problem in terms of getting people to capture this and getting it to market. So I'm trying to put the two together. How do we, being mindful of the impact on other industry?

So I'm looking for, really, brilliant recommendations from all of you on how we put all this together so we're capturing this gas, doing it in a good, economically viableway. Being cognizant of our other industries which I know Senator Stabenow is going to talk to all of you about and helping the E with more energy security.

How do we do this in the most intelligent, most expeditious way? Best ideas? Right down the line.

Yes, Mr. Weiss, if you have a good idea, start it off.

Mr. WEISS. Yes. Thank you, Mr. Hoeven.

First, just for the record I am the grandchild of Ukrainian immigrants to the U.S. on my mother's side. So I have a great deal of concern about that.

I think the fastest, cheapest thing that we can do is to help them become much more efficient. It's the second, least energy efficient economy in the world. We've alreadyinvested $15 million there through USAID. It helped them save $180 million worth of natural gas and it helped them save as much natural gas to heat about 200 thousand U.S. homes.

When Vice President Biden went there back in April he promised more of that assistance. We could do even more still that would help create jobs there. It would help create jobs here if they use American technology like transformers and stuff from Honeywell and other Americancompanies. Ship over there. Make their economy much more energy efficient.

It would really be the first—we could do it right now. It would have impact this year.

Mr. MCNALLY. Senator Hoeven, I would want to aim right at Russia's pocketbook. I think you—the best thing to do would be, as I said in my testimony, to deem all LNG exports to be in the public interest, to send a signal to Russia that we are going to compete.

Let me just quote from a testimony from March from Dr. Montgomery and what that would mean. He said, "We estimate." This is from the NERA, the author of the NERA study, the consulting group. "We estimate that in the next 5 years U.S. competition could drive Russia'srevenues from natural gas exports down by as much as 30 percent and in the long term cut those revenues by as much as 60 percent."

Russia has the largest gas reserves in the world. They will always be sending volume up. But we can hit them in the pocketbook. That's how we can help, sir.

Senator HOEVEN. Compelling point.

Sir?

Mr. DURBIN. Senator, I would say, first it's not an either or, the question here. I think helping them with energy efficiency is a great idea.

Senator HOEVEN. I agree both of those are good ideas.

Mr. DURBIN. Yes, but I think that, you know, also being very clear that, you know, we are going to be entering this game on global LNG exports does get to the pocketbook issues of Russia, but also just helps allies around the world.

To your point I think also, you know, North Dakota is, the State, is leading along with the industry on being able to capture those resources. It just means we're goingto continue to have more resource available for manufacturers and for, you know, for customers and demand here in the U.S. and abroad.

Ms. ROSENBERG. So for all we can do, we won't change the fact that Russia will be a very significant supplier of natural gas to Europe. But the things that we can do thatwill be effective include, of course, first and foremost efficiency. I certainly agree with my panelists on that, fellow panelists.

Additionally, indigenous production and one of the best ways to do that there is to help create, through technical assistance and other means, the right regulatory, taxation and investment terms in order to help bring in that indigenous production and give investors confidence that they can, in fact, run a successful project there and make a return.

Of course, encouraging the changes and reform in market and pricing for gas and power in Europe is also an important contribution we can help with there.

Exporting LNG which as Mr. McNally said, will help to diversify the European market and give those consumers the opportunity to negotiate for lower prices from Gazprom.

Senator HOEVEN. Thank you. Appreciate it.

The CHAIR. Senator Baldwin.

Senator BALDWIN. Thank you, Chair Landrieu and Ranking Member Murkowski. I'm really glad that we're having this discussion today. I have a few comments as well as a few questions for our panel. I'll try to get them in my time here.

I'm particularly pleased we're having this discussion today because of the way in which natural gas is a key input that drives manufacturing. I hail from a State that has a very vital and vibrant manufacturing sector. Our policies on natural gas exports, transport and use have a tremendous impact on consumers. Some of the witnesses here today have touched briefly on the issues affecting consumers in your testimony.

But I remain convinced that discussions around how we will use our natural gas resources must fundamentally protect American consumers and provide them with a seat at the table. Therefore, Madame Chair, I would like to ask unanimous consent that testimony that has been prepared by the Industrial Energy Consumers of America which addresses, particularly, the impact on consumers be placed in the hearing record. I have a copy available for you.

The CHAIR. Without objection.

Senator BALDWIN. Great, thank you.

Senator BALDWIN. Between 2010 and 2013 about 60 thousand jobs were created in the oil and gas industry in the United States. In that same period as natural gas prices dropped from $8 to $9 per thousand cubic feet down to a low of about four in 2012, the manufacturing sector added about 570 thousand jobs.

Manufacturers tell me regularly and I think they'll tell you that in large part it's low energy prices that are driving another great American renaissance. We've seen plants return to our shores. We've seen shifts added. We've seen growth in this core sector of our economy.

The Chair earlier referenced the Charles River and Associates study of last year comparing the economic contributions of exporting a unit of LNG verses using that same unit in domestic manufacturing. It found that using that unit here in the U.S. contributed $5 to the economy compared to $2.40 when it was exported. When it compared the jobs sustained domestic use of natural gas contributed about 180 thousand jobs compared to 22 thousand when the gas was exported.

So I'm very concerned about the impacts of exports on domestic prices because of the critical role that these low prices are playing right now in our manufacturing economy. So I'd like to open up a couple of questions to the panel. I was listening, Mr. McNally, when you were talking about the other major exporters of LNG. Talking about how liquefacation costs will always mean we have a low domestic price.

But what comments would you have about the experience in Australia? Now my understanding is—and they've been exporting for a while. But the domestic prices have tripled there. They're projecting even greater, you know, greater increases in prices.

What does that tell us about what the sweet spot that we're all discussing here in the U.S. might be?

Mr. MCNALLY. Thank you, Senator Baldwin.

I am not an expert in the Australian natural gas or manufacturing sector. But my understanding, generally, is —and I'd be happy to do a little work and get back to you. I'd be happy to do that.

Mr. MCNALLY. My understanding though is the Australian resources are much higher cost than ours are. They're remote.

They're offshore. Australia doesn't have the infrastructure that we have to get it to where it needs to be consumed.

So just the cost of producing gas in Australia is an order of magnitude or more than ours and I think that——

Senator BALDWIN. Yet, but how then, if they're increasing their exports that would obviously be tightening the already expensive, domestic supply. We're trying to figure out where this sweet spot is, I guess, as everyone is calling it, a range of BTUs for export verses domestic use and the price range.

Mr. MCNALLY. The—my understanding, again, and I want to check the data is that Australia's exports are about 40 percent of their consumption. Whereas most studies I've seen with regard to the U.S., I think it's most likely that we'll end up permitting 6 or 7 or alittle bit more BCF a day, so 10 percent or less. So the volume, the amount of exports in the economy may be a factor. But again, I'm not an expert on the Australian experience.

Senator BALDWIN. OK.

You know, we've certainly—Mr. Weiss?

Mr. WEISS. Thank you.

