

Subcommittee on Energy and Mineral Resources

Paul Gosar, Chairman
Hearing Memorandum

February 23, 2018

To: All Subcommittee on Energy and Mineral Resources Subcommittee Members

From: Majority Committee Staff, Kate Juelis (x6-9837)
Subcommittee on Energy and Mineral Resources

Hearing: Oversight Hearing entitled “*Liquefied Natural Gas and U.S. Geopolitics*”
February 27, 2018 at 2:00 p.m.; 1324 Longworth House Office Building

The Subcommittee hearing will take place on **February 27, 2018, at 2:00 p.m., in 1324 Longworth House Office Building**. This hearing will examine the emerging role of the United States in liquid natural gas (LNG) markets, and associated benefits of natural gas production, transmission, and exportation for America and its allies.

Policy Overview:

- Less than two decades ago, the U.S. faced a growing dependence on imported natural gas supplies to meet domestic demand. Advancements in horizontal drilling and hydraulic fracturing spurred the development of previously inaccessible shale gas reserves, transforming domestic gas production capabilities and unleashing sustained economic growth in regions across the country.
- America’s “shale revolution” has transitioned the U.S. from a position of energy scarcity to one of energy abundance and security, with growing impacts in global energy markets.
- In 2009, the U.S. became the world’s largest producer of natural gas.¹ In 2017, the U.S. became a net exporter of natural gas for the first time since 1957.²
- The hearing will review the opportunities associated with increased U.S. presence in global natural gas markets, including providing U.S. allies with reliable energy sources, strengthened geopolitical relationships to the detriment of hostile nations and continued stable and affordable domestic supply.

¹ U.S. Energy Information Association, “United States remains the world’s top producer of petroleum and natural gas hydrocarbons.” (<https://www.eia.gov/todayinenergy/detail.php?id=31532>), July 2017.

² Malik, Naureen S., “U.S. Becomes a Net Gas Exporter for the First Time in 60 Years.” Bloomberg Markets, (<https://www.bloomberg.com/news/articles/2018-01-10/u-s-became-a-net-gas-exporter-for-the-first-time-in-60-years>), Jan 11, 2018.

Invited Witnesses (in alphabetical order):

Mr. Peter Doran
President and CEO
Center for European Policy Analysis
Washington, DC

Ms. Meg Gentle
President and CEO
Tellurian, Inc.
Houston, TX

Mr. David Livingston
Deputy Director for Climate & Advanced Energy
Atlantic Council
Washington, D.C.

Mr. Christopher Smith
Senior Vice President
Policy, Government and Public Affairs
Cheniere Energy, Inc.
Houston, TX

Background

Producing on American Shores: Developing Production and Export Capabilities

In the past decade, the U.S. has become an undeniable force at the center of international energy markets. Today, the U.S. is the largest natural gas producer in the world, a title held since surpassing Russian production in 2009. This dominance in production has coincided with an increasing global demand for natural gas driven by several factors, namely the affordability, abundance, and low greenhouse gas emissions produced by the fuel.

Demand for this clean and abundant fuel is surging around the world. In just two decades, the global demand for natural gas has tripled, and shows no signs of slowing as demand as well as production and transportation technology continues to grow.³ Demand in China, for example, steadily rose throughout 2017 as the nation's industrial centers move away from coal as a foundational fuel source.⁴ China is now the second largest importer of natural gas in the world. The abundant market opportunity is an enticing opportunity for many U.S. producers and LNG

³ Canadian Association of Petroleum Producers, "An Overview of the World LNG Market and Canada's Potential for Exports of LNG- An Update," July 2015.

⁴ Smith, Matt, "China's Natural Gas Consumption Soars," OilPrice.com, (<https://oilprice.com/Energy/energy-general/Chinas-Natural-Gas-Consumption-Soars.html>), Dec 20, 2017.

exporters. Just this month, Houston-based Cheniere Energy, Inc. signed the first ever long-term supply contract with the Chinese National Petroleum Corporation.⁵

Last year, the U.S. became a net natural gas exporter for the first time in 60 years.⁶ The U.S. Energy Information Agency projects that the U.S. will build on this milestone, and continue to increase its export margin as more LNG export terminals are permitted and constructed.⁷ The Federal Energy Regulatory Commission (FERC) permits LNG export terminals and applications have increased significantly in recent years, with FERC currently evaluating 12 pending export terminal applications for facilities located around the country.⁸

LNG export facilities are either in full operation or are under construction on all American coasts. The Gulf Coast is home to the U.S.'s largest export facilities, and there are currently nine export terminals in various stages of construction across the Gulf. Cheniere's Sabine Pass Terminal, located in Cameron, Louisiana, has led the way in U.S. LNG exports, and after adding a fourth LNG unit, became the world's second largest export terminal after Qatar's Ras Laffan Industrial City Complex.⁹ Expanded capacity, coupled with the Panama Canal's recent expansion, now allows a Sabine Pass shipment to reach any major import terminal in the world within 25 days.¹⁰ Excluding Alaska's Kenai LNG facility, Cheniere is the first American company to export LNG from the U.S. In 2016, Cheniere exported over 160 shipments to Latin America, Asia, and Western and Central Europe.¹¹

LNG export terminals exist and have been approved on other American coasts. Kenai LNG, built in 1969 and located in Nikiski, Alaska, was the first in long-distance shipments of Alaskan gas to Japan, and provided critical gas shipments following the tsunami that crippled that country's nuclear generation plants.¹² A few miles south of D.C., in Lusby, Maryland, Dominion Energy has constructed a major LNG export facility. This center is designed to liquefy and export .7 billion cubic feet per day of Marcellus-produced natural gas to Europe.¹³ The

⁵ Crooks, Ed and Terazono, Emiko, "Cheniere signs long-term LNG export deal with China," *The Financial Times*, (<https://www.ft.com/content/cf27354a-0dbf-11e8-8eb7-42f857ea9f09>), Feb 9, 2018.

⁶ *Supra*, note 2.

⁷ U.S. Energy Information Agency, "The United States is projected to become a net energy exporter in most AEO2018 cases," (<https://www.eia.gov/todayinenergy/detail.php?id=34912>), Feb 12, 2018.

⁸ Federal Energy Regulatory Commission, "North American LNG Export Terminals: Proposed," (<https://www.ferc.gov/industries/gas/indus-act/lng/lng-proposed-export.pdf>), Jan 24, 2018.

⁹ Blum, Jordan, "U.S. LNG exports reach a tipping point," *The Houston Chronicle*, (<https://www.houstonchronicle.com/business/energy/article/U-S-LNG-exports-reach-a-tipping-point-12413699.php>), Dec 7, 2017.

¹⁰ Clemente, Jude, "The U.S. Is Transforming the Global Liquefied Natural Gas Market," *Forbes*, (<https://www.forbes.com/sites/judeclemente/2017/04/16/the-u-s-is-transforming-the-global-liquefied-natural-gas-market/#17e27df122ef>), Apr 16, 2017.

¹¹ Sheppard, David, "Lithuania becomes first ex-Soviet state to buy US Natural Gas," *The Financial Times*, (<https://www.ft.com/content/33113758-8680-11e7-8bb1-5ba57d47eff7>), Aug 21, 2017.

¹² "Andeavor buys Kenai LNG plant in Alaska from ConocoPhillips, S&P Global Platts," (<https://www.platts.com/latest-news/natural-gas/anchorage/andeavor-buys-kenai-lng-plant-in-alaska-from-21241295>), Feb 5, 2018.

¹³ "LNG export terminal on line in fourth quarter," *Reuters*, (<https://www.reuters.com/article/us-dominion-inc-covepoint-lng/dominion-sees-maryland-cove-point-lng-export-terminal-on-line-in-fourth-quarter-idUSKBN1CM2NJ> <https://www.reuters.com/article/us-dominion-inc-covepoint-lng/dominion-sees-maryland-cove-point-lng-export-terminal-on-line-in-fourth-quarter-idUSKBN1CM2NJ>), Oct 17, 2017.

approval process of the Jordan Cove LNG export terminal, to be located in Coos Bay, Oregon, is being closely watched by the industry.