The NERA study that the Chair has referenced and Mr. McNally just referenced, said basically and I quote. Higher natural gas prices in 2015 can also be expected to have negative effects on output and employment, particularly in sectors that make intensive use of naturalgas. The manufacturing sector is dependent on natural gas a fuel and are therefore vulnerable to natural gas price increases."

So our concern is that we may be doing this to make our—some of our allies more energy secure, but we'll be weakening our own economy at home. We need to know how big that impact is going to be before we go ahead and approve even more export applications that we alreadyhave approved.

Senator BALDWIN. Madame Chair, I have run out of time, but I did have a couple of questions for Mr. Smith relating to the updates in process and updated analysis. Might I submit them for the record or I could?

The CHAIR. Absolutely. We're going to go through a second round if you can wait.

Senator BALDWIN. Oh, then that would be perfect. Then I can wait.

The CHAIR. OK.

Mr. DURBIN. Senator, I do have a paper on Australia. I'll be happy to provide.

Senator BALDWIN. Thank you, appreciate it, Mr. Durbin.

The CHAIR. Senator Stabenow.

Senator STABENOW. Thank you. Thank you very much, Madame Chair and Ranking Member. Thank you to all of you. This is a very, very important discussion.

I want to start, Mr. Smith, by saying thank you to you and the Secretary for, I believe, putting forward a proposal that really is the sweet spot at this point. To prioritize for review the projects that are serious enough to have spent millions of dollars in order to conduct a national environmental policy act review.

Then second, to update your study which I think is critically important to do in terms of the impact on American jobs and Amer-

ican manufacturing, American consumers. So I want to thank you for that.

Also, just for the record, lots of different numbers going around and certainly FERC has approved 2 projects. As I understand it there's, first of all, FTA applications, Free Trade Agreement applications are automatically approved. Most of those are not ones, I guess, that folks are willing to pursue but have been approved 39.31 BCF.

But the big area we're focused on is seven projects. Isn't it true, Mr. Smith, that 2 of those have now gone on to be approved finally by FERC? But in total the DOE has given preliminary approval to move forward on 10.9 BCF. Is that correct?

Mr. SMITH. Thank you for the question, Senator. So the total of conditional authorizations that we've issued has been 9.27 billion cubic feet per day. Then we've issued a final authorization for one terminal which is the Sabine Pass terminal in Louisiana for 2.2 billion cubic feet per day.

Senator STABENOW. I see.

So that would be 11? What you're saying 9? What was it again?

Mr. SMITH. 9.27 on a conditional basis and then of that 9.27, 2.2 has gone on to be authorized on a final basis.

Senator STABENOW. OK. Great, great. Thank you very much.

So let's look for a second though on what we're talking about just in terms of the study the DOE already did. You said that a high export scenario was 12 billion. So you've done over 9. Twelve billion cubic feet per day and that at 12 billion we could see up to a 54 percent increase in energy costs, translating into $60 billion a year in higher energy costs for American consumers and businesses as well as concerns that Mr. Weiss was talking about in terms of what happens to wages and labor costs and so on.

As we go forward and we're talking about all of this I guess I appreciate the window of opportunity internally. I appreciate hearing all about the economies around the world. I'm going to talk about ours.

We've got ten million people out of work in our country. When we look at the incredible advantage we have right now of this great new boon in natural gas.

The fact that China is paying $14 per million BTUs right now.

Brazil is paying $15.

Europe is about $8.

In America we're paying about $4.

Now if that was a tax rate differential we would never give that up in a million years. Never. So here we are debating and I appreciate very much the impacts. I care about around the world.

But I also care deeply about right here, in America. So from our standpoint this is a huge competitive advantage. Businesses are coming back to America.

We've seen BASF moving production from Europe back to facilities here in America and in Louisiana. They've invested $6 billion in America in recent years.

More than 100 productionsites around the country.

There are many more opportunities to talk about, more than $100 billion investments in other manufacturers.

One hundred and Fourty-eight different manufacturing projects.

In fact the Charles River Associates have said that if we focus on exports verses manufacturing there's 8 times more jobs in manufacturing because there's so many products that we use natural gas in. So, I guess I'm not going to ask a question because I just, at thispoint, Madame Chair, I love the fact that we've added 646 thousand jobs since February 2010 in manufacturing.

It's the fastest pace of job growth since the 1990s. I want to keep it up. I'm willing to work on finding, based on the DOD study, how we can make sure what you've already approved gets online.

But for the life of me, I cannot imagine why any American listening to this debate, unless you own an oil and gas company, would think it's a great idea to give up a huge advantage right now that we have in cost that is creating good paying, middle class jobs.

Thank you.

The CHAIR. Thank you.

Let me follow up with a line of questioning. Maybe Mr. McNally and Mr. Durbin, you could best respond to the comments made by Senator Stabenow and her passion for creating jobs in America is, you know, is terrific. I'd also say that that's my purpose too, is to create more jobs here.

That's the whole purpose of this hearing and having a balance of using domestic gas internally for our own use and export is the best way to create the most jobs inAmerica. That's—we agree on that. This is about creating jobs in America.

So talk about the economic advantage that seems to be of such concern to this Senator and to others. Explain again, how we will always maintain or for the foreseeable future should maintain a significant economic advantage. I think you testified to that, if you wanted just to repeat or add something to that.

Mr. MCNALLY. Thank you, Madame Chair.

Certainly agree that were we to confront a choice between a manufacturing renaissance and exports we all know what we would choose. That would be our manufacturing.

The good news and this news comes from study after study from NERA and Brookings, that you, Madame Chair, mentioned and others, is that we can have our gas and export it too. There is so much gas in this country now. The gas curve is so flat meaning that were the pricejust to go up a little bit a lot more supply comes out of the ground.

There's so much gas here that as the NERA study found, our net welfare as a Nation goes up even if we had unlimited exports of LNG in terms of public policy limits.So we just allowed the market to decide how many export facilities will get built. So, again, I would just want to remind about all the studies that we've talked about today that show we have enough gas to have both those things. There's really no reason to have to make thatchoice, that awful choice that you mentioned.

The CHAIR. I think that's an excellent point.

Mr. Durbin, since you represent both producers of gas, E and P, exploration and production, and users of gas, both for electricity as well as for fuels. Your organizationrepresents all of that, correct?

Mr. DURBIN. Actually we are just the producers.

The CHAIR. OK, just the producers.

OK.

Mr. DURBIN. But I——

The CHAIR. Among your general producers of that are producing for various, different means, how do they reconcile this tension between using gas for electricity, using gas for fuels, using gas for other things and some of the concern that we might run out of a supply that Mr. McNally says, really looks almost limitless right now.

Mr. DURBIN. Thank you for the question, Senator.

Let me first say that, you know, I and our member companies share the Senator's passion with regard to, you know, helping to shore up our own economy here first. We think that, you know, U.S. energy production is doing that, has done that and will continue to do so.

The mission that my members gave me was to promote the increased demand for and use of natural gas. That's in power generation, in manufacturing, in transportation and in exports. The point being and may again, again, you know, the resource is just so enormous at this point. Our ability to get it at affordable prices continues to improve on a daily basis.

Again, in my testimony you'll find another, to Mr. McNally's point, that, you know, ICF has done a study that shows that, you know, as far as, you know, flattening out the supply curve, you know, for natural gas. There's now, by their estimates we have 1,500, trillion cubic feet of natural gas available at sub $5 levels. That means we can have our gas and export it too and continue to drive growth in our economy and the manufacturing.

The CHAIR. Thank you.

Let me ask you, Mr. Smith. In 1992 which is the law that we're reviewing, the Congress said that LNG exports shall be deemed automatically to be in the public interest if they involve transactions between the U.S. and free trade agreement countries. So the following countries which we all know, Australia, Bahrain, Canada, Chile, Columbia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Israel, Jordan, Korea, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, and Singapore. There's nothing for you to decide because the Congress has already decided this is in our interest, correct?

Mr. SMITH. That's correct. Those——

The CHAIR. That is correct because the law directs you in that direction.

Mr. SMITH. That is correct.

The CHAIR. OK.

This committee is going to consider what the update to that law should be and what is in the U.S. interest to export. That, I think, will be based on an economic analysis of having our gas and exporting it too and what those numbers are.

The only other decision you would make is whether the receiver was meritorious of receiving. It's, you know, the question is how much can we afford to export? It's a veryimportant question that I want this committee to try to grapple with.

The other question could be and this is what I want to ask you is the merit, the friendliness of the country in receipt. So has that ever been a discussion that you'reaware of in another committee which is out of our jurisdiction that would be in foreign relations,

you know, who we should or shouldn't export. I mean, clearly inWorld War II we wouldn't export to Germany, our enemy.

So along those lines have you been engaged in any discussion about that in another committee?

Mr. SMITH. I have not personally been engaged with that.

The CHAIR. Do you know if the Secretary of Energy has been asked to testify along those lines?

Mr. SMITH. Along that particular question I can't answer about that.

The CHAIR. So it really has been just, to your knowledge, about the volume, the question of the volume.

Mr. SMITH. The volume along with all the other issues that we considered today.

The CHAIR. What are all the other issues?

Mr. SMITH. In terms of public interest?

The CHAIR. Yes.

Mr. SMITH. In public interest we look a wide variety of issues.

The CHAIR. Like what exactly?

Mr. SMITH. We look at impact on prices.

We look at impact on manufacturers.

We look at impact on consumers.

We look at job creation.

The CHAIR. But you don't look at that for these because the Congress has already deemed automatically that it's in the public interest, for these countries.

Mr. SMITH. Yes, Senator. That's correct. For those countries we have——

The CHAIR. Yes.

So what some of us are thinking about doing is just adding to this list because it's clearly, according to the law, in our interest to export to these countries.

The only real question to me is, how much should we be allowing to leave our country that provides us with the balance that we need to create jobs here at home more and more and more. Capture gas that is being flared into the atmosphere which is not good and put it into the market so everybody can make money on it.

I just think we should be pretty clear about that. If there are members that disagree, I'm happy to hear that.

I'm going to—I've gone over my questions. So I'm going to stop.

But the law says it is in the public interest to export to these counties. The question is how many other countries should be added, in my view? Should it be NATO countries that we fight battles with over this issue of resources? Should it be the 170, you know, tradeorganization members that we trade all sorts of products with? That's one question.

Then the other question is what volume should we allow and what triggers should regulate that, is the way I'm thinking. But let me turn it over to Senator Murkowski.

Senator MURKOWSKI. Thank you, Madame Chairman. This has been a good hearing, good information put out on the table.

I just want to get a couple of things clarified with you, Mr. Smith, just so I make sure that I have heard and interpreted correctly.

When we're talking about this procedural change here one of the concerns that I have is the uncertainty surrounding what happens to projects that are awaiting these conditional licenses within this interim period before the change is finalized. We've heard from some thatthese conditional approvals send good, positive signals to the market. I happen to believe that that is the case. The Administration has, in fact, argued that as well.

So what I would like to know, specifically from you, is whether or not these conditional approvals will continue as you're collecting comments and figuring out what you're doing going forward. You're not, in other words, you're not going to be stopping or slowing down on theseconditional approvals?

Mr. SMITH. Thank you, Senator, for that question.

So two points I'll make in response to that question.

First, we have—we plan on continuing to finalize the conditional approval that we've already started working on the one that's next in the queue. So we expect to continue with that authorization.

We don't expect to——

Senator MURKOWSKI. Wait. Will you continue with just the next one in the queue and the one subsequent to that or just the one?

Mr. SMITH. On a conditional basis we expect to continue with the one conditional authorization that we've already started on. We also expect to continue to move forward with final authorizations for those applicants who have received conditional authorizations and who complete the FERC process. So those would be applicants who would be eligible for final authorization.

They would not be—we would consider—we would continue with those authorizations.

Senator MURKOWSKI. OK. So those will continue as well as the one that is immediate in the queue now?

Mr. SMITH. Immediate in the queue for conditional authorization.

Senator MURKOWSKI. OK.

Then another clarification here.

It's been stated this procedural change effectively resets the clock on these cumulative volumes so that only the finally approved projects count toward the 12 billion cubic feet per day. So, right now we've got the 2.2 billion cubic feet per day for Cheniere and then thisSempra one that has just been approved.

So this means that no matter how long it may take to do this additional study, assessing the cap up to 20 billion cubic feet, you will continue to process those applications that take you up to the $12 billion, excuse me, the $12 billion, BCF?

Mr. SMITH. BCF.

That is correct. So with—we've approved the 2.2 BCF per day. As final authorizations there is an additional authorization or application that's gotten through the FERC process for an additional 1.7 BCF. So that takes us up to a total of 3.9 BCF per day.

Senator MURKOWSKI. Right.

Mr. SMITH. We've done a study that goes up to 12 BCF. We've announced that in the future we'll be looking from 12 to 20. But right now we're at—you're at 2.2.

Senator MURKOWSKI. Right.

Mr. SMITH. Another thing I'd observe is——

Senator MURKOWSKI. But—can I just ask then on that?

We're at the 2.2 but will you continue moving toward final approval even while this study is underway that does this assessment between 12 and 20?

Mr. SMITH. So the study for 12 to 20 would only impact those applications that are beyond 12 BCF. So yes, we do not have to complete that additional economic study for us to move forward on final applications.

Senator MURKOWSKI. OK.

I just want to make sure that we're still moving here. Then one final point of clarification here.

I am expecting, I'm certainly hoping that by the end of this year we will see more projects than that will receive final approval from DOE after completing the review at FERC. That's my hope. That's—and I'm hearing you, kind of, lay out this process. I'd like a little bit of optimism or assurance that you would agree that we will see final approval.

Would you be surprised if we did not?

Mr. SMITH. I think that's a reasonable expectation, Senator. The comment period for the two studies that we've put out, that closes on July 21st. That will give the public 45 days to comment on the upstream study and on the greenhouse gas emissions study which will be considered in reference in our next final application.

So we need time to see what those comments are that we get. We have to evaluate them. We haven't gotten the comments yet. So I don't know what they are.