The development of LNG complexes brings both local and national benefits in terms of jobs and economic growth. According to a 2017 study, increased exports of LNG are projected to create between 220,000 and 452,000 jobs and add \$73 billion to the U.S. economy.¹⁴ The planned Plaquemines LNG liquefaction facility and export terminal is projected to create about one thousand jobs throughout Plaquemines Parish, Louisiana.¹⁵ The facility will directly employ about 300 direct workers, with employees receiving an average annual salary of \$70,000.¹⁶ Furthermore, the production and treatment of the natural gas flowing in to these facilities supports millions of jobs throughout the country.¹⁷

Further, with domestic natural gas production slowing at times in recent years due to low commodity prices, oversupply, infrastructure and pipeline constraints, among other variables, expanded exports also provides a market stabilizing effect to reinvigorate development in shale producing regions across the U.S.

One of the greatest challenges to bringing LNG export terminals on line is the environmental review process prescribed by the National Environmental Policy Act (NEPA). Permits for the construction of LNG terminals are issued by FERC, while the Department of Energy's Office of Fossil Energy (DOE/FE) authorizes the export and import of the commodity.¹⁸ The various components of the NEPA environmental review process severely expose LNG terminal applicants to environmental lawsuits. Recently, the Sierra Club challenged the three LNG permits for terminals in Maryland, Texas, and Louisiana. The environmental group argued that the DOE failed to assess the greenhouse gas emissions produced from increased upstream production. The DC Circuit court denied these petitions in November of 2017, citing their own previous decisions upholding LNG terminal permits.¹⁹ To effectively serve the facilities, a network of pipeline infrastructure is needed to transport the natural gas. NEPA has complicated the gas pipeline permitting process as well. For example, the DC Circuit Court recently declined to review a 2017 decision that held FERC did not effectively assess

¹⁴ Tadeo, Michael, "Increased U.S. Natural Gas Exports Boost Jobs and Accelerate Economic Growth, Study Says," American Petroleum Institute, (<http://www.api.org/news-policy-and-issues/news/2017/10/03/increased-us-natural-gas-exports-boost-jobs-and-accelerate-economic-growth-says>), Oct 3, 2017.

¹⁵ "Louisiana: Plaquemines Parish Lands \$8.5-Billion LNG Complex," Business Facilities, (<https://businessfacilities.com/2017/03/louisiana-plaquemines-parish-lands-8-5-billion-lng-complex/>), Mar 28, 2017.

¹⁶ "Plaquemines LNG – Quick Facts," Venture Global LNG, (<http://ventureglobalng.com/plaquemines-project/plaquemines-lng-quick-facts/#.WpAraKjwaUk>).

¹⁷ "Natural Gas: America's Abundant, Clean Energy," Energy Tomorrow, (<http://energytomorrow.org/american-energy/natural-gas>).

¹⁸ Brown, Jeremy, "NEPA and Environmental Impacts of LNG Exports," The Kay Bailey Hutchison Center for Energy, Law, and Business, (<https://www.kbhenergycenter.utexas.edu/2014/09/30/nepa-and-environmental-impacts-of-lng-exports/>), Sep 30, 2014.

¹⁹ "DC Circuit upholds DOE LNG export approvals for three terminals," S&P Global Platts, (<https://www.platts.com/latest-news/natural-gas/washington/dc-circuit-upholds-doe-lng-export-approvals-for-21423323>), Nov 1, 2017.

greenhouse gas impacts from a major interstate natural gas pipeline.²⁰ Clearly, the NEPA process still exposes these important projects and associated infrastructure to costly and dilatory lawsuits.

LNG and U.S. Geopolitics

The international conversation about natural gas inevitably focuses on Russia as the long established and often sole supplier to Eastern and Central European countries. Due to its population density and public pledges to reduce greenhouse gas emissions, demand in Europe for natural gas has skyrocketed. Between 2015 and 2016, demand for natural gas in the 28 European Union (EU) nations increased 7%.²¹ European countries are shutting down their coal-fired power plants in favor of natural gas plants, and are seeking to shut down nuclear facilities throughout the continent. These factors, paired with a decrease in continental gas production, set the EU on a path towards increased natural gas imports.²² Currently, Norway, the UK, and the Netherlands together supply about half of the continent's natural gas demand. Russia's state-owned natural gas company, Gazprom, supplies the remaining half.²³ According to Deputy Secretary of State John McCarrick, in 2015, 11 European countries relied on Russian gas to meet 75% of their energy needs. These countries are particularly exposed to any supply disruptions, whether intentional or not.²⁴