But it's our general expectation that we should be able to finish with that process and finish with the comment period for the change in process in a timeline that's roughly consistent with the next applicant coming out of the FERC process and finishing with the notice for rehearing and all things that has to do with FERC.

So we don't expect this process to be, you know, a delay in our ability to continue to process final applications.

Senator MURKOWSKI. Good. That's good to hear because there's a lot, seemingly, a lot of moving parts. Quite honestly when additional studies are announced around hereit's usually code for, OK, we're going to slow things down. Now we have a reason to back off of it.

Mr. SMITH. Right.

Senator MURKOWSKI. But you seem somewhat assured that we will continue that process while these studies are in play. I would certainly hope that that would be the direction as we move forward.

Mr. SMITH. I——

Senator MURKOWSKI. There's a lot of skepticism out there.

Mr. SMITH. Thanks, Senator, but I would observe that the 2 studies that we've talked about the greenhouse emissions study and the upstream impact study. Those studies are—have been published. They're available. They're on our website. You can download them. You can read them. They're out for public comment right now.

The public comment period will close on the 21st of July. So there's a set date for that public comment period closing.

I don't know what comments we're going to get so I can't give a commitment on exactly how many days that we're going to need in order to evaluate the comments. But what we can commit to is

that the—our expectation is that we should be able to open and close the comment period,evaluate the comments and be ready to move forward on subsequent applications at a timeline that's roughly consistent with the next applicant being completely finished with the FERC process.

Senator MURKOWSKI. So it would be good to get updates as you go along so we can just kind of make sure we're all going in the same direction?

DOE has no basis to estimate how long it will take to evaluate comments on these two environmental reports. The time it takes to evaluate these comments will depend on a number of factors, including the number of comments and the scope of the comments received.

Mr. SMITH. I'd be happy to do that.

Senator MURKOWSKI. Thank you.

The CHAIR. Thank you. Our hearing is coming to a close with the next set of questions by Senator Baldwin. Then we'll have a wrapping up remarks. I think that will call it a day.

Senator BALDWIN. Thank you. I appreciate second round and a chance to continue with a few questions.

Mr. Smith, on the topic that we were talking about the changes in the process for permitting, recognizing, obviously, a huge change in the landscape for natural gas in our country. I was particularly pleased to see that the Department is seeking updates in their analysis of the impacts of natural gas exports on the public interest.

What, I guess, I'm curious about is, sort of, the granularity of that analysis that we might expect because we know that exports will have different impacts in different regions of the country and different States and different sectors. I was talking in the last round alittle bit about my State of Wisconsin and its manufacturing economy.

So, I guess my first question is will you really be looking at, sort of, broad, national averages or will you get into a greater level of geographic and sector granularity in your update?

Mr. SMITH. Thank you for the question.

We do expect to have, you know, a certain level of granularity certainly in the last study that we commissioned that was done by NERA. We took a close look at sectors. We looked at different sectors of the economy and impacts on various areas.

So we would expect to do something similar in this study so that we get a look at what this means for consumers throughout the United States, but also for manufacturing consumers.

Senator BALDWIN. So economic sectors also, regions and States?

Mr. SMITH. I—we have not scoped this study thoroughly yet. But I would expect.

Senator BALDWIN. Then I would encourage you to get that level of specificity. I know that, certainly, you know, there's quite a variation between how increased exports, at least that's my instinct on all of this.

Mr. Weiss.

Mr. WEISS. According to DOE guidelines the impact on the economy and wages and those sorts of things are a secondary consideration. The primary consideration is the impact exports will have on

domestic supply and U.S. energy security. So the things that you've been raising are important, but as far as the rules go, they're not as important as those other considerations.

Senator BALDWIN. But let me go a little bit further with Mr. Smith on this.

I would—as you're scoping this study I would also encourage you to look at likely significant changes in domestic demand by virtue of things like boiler MACT and other, you know, EPA greenhouse gas rules. In a State like my own where 62 percent of the electrical generation right now is coal and States, of course, are going to have a significant mandate to figure out plans to reduce that greenhouse gas emission level as boiler MACT is, you know,in its stages.

We're going to see some demand, domestic demand, changes. So I hope we anticipate those as we look at updating the analysis on export impact?

Mr. SMITH. Indeed, Senator. That's really the driver toward doing additional studies. We're aware that things change. Markets change. The rules in some cases change.

So as we look at going from zero exports to larger numbers, it's appropriate periodically to make sure we're making decisions based on recent and appropriate data. So capturing some of these things is the very reason.

Senator BALDWIN. Yes.

Mr. SMITH. That we do this.

Senator BALDWIN. I would just certainly strongly recommend that you look at both of those sets of issues, not only regional and sector issues, but I suspect in a State like my own we are going to see some significant fuel switches. I certainly want to make sure that that's affordable. As Senator Stabenow was saying, that we actually even retain a cutting—a real advantage in doing these things.

Thank you.

The CHAIR. Thank you, Senator, for those excellent questions.

Just a couple of wrapping up remarks.

I've asked the staff to submit a record to the committee about the States that produce natural gas and also are huge consumers of natural gas because getting to Senator Baldwin's question, I think it's important as we move forward to make decisions about this. We have to be clear about what regions of the country are producers and consumers.

The CHAIR. Interestingly as I've stated to the members of this committee, Louisiana is a little bit in both. We produce a tremendous amount of gas, but we also consume a tremendous amount of gas. So we're, kind of, a good balance here. It's not in our interest for just, you know, unlimited exports, neither is it our interest to not export because we both produce it and consume it.

So in order for our economy to work we've got to have that right balance. I, kind of, think that is going to be where we end up in the country. So, but let's get that information about what States are consuming? What States are producing? I'll ask the staff.

Then finally for Mr. Weiss, I think one question about this life cycle greenhouse gas needs to be answered. You stated in your testimony that there's little differencein the life cycle emissions be-

tween using U.S. LNG exports or coal for power production in Europe and Asia. That's what your testimony says.

Yet our own labs, our own energy technology laboratory, the latest analysis of LNG life cycle emissions estimates that our exporting from the U.S. on average would reduce greenhouse gas emissions by almost 40 percent in Asia and 42 percent in Europe over 100 years if thesubstitute, if it's a substitute for coal which is in large measure, all that—not all that Europe has but they rely a lot on it. They're closing their nuclear facilities downin some of those countries. They don't have the technology that we have.

So they do rely heavily on coal. So while acknowledging an uncertainty range around these estimates it concludes it would reduce greenhouse gases from a minimum of 18 percent and as high as 61 percent.

Are you saying in your testimony that that difference is not accurate?

Mr. WEISS. Madame Chair, that same study.

The CHAIR. Are you disputing that?

Go ahead.

Mr. WEISS. No. I'm not disputing it.

But that same study says, "The use of U.S. LNG exports for power production in European and Asian markets will not increase GHG emissions on a life cycle perspective when compared to regional coal extraction consumption for power production."

That's the same study. Basically what they found is although natural gas is 50 percent cleaner when it comes to carbon pollution than coal, that all of the carbon pollution and energy that's used to liquefy the gas, to ship the gas, liquefy it, move it across the ocean, then un-liquefy it, takes up—is 50 percent more energy intensive than the coal supply chain.