Gazprom has strong ties to the European market, due to the existing infrastructure of pipelines running east to west, low production costs, and seemingly endless gas reserves. Furthermore, both Gazprom and Rosneft, Russia's national oil company, enjoy favorable tax regimes and advantageous exchange rates, as they expend in rubles but sell in U.S. dollars.²⁵

In 2012, Russia completed construction on the longest sub-sea pipeline in the world, Nord Stream. Comprised of two gas lines, this pipeline has an annual capacity of 55 billion cubic meters, and runs 760 miles from Vyborg, Russia, across the Baltic Sea, to Greifswald, Germany.²⁶ This year, Nord Stream approached full transmission capacity.²⁷ Proposals to construct a second pipeline, Nord Stream 2, have raised considerable concern throughout the

²⁰ Bade, Gavin, "DC Circuit ruling could halt Sabal Trail pipeline construction," Utility Dive, (<https://www.utilitydive.com/news/dc-circuit-ruling-could-halt-sabal-trail-pipeline-construction/516134/>), Feb 1, 2018.

²¹ Eurostat: Statistics Explained, (http://ec.europa.eu/eurostat/statistics-explained/index.php/Natural_gas_consumption_statistics), July 2017.

²² "EU natural gas demand to stay at current levels despite likely boost from power: IEA," S&P Global Platts, (<https://www.platts.com/latest-news/natural-gas/london/eu-natural-gas-demand-to-stay-at-current-levels-26839977>), Nov 14, 2017.

²³ Sheppard, David, and Foy, Henry, "US and Russia step up fight to supply Europe's gas," The Financial Times, (<https://www.ft.com/content/352f4cac-6c7a-11e7-b9c7-15af748b60d0>), Aug 3, 2017.

²⁴ Telephonic Press Briefing with John McCarrick, Deputy Secretary of State, Bureau of Energy Resources, U.S. Department of State, Brussels, Belgium, (<https://www.state.gov/r/pa/ime/useuropeanmediahub/276201.htm>), Nov 29, 2017.

²⁵ *Supra*, note 1.

²⁶ Nord Stream: The Pipeline, (<https://www.nord-stream.com/the-project/pipeline/>).

²⁷ "Nord Stream gas system approaching full capacity," Offshore Magazine, (http://www.offshore-mag.com/articles/2018/01/nord-stream-gas-system-approaching-full-capacity.html?cmpid=enl_offshore_offshore_daily_newsletter_2018-01-30&pwhid=89755e5d7a1dde8d1a3219fe88f369971db366a46303ddc1baacff54de98eadd800931c4d1e93768c4931cd b3aa6175003bd17efd74fbf8cc4cf5ffb5ffed21&eid=402869084&bid=1988077), Jan 29, 2018.

continent. Nord Stream 2, as proposed, would run along the existing Nord Stream pipeline and double its westbound gas shipping capacity. If completed, 75% of natural gas supply to Europe would be supplied by Russia.

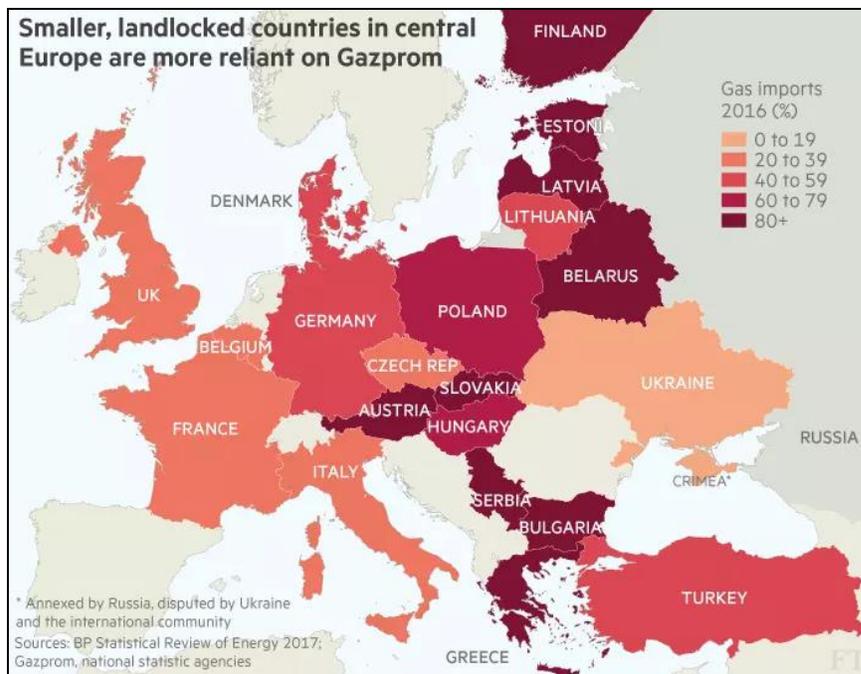


Figure 2: European Reliance on Russian Gas²⁸

Although Germany supports the construction of Nord Stream 2, the U.S. and many other countries have voiced opposition to the Nord Stream 2 project, as it would only increase dependence on Russian gas and defeat ongoing attempts at energy diversification throughout the continent. For example, in late 2017, Denmark passed a law that would allow authorities to block a pipeline project based on foreign policy or national security reasons.²⁹ Because Nord Stream 2 would run through Danish waters, Russia could be required to design an alternative route. In a joint statement with U.S. Secretary of State Rex Tillerson, Polish Foreign Minister Jacek Czaputowicz expressed his country’s opposition to the project because it would undermine Europe’s overall energy security and allow Russia increased political influence on the continent.³⁰

Despite the Russian attempts to maintain a stranglehold on the European market, the first shipment of American-produced LNG was delivered to an import terminal in Klaipeda, Lithuania, in August 2017. Cheniere’s shipment from the Sabine Pass Terminal was hailed as monumental, as Lithuania was exclusively reliant on gas supply from Russia for decades.

²⁸ *Supra*, note 23.

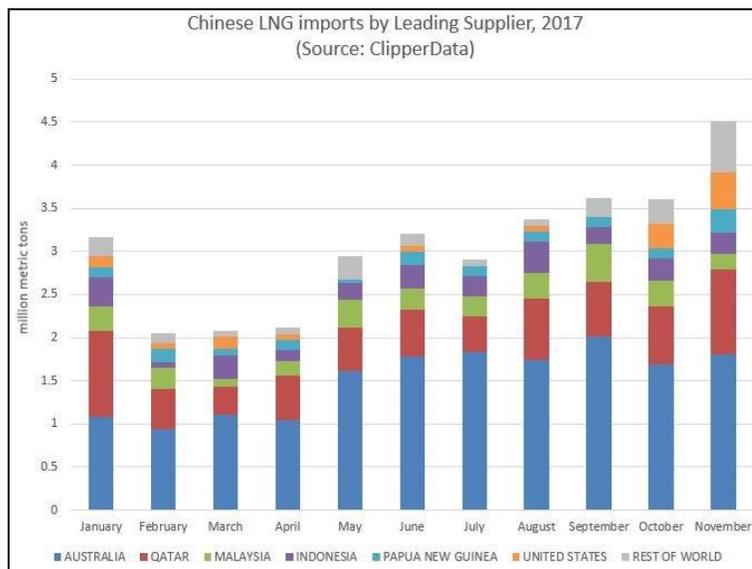
²⁹ Matzen, Erik and Jacobsen, Stine, “Denmark passes law that would ban Russian pipeline from going through its waters,” Reuters, (<https://www.reuters.com/article/us-denmark-pipeline/denmark-passes-law-that-could-ban-russian-pipeline-from-going-through-its-waters-idUSKBN1DU19L>), Nov 30, 2017.

³⁰ NewEurope, “US and Poland oppose Russia-backed Nord Stream 2 gas pipeline to Europe,” (<https://www.neweurope.eu/article/us-and-poland-oppose-russia-backed-pipeline-to-europe/>), Jan 29, 2018.

Lithuanian Energy Minister Zygimantas Vaiciunas heralded the deal as “not only politically desirable but also commercially viable.” Lithuania’s continued diversification efforts present a unique opportunity for U.S. LNG exporters.