So basically I'm reading it—the way—and again I'm quoting the exact same study you are that the way I read this is that there's basically no difference. That's what this study concludes. There's no difference because of the supply chain emissions from LNG exports,between LNG exports and foreign coal.

The CHAIR. Has the Department of Energy made a conclusion on this? If so what is it? If not, when will you have it?

Mr. SMITH. So the statement that Mr. Weiss read is one of the conclusions of the study which essentially that it's argumentation that LNG exports don't increase greenhouse gas emissions.

The CHAIR. They do not.

Mr. SMITH. They do not.

The CHAIR. But the question is do they reduce it?

Mr. SMITH. If you look at the study there's lots of scenarios. In the vast majority of the scenarios, excuse me, emissions actually do go down.

The CHAIR. That they do reduce greenhouse gases even given what Mr. Weiss said about the, you know, fabrication transport, etcetera. Even taking all that into consideration it actually reduces greenhouse gases? That's what you're testifying to?

Mr. SMITH. That's the conclusion of the study which is also out for public comment. So a very important part of this process is to put the data out. Do it in a way that's flat and open and clear. Then allow the public to comment on the study and the analysis.

So that's a key and critical part of us making good public interest determinations is to make the data available.

The CHAIR. I agree with you. I think people are going to be very interested in what the findings are whether it reduces, you know, greenhouse gases or increases. Very interesting. We should have that analysis done shortly.

I'd like to give you all each a chance to wrap up in 30 seconds starting with you, Ms. Rosenberg. Anything that you think should be on the record that you did not put on the record, any closing remarks.

Ms. ROSENBERG. I think I have nothing further to add than what I did earlier and in being mindful of your time I think I'll pass it on.

The CHAIR. Thank you.

Mr. Durbin.

Mr. DURBIN. I do think it's been a very comprehensive hearing. Thank you for holding it. Angain, just believe that, you know, we do have the resource here and be able to produce it at affordable prices for quite a long time.

The CHAIR. Thank you.

Mr. Weiss.

Mr. WEISS. Thank you for having me, Madame Chair. I would just like to add the NERA study that Mr. McNally and others have quoted makes it very clear that natural gas exports are a net economic benefit to the country. But essentially there's a transfer of income between those who work in manufacturing and work in labor intensive jobs to those who are in the oil producing sector.

Oil producers are much better off. Wages are lower and less manufacturing.

Thank you for having me.

The CHAIR. Mr. McNally.

Mr. MCNALLY. Thank you for having me, Madame Chair. I have nothing to add.

The CHAIR. Mr. Smith.

Mr. SMITH. Thank you very much, Chair Landrieu.

I guess just in closing I'd say that, emphasize that the process change that we propose is all about making better decisions about improving the process, about making sure that we make good informed decisions and that we include all of the broad public stakeholders that we'veheard from, you know, here in this hearing as part of that process.

So we're committed to an open and transparent public process that's as efficient as possible, but helps us make sure that we balance these issues and these decadal challenges that we're facing before us.

The CHAIR. Thank you very much.

The record will stay open for 14 days.

The CHAIR. Thank you all.

The meeting is adjourned.

[Whereupon, at 4:27 p.m. the hearing was adjourned.]

APPENDIXES

APPENDIX I

Responses to Additional Questions

RESPONSES OF ELIZABETH ROSENBERG TO QUESTIONS FROM SENTOR FRANKEN

Question 1. One challenge standing in the way of more natural gas vehicles on the road has to do with refueling infrastructure. Service stations across the country are predominantly designed to dispense gasoline. Infrastructure for natural gas or other fuels is far less common. What are some of the advances that could make home refueling units more cost effective?

Answer. Natural gas vehicles currently represent a small but promising portion of the U.S. transportation fleet. The adoption of natural gas-fuelled vehicles is greatest among heavy-duty vehicles, where the cost advantages are greatest and the size of natural gas fuel equipment is manageable. The light-duty natural gas vehicle sector is in its infancy. Utilities and manufacturers are working to develop new technology and home refueling systems that will match the cost advantages already in evidence in the heavy-duty natural gas vehicle domain. New codes and standards will help to facilitate the growing commercial adoption of light-duty natural gas vehicles and home refueling units. Specific incentives for individual technology production are rarely helpful or effective, but proper market design and clear policy objectives can speed development of effective technology solutions.

Question 2. Natural gas in homes is stored under low pressure, and it takes hours to compress the gas to the Compressed Natural Gas (CNG) form necessary to fill up the tank. What are the prospects of overcoming this hurdle for home-filling units?

Answer. There are a variety of distribution and technology deployment challenges associated with adoption of light-duty natural gas vehicles in the United States. Technology for home refueling is one such challenge and a source of serious research and development focus for commercial and university experts. While this technology is in its infancy, there are great commercial advantages of using relatively inexpensive natural gas and accessing the convenience of in-home natural gas sources. Prospects for overcoming the hurdles associated with in-home natural gas compression are promising while natural gas prices remain relatively low.

Question 3. One of the challenges associated with CNG vehicles is that the large fuel tanks take up a lot of trunk space. This is one area that may be ripe for technological innovation. For example, 3M in Minnesota is working to develop natural gas fuel tanks using composite material that could be much lighter and hold more capacity than currently available tanks. What opportunities exist for breakthrough technologies in this area? What are some of your recommendations for incentivizing the development and deployment of new technologies?

Answer. The commercial incentives for use of natural gas in heavy-duty vehicles are clear and have caused a meaningful adoption of this technology over the recent past. Technology challenges associated with shrinking the size of the fuel tank in a light-duty natural gas vehicle are substantial but not insurmountable. With relatively low natural gas prices, auto manufacturers and natural gas sector entrepreneurs will continue to work to realize a breakthrough for this technology in the light duty vehicle market. Incentives and technology support for the natural gas vehicle market through policy should be crafted with clear objectives, but retain sufficient flexibility to allow markets to shift and respond to changing circumstances.

RESPOPNSES OF CHRISTOPHER SMITH TO QUESTIONS FROM SENATOR FRANKEN

*Question 1.*The Department of Energy (DOE) has conducted several studies on the effect of increased Liquefied Natural Gas (LNG) exports on domestic prices. Under the various scenarios considered in these studies, are there any export scenarios DOE considered where consumers do not pay higher prices for natural gas?

Answer. DOE undertook a two-part study of the cumulative economic impact of LNG exports. The first part of the study was conducted by DOE's Energy Information Administration (EIA) and looked at the potential impact of additional natural gas exports on domestic energy consumption, production, and prices under several export scenarios prescribed by DOE. The EIA study did not evaluate macroeconomic impacts of LNG exports on the U.S. economy. The second part of the study, performed by NERA Economic Consulting, assessed the potential macroeconomic impact of LNG exports using its energy-economy model. NERA built on the EIA study requested by DOE by calibrating the NERA U.S. natural gas supply model to the results of the EIA study. The EIA study was limited to the relationship between export levels and domestic prices without considering whether those quantities of exports could be sold at high enough world prices to support the calculated domestic prices. NERA used its Global Natural Gas Model to estimate expected levels of U.S. LNG exports under several scenarios for global natural gas supply and demand.

In all natural gas export cases evaluated by EIA, domestic natural gas prices were higher than the reference case without natural gas exports.

In many of the NERA cases in which U.S. liquefied natural gas (LNG) exports were allowed to compete internationally, no LNG exports occurred in NERA's model because the delivered price of U.S. produced LNG to international markets was not competitive with LNG delivered from other sources. In those cases, domestic natural gas prices did not rise. In other NERA cases in which international natural gas demand was higher than in NERA's reference case, or if international, non-U.S. supplies of LNG were restrained in different scenarios, U.S. LNG exports were projected to occur and in those cases, prices of domestic natural gas rose.

It is important to note that in all studies, including the EIA's most recent update, the Annual Energy Outlook 2014 (AEO 2014), issued on May 7, natural gas production rose at a higher level than potential exports. Projections from the AEO 2014 reflect that the 2035 Henry Hub price in the AEO 2014 Reference Case is $6.92 per million Btu (MMBtu), down from $7.31 MMBtu in the AEO 2011 Reference Case (both in 2012 dollars), which was the basis for the two-part LNG study.

Question 2 In order to approve LNG exports, DOE is required to consider the public interest. As your testimony indicates, this includes economic impacts, international impacts, security of natural gas supply, and environmental impacts, among other factors. However, economic impacts vary by region. Higher prices for natural gas may benefit states rich in natural gas, but may not benefit states with manufacturers who need to buy natural gas. Does DOE's public interest determination account for varying impacts on different regions of the United States?

Answer. DOE's evaluations contain analysis of regional impacts of LNG exports when those impacts are included in dockets submitted by the applicants, proponents or opponents in DOE proceedings. For example, DOE included a section on Regional Impacts in Jordan Cove Energy Project, L.P., DOE/FE Order No. 3413 (Order Conditionally Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas by Vessel from the Jordan Cove LNG Terminal in Coos Bay, Oregon, to Non-Free Trade Agreement Nations) dated March 24, 2014. The applicant in this case included a study that addressed regional economic benefits that would accrue from a grant of the application. DOE found that the record contains substantial evidence of regional economic benefits from a grant of the application.

Question 3. Fracking demands large amounts of water. We are projected to frack a million new wells by 2035. Each fracking well is estimated to use two to ten million gallons of fresh water per year. In addition, up to 90 percent of water used for fracking can remain unrecovered underground. How is DOE working with industry to make sure more water is recovered, recycled, and also treated for other uses?

Answer. DOE, in collaboration with DOI and EPA, sponsors research and development (R&D) work directed toward mitigating the environmental effects of oil and gas production activities, including hydraulic fracturing. These include finding alternatives to water for hydraulic. fracturing, minimizing the amount of water used in hydraulic fracturing, and reutilizing waters that are recovered from oil and gas wells. Essentially all oil and gas wells, even those in which hydraulic fracturing is not employed, yield large quantities of "produced water" in association with the oil and gas that are their principal products. While only a comparatively small portion of the water used to hydraulic fracture a well may be recovered during the initial "flow-back" phase (which occurs after hydraulic fracturing but before a well is

placed in production), it is not uncommon for the total quantity of produced water that is recovered over the life of a well to exceed the amount that was used in hydraulic fracturing. Recovering, treating, and either properly disposing of or recycling all waters recovered from oil and gas wells is a significant environmental challenge which also represents a substantial cost of doing business to producers.

While numerous water treatment technologies are currently available, DOE, other federal agencies, and the industry are pursuing more cost-effective and less energy-intensive 3 treatment approaches, such as membranes. DOE's primary focus is on promoting the reutilization of produced and flow-back waters in oil and gas production operations. However, to the extent that technological advances facilitate more efficient and effective removal of contaminants, a greater range of recycling possibilities may emerge.

Alternatives to water as a hydraulic fracturing agent include using carbon dioxide or nitrogen. These agents are not effective in all geologic formations, but sometimes can offer an attractive "water-less" alternative. DOE and industry are also actively exploring using water recycled from other industries, such as acid drain water from mining, for use in hydraulic fracturing. Due to the considerable cost of purchasing and transporting millions of gallons of fresh water to production sites, industry has a clear economic incentive to minimize its fresh water requirements.

DOE's interest in water use, treatment and recycling extends beyond the oil and gas industry. The water-energy nexus is integral to two DOE policy priorities: climate change and energy security. DOE's program offices have addressed the water-energy nexus for many years; however, this work has historically been organized on a program-by-program basis, where water has been considered among a number of other factors. In the fall of 2012, DOE initiated a department-wide Water-Energy Tech Team (WETT) to increase cohesion among DOE programs and strengthen outreach to other agencies and key external stakeholders in the water and energy sectors. The WETT developed the Water-Energy Nexus: Challenges and Opportunities report, which was released in June 2014, to provide 4 an analytical basis from which to address these objectives and to provide direction for next steps.

RESPONSES OF DAN WEISS TO QUESTIONS FROM SENATOR FRANKEN

Question 1. One important issue is the extent to which our LNG exports can have an impact on Russia's behavior in Ukraine. Unlike Russia, which sends its natural gas to Europe through pipelines, U.S. exporters would need to first liquefy the natural gas at export terminals in the U.S., then re-gasify the natural gas at import terminals in Europe, and then finally put the gas into pipelines to get it to its destination. In addition, the first U.S. export terminal won't be completed until late 2015 or 2016. Finally, Europe has only a limited number of import terminals that can take in our product. What role, if any, would increasing U.S. LNG exports play in the immediate security situation in Ukraine?

Answer. Increasing U.S. LNG exports will not provide immediate or prompt relief for Ukraine and will play no role in in ameliorating the immediate security situation.

Concern about Russia using natural gas as a weapon against Ukraine is understandable. The Washington Post reported that

> Many members of Congress are pressing the Obama administration to use energy as a diplomatic weapon and to speed permits for natural gas export terminals to ease Europe's and Ukraine's heavy reliance on Russian supplies.[1]

There is legislation to fast track approval of additional LNG export applications by eliminating or truncating DOE's public interest review of proposed exports.[2]

Additional approval of LNG exports threatens to further hike natural gas prices and pollution, but would do little to help Ukraine. The Sabine Pass LNG facility is the export terminal nearest to completion, and its finish date is at least a year away.[3] The New York Times notes that "half of the gas that will leave [the] facility

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[1] Steven Mufson, "Can U.S. natural gas rescue Ukraine from Russia?" Washington Post, March 25, 2014, available at http://www.washingtonpost.com/blogs/wonkblog/wp/2014/03/25/can-u-s-natural-gas-rescue-ukraine-from-russia/.

[2] Ayesha Rascoe, "U.S. lawmakers mull speedier gas exports to help Ukraine, Europe," Reuters, March 25, 2014, available at http://www.reuters.com/article/2014/03/25/us-usa-lng-congress-idUSBREA2O08Z20140325.