Increasing demand for LNG shipments in Asia also presents enticing market opportunities for American LNG exporters. In the past year, demand for global LNG imports rose 20% throughout China, South Korea, and Japan.³¹ Last year also saw Chinese LNG imports overtake South Korean import volumes, making China the second-largest importer of LNG in the world. Paired with export terminal delays in Texas and Louisiana, the market is expected to remain tight through the remainder of 2018. Nearby India currently operates four LNG import terminals, and is planning to add 11 more.³²

While South Korea and Japan have imported LNG for some time, China’s increased interest in natural gas has caught the attention of American exporters. China, to fuel its rapidly expanding economy but decrease smog and greenhouse gas emissions, is looking to LNG to meet these requirements. According to Bloomberg Intelligence, China’s LNG demand is set to surge from 38.1 million metric tons in 2017 to 82 million tons in 2030.³³ Earlier this month, Houston-based Cheniere Energy, Inc. announced a 25-year supply contract with China. Under this agreement, Cheniere will supply China with 1.2 million tons of LNG per year, through 2043.³⁴ Meanwhile, China is planning to expand its underground gas storage capacity to 15 billion cubic meters by 2020, and double that amount by 2030.³⁵



³¹ “Update1-Asia’s soaring gas demand opens window for new LNG projects,” Reuters, (<https://www.reuters.com/article/asia-lng/update-1-asias-soaring-gas-demand-opens-window-for-new-lng-projects-idUSL4N1Q43A6>), Feb 14, 2018.

³² *Id.*

³³ Slav, Irina, “Will China Repeat Last Year’s LNG Import Surge?” Oilprice.com, (<https://oilprice.com/Energy/Energy-General/Will-China-Repeat-Last-Years-LNG-Import-Surge.html>), Feb 18, 2018.

³⁴ *Supra*, note 5.

³⁵ *Supra*, note 33.

Figure 3: Chinese LNG Imports by Supplying Country, 2017³⁶

Australia is China’s largest supplier, and is very well positioned to meet this growing demand. Abundant resources are located offshore in northwestern Australia, and 20 LNG export terminals are either planned or under construction around the Australian coasts.³⁷ Currently, more than half of Australia’s natural gas production was liquified and exported in 2016. The country is expected to export 80% of total production by 2020.³⁸ In 2017, revenue from LNG exports totaled \$20.51 billion.³⁹ Australia’s abundant and accessible geological resources make it well positioned to meet this long-term demand increase.

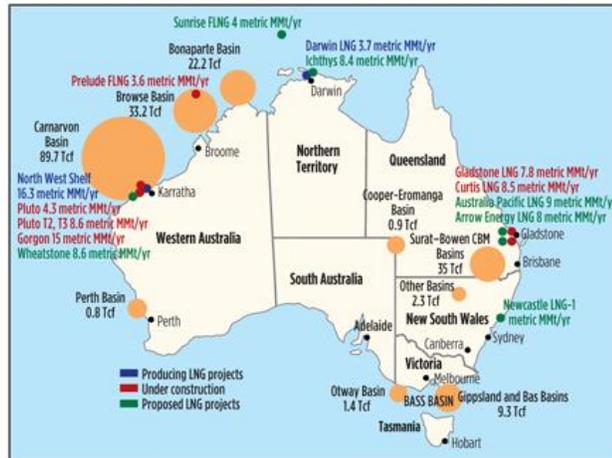


Figure 4: Map of Australian Natural Gas Basins⁴⁰

Preparing for Long Term Success on the International Market

The natural gas market is becoming increasingly globalized, presenting unique and lucrative opportunities for American LNG exporters and range of other U.S. sectors. U.S. natural gas production and exports have hit record highs in recent years to meet demand at home and abroad. As LNG markets quickly evolve, more meaningful opportunities for American exports emerge. It is critical that natural gas production be supported in the U.S., and that export terminal projects be permitted in a reasonable and reliable timeline.

³⁶ *Supra*, note 4.

³⁷ Boxscore Construction Analysis, Gas Processing News, (<http://www.gasprocessingnews.com/columns/201310/boxscore-construction-analysis.aspx>).

³⁸ U.S. Energy Information Administration, “Australian domestic natural gas prices increase as LNG exports rise,” (<https://www.eia.gov/todayinenergy/detail.php?id=33412>), Oct 20, 2017.

³⁹ Granger, Dale, “Australian LNG Exports Hit Record Highs in 2017,” (Oil and Gas Investor, (<https://www.oilandgasinvestor.com/australian-lng-exports-hit-record-highs-2017-1678556>), Jan 16, 2018.

⁴⁰ *Supra*, note 38.