[3] Cheniere, "Sabine Liquefaction Project Schedule," available at http://www.cheniere.com/sabine_liquefaction/project—schedule.shtml (last accessed September 2014).

has already been contracted by India and South Korea. The other half will go to British and Spanish companies."[4]

While two other exports terminals in Florida and Louisiana have recently provided final approval by the Department of Energy they will not be finished until 2018 at the earliest.[5] None of the other approved LNG terminals have even begun construction. The Post predicts that LNG exports to Ukraine could not occur until "years from now. The earliest gas exports won't come until late 2015 or 2016, and most won't get started until 2017 through 2019."[6]

Oil executives understand that the approval, construction and operation of LNG export terminals is a lengthy process. The Times reported that

> "L.N.G. exports are not about snapping your fingers and making them happen," said Marvin E. Odum, president of the Shell Oil Company, which has partnered with Kinder Morgan in a proposed export terminal in Georgia that is awaiting regulatory approval. "These are large business development projects that take several years of construction and several years of business development and engineering design."[7]

The Times concluded that "the United States can offer little hope for Europeans eager to diversify their gas sources as Russia occupies Crimea and may threaten other parts of eastern Ukraine."[8]

The bottom line is that rushing to approve more LNG exports will not provide immediate or prompt relief for embattled Ukraine, but there are other significant ways the U.S. can help them.

Rather than eliminate the public interest review of proposed LNG export facilities, the United States should expand the administration's energy efficiency assistance to Ukraine by passage of S. 2433 to help slash its energy waste.[9] Some of these efficiency measures could include replacement of inefficient furnaces and compressors with highly efficient American-made models. A similar program has already been applied by the United States Agency for International Development for a small amount of foreign assistance and proved to effectively reduce Ukrainians' energy consumption.[10] Increasing these efficiency assistance programs would reduce Ukrainian purchase of Russian gas, and create jobs both in Ukraine and the United States.

This same conclusion has also reached European Union leaders seeking to insulate themselves against an energy disruption this winter. The Guardian reports that European leaders-of nations wealthier and less vulnerable than Ukraine-are considering mandating energy efficiency improvements as the quickest way to protect themselves as the Ukrainian-Russian conflict remains unresolved. The EU also recognizes the dual benefit that these programs would have in mitigating climate change.[11]

As exported American LNG can provide no possible leverage for Ukrainians for several years, notwithstanding company contracts that are already in place to export elsewhere, efficiency is the only way to provide immediate and effective assistance Ukraine and our other European allies.

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[4] Clifford Krauss, "U.S. Gas Tantalizes Europe, but It's Not a Quick Fix," New York Times, April 7, 2014, available at http://www.nytimes.com/2014/04/08/business/energy-environment/us-gas-tantalizes-europe-but-its-not-a-quick-fix.html?_r=0.

[5] Jennifer Dloughy, "Two more LNG projects cross finish line for exports," Houston Chronicle, September 10, 2014, available at http://www.houstonchronicle.com/business/energy/article/Energy-Department-gives-out-two-more-LNG-export-5747191.php.

[6] Steven Mufson, "Can U.S. natural gas rescue Ukraine from Russia?" Washington Post, March 25, 2014, available at http://www.washingtonpost.com/blogs/wonkblog/wp/2014/03/25/can-u-s-natural-gas-rescue-ukraine-from-russia/.

[7] Clifford Krauss, "U.S. Gas Tantalizes Europe, but It's Not a Quick Fix."

[8] Ibid.

[9] Sen. Ed Markey, "Markey Introduces Legislation to Boost Ukrainian Energy Independence, Lessening Putin's Power," Press release, June 5, 2014, available at http://www.markey.senate.gov/news/press-releases/markey-introduces-legislation-to-boost-ukrainian-energy-independence-lessening-putins-power.

[10] "USAID Marks Four Years of Success in Improving Municipal Energy Efficiency in Ukraine," (2014), available at http://ukraine.usembassy.gov/events/usaid-heating-project.html.

[11] Arthur Nelson, "Europe's dependency on Russian gas may be cut amid energy efficiency focus," The Guardian, September 8, 2014, available at http://www.theguardian.com/world/2014/sep/09/europe-dependency-russian-gas-energy-efficiency-eu.

APPENDIX II

Additional Material Submitted for the Record

DEPARTMENT OF ENERGY,
June 18, 2014.

Hon. MARY LANDRIEU,
Chair, Committee on Energy and Natural Resources, U.S. Senate, Washington, DC.

DEAR SENATOR LANDRIEU:

The U.S. Energy Information Administration (EIA) proposes to expand an existing smvey to collect more timely monthly data on oil and natural gas production. This EIA smvey will be a carefully developed statistical sample which will enable EIA to publish more current monthly information on oil and gas production trends. This survey is important to EIA's short term energy outlook on whjch policymakers, the markets and the public rely.

Currrently, the EIA-914 smvey, Monthly Natural Gas Production Report, collects natural gas production data from a sample of about 240 well operators in five states (Louisiana, New Mexico, Oklahoma, Texas, and Wyoming) and the federal offshore Gulf of Mexico.

The proposed changes to EIA-9 14 are driven by the recent and substantial increases in U.S. oil and natmal gas production, largely from tight formations. Natural gas production outside the cuiTent EIA-914 states has increased substantially and some- for example, Pennsylvania and Colorado- now out-produce some of the original ElA-914 states. These changes have led EIA to propose expanding the number of states on the survey to 19 and adding the category of crude oil production by API gravity.

Additional information about the proposed changes is available in the 60-day Federal Register Notice (http://www.eia.gov/survey/frn/naturalgas/FRN-60-Day-EIA -914-May-6-20 14.pdf), which was published May 6. A draft version of the survey is available at http:/ /www.eia.gov/survey/forrn/eia 914/proposed/form.pdf.

STATEMENT OF DAVID L. GOLDWYN, DOE'S NEW PROCEDURE FOR APPROVING LNG EXPORT PERMITS: A MORE SENSIBLE APPROACH

On May 29, the Department of Energy (DOE) proposed revised procedures for reviewing applications to export liquefied natural gas (LNG) to countries which the U.S does not have free trade agreements. This long overdue revision would ensure that projects that are commercially mature and have obtained environmental clearance under the National Environmental Policy Act (NEPA) receive a prompt public interest determination from the Department of Energy. Scholars at Brookings, including Charles Ebinger and myself, have argued for this kind of rational treatment of applications since the summer of 2013 and I applaud DOE's proposed improvements.

Problems with the Prior Procedure: Delay and Hot Air

The prior DOE procedure for reviewing applications for LNG exports to non-free trade agreement (non-FTA) countries impeded the consideration of commercially mature projects by requiring applicants to queue up for conditional approvals, in the order in which they applied to DOE. DOE pledged to review applications expeditiously, noting that it was approving projects at an average interval of every eight weeks. However, with 24 applications in the queue as of March 2014, that timeline left the review of many projects more than four years in the future. That timeline applied to all projects, even projects that were able to clear their NEPA review much sooner because they were less environmentally complex or controversial, because they were more simple expansions of previously approved projects, or because

sponsors elected to initiate the NEPA review process before filing an application with DOE.

The prior procedure was politically provocative in that it exaggerated the cumulative impact of project approvals by scoring the cumulative export volumes of conditional approvals—many of which might never receive environmental clearance or final investment approval. The result was that projects which might make it through the environmental review, led by the Federal Energy Regulatory Commission (FERC) or the U.S. Maritime Administration (MARAD) depending on jurisdiction, might not be considered until they came up in the queue, possibly years later, or might be rejected altogether because they exceeded the soft cap of 12 billion cubic feet per day (Bcf/d).[1]

Almost exactly one year prior to the DOE announcement, a Brookings paper suggested that if DOE wanted to preserve its current process, it ought to let FERC-approved, commercially mature projects "jump the queue" and receive prompt consideration for a national interest determination. In proposing this change, DOE has vastly improved on "jump the queue" with its new process, which is, effectively, "dump the queue." Bravo.

The Proposed Procedure—Commercially Savvy, Politically Savvy

DOE proposes to dispense with conditional approvals and only issue public interest determinations for projects that have completed their environmental assessment as required by NEPA, generally led by FERC or MARAD. This has multiple benefits for all serious applicants. First, it sets a level playing field for all applicants by entitling any applicant to prompt consideration once they complete their environmental review. Second, it eliminates the risk of delay to all applicants whose turn would have come after conditional approvals reached a cumulative tally of 12 Bcf/d[2], removing the chance that they would face indefinite delays or outright rejection while DOE solicited new analysis of exports exceeding 12 Bcf/d. Under DOE's proposed procedure the cumulative tally is now effectively 2.2 Bcf/d (the volume of exports that have already received final approval), and the next 9.8 Bcf/d in projects that emerge from FERC should be approved unless market conditions radically change. In addition, DOE also announced that it would seek updated analysis from the Energy Information Administration and an external group to consider the effect of exports between 12 and 20 Bcf/d, further reducing the chance of a soft cap hindering future project approvals. Third, the analysis of the impact of LNG exports on the economy would be calculated in the year the project is ready for approval, not years in advance. This would provide a more accurate projection by using current data.

Winners and Losers

The winners here are the applicants that are doing their homework by proceeding with the required environmental review and securing customers. The companies that have already received conditional non-FTA export licenses from DOE and have also started the NEPA process at FERC are no worse off—they always had to clear FERC to get a final approval. Other winners are those applicants beyond number two in the queue (those that would have been considered after conditional approvals reached 12 Bcf/d)—their risk of rejection has dropped considerably. The biggest winners are those projects at the bottom of the queue, which now have as good a chance to be approved by FERC. Those projects can now compete on a level playing field without worry that customers might perceive their position in the DOE queue as a commercial liability. Among the losers are those applicants who sought a marketing license from DOE but did not have, or could not attract, the funds to mount a serious project. Those projects were always gum in the works.

Improving the National Interest Determination

Finally, DOE has taken the prudent step of considering the upstream effects of producing natural gas for export and the lifecycle effects of LNG exports. While this step was entirely discretionary and not required under NEPA (as noted by DOE in

[1] While DOE never announced a cap of any kind, the fact that the NERA study focused on exports of to 12 bcf/d, and that each DOE order cited this number led analysts to assume that a new study would be required for exports in excess of 12 Bcf/d. DOE's announcement of updated studies to assess the impacts of exports between 12 and 20 Bcf/d appears to confirm this view.

[2] As of June 3, 2014, the U.S. Department of Energy had approved 9.27 Bcf/d of LNG exports, 7.07 Bcf/d of which was in the form of conditional permits. The cumulative volume would have exceeded 12 Bcf/d with the approval of the Cheniere Marketing project, currently number two in the queue, assuming that both it and the project preceding it, Oregon LNG, were approved for the full volumes requested (2.1 and 1.25 Bcf/d respectively). Approval of the Cheniere project would have pushed the cumulative tally to 12.62 Bcf/d.

the Federal Register notice and public announcement regarding the papers), it should preempt the inevitable criticism that DOE's national interest determination would attract if it had not considered these environmental issues.

Numerous studies, including a Brookings report on liquid markets and the EIA's Annual Energy Outlook 2014, show that U.S. LNG exports are unlikely to exceed even 6 Bcf/d in the next 10 years. Fears that LNG exports will drive up domestic natural gas prices significantly remain unsupported by credible evidence. One uncertainty does remain, however, even for export projects that complete their NEPA review. The U.S. is alone in its peer group in its issuance of national interest determinations for LNG exports, a Congressionally mandated determination that raises questions about the right to export even for projects that receive a final export permit, because the government retains the right to rescind export permits in the event that market conditions or other factors render them to no longer be in the national interest. This is a significant uncertainty that is not faced by LNG export projects in competing countries like Russia, Australia, Canada or Qatar. While this uncertainty will continue to remain as a specter over the U.S. LNG export industry, it is outside of the jurisdiction of DOE to abolish this process—only the direct action of the Congress could achieve such an outcome. In spite of lingering concerns and uncertainties, at last, the decision as to which projects will succeed will be made on merit, by considering those who have met the legal requirements in the order that they complete their environmental assessments mandated by NEPA.

The only major lacuna in DOE's procedure is a commitment by the agency to complete its consideration of the public interest determination promptly. We believe that the Energy Policy Act of 2005 requires all agencies that cooperate with FERC to complete their work within 90 days of FERC's environmental review.[3] In addition to all of the reasons that DOE has already given for this process change, if DOE were also to recognize and commit to meeting this 90-day requirement, the agency will meet its obligations under EPACT 2005 and will also have put in place a process that is transparent, fair and prompt. This will enable potential LNG customers to pick their partners based on their ability to complete the work required for approval. This is a vast improvement over the current process, and DOE is to be complimented for correcting its course.

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[3] The Energy Policy Act of 2005 (2005 EPAct) establishes FERC as the lead agency responsible for coordinating review by other federal and state agencies of LNG export projects, encouraging structure and timeliness in the LNG review process, providing that the FERC "shall establish a schedule for all Federal authorizations "to (1) 'ensure expeditious completion of all such proceedings,' and (2) 'comply with applicable schedules set by Federal law.'" (15 U.S.C. 717n(c)) Notably, EPAct 2005 also sets a deadline of 90 days for agencies to provide final decisions in a timely manner, stating that "a final decision on a request for a Federal authorization is due no later than 90 days after the Commission issues its final environmental document, unless a schedule is otherwise authorized by Federal law." (18 C.F.R. 157.22) Indeed, the typical FERC "Notice of Schedule for Environmental Review" directs Federal agencies issung federal authorizations "to complete all necessary reviews and to reach a final decsion on the request for a federal authorizaton within 90 days of the issuance of the Commsion staff's final Environmenal Imact Statement (EIS) for the Project." (U.S. Federal Energy Regulatory Commission, "Notice of Schedule for Environmental Review of the Corpus Christi LNG Project," (12 February 2014) http://elibrary.ferc.gov/idmws/search/advResults.asp)