U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE

June 22, 2018

TO: Members, Subcommittee on Energy

FROM: Committee Majority Staff

RE: Hearing entitled "The Shifting Geopolitics of Oil and Gas."

INTRODUCTION

The Subcommittee on Energy will hold a hearing on Tuesday, June 26, 2018, at 1:00 p.m. in 2123 Rayburn House Office Building. The hearing is entitled "The Shifting Geopolitics of Oil and Gas." This hearing will examine the current state of U.S. oil and gas development and production and the associated geopolitical, security, and economic impacts.

WITNESSES

- **Daniel Yergin**, Vice Chairman, IHS Markit;
- **Harold Hamm**, CEO, Continental Resources;
- **Dennis Arriola**, Chief Strategy Officer, Sempra Energy; and
- **Kevin Kennedy**, Deputy Director, U.S. Climate Initiative, World Resources Institute.

BACKGROUND

Reliable access to adequate and affordable supplies of energy is a fundamental need for all countries. Energy security impacts everything from quality of life to a nation's geopolitical standing. Historically, American energy needs have been met through a mixed supply of domestic and international energy resources; however, over the past decade, U.S. domestic energy needs have increasingly been met through domestic energy production, creating important economic benefits in the form of jobs and capital investments, and new opportunities for energy diplomacy.

Energy Production

The United States is in the midst of an energy revolution, marked by a significant expansion of access to economically recoverable domestic oil and gas resources. Since 2005, U.S. natural gas production has increased by about 50 percent and U.S. field production of crude oil has more than doubled to over 10 million barrels per day, making the United States the largest producer of oil and natural gas in the world.[1] This increase is largely attributed to advancements

[1] See EIA Today in Energy, May 21, 2018, U.S. Natural Gas Production, and U.S. Field Production of Crude Oil.

in new energy technologies and methods, such as horizontal drilling and hydraulic fracturing, allowing energy producers to increase the performance of new wells, especially in shale rock and tight formations. The positive impact of technological development on production efficiencies is evidenced by the fact that U.S. oil and gas production has continued to increase even though the number of drilling rigs active today is about half the number that were in operation in 2008.[2]

Energy Consumption

The United States consumes more energy from petroleum than from any other source of energy (37 percent of all energy consumed). This is primarily because 92 percent of the nation's transportation energy needs are met by petroleum products such as gasoline. The second largest source of energy consumed domestically is natural gas (29 percent of all energy consumed). [3] Natural gas serves as a significant energy source for the nation's electric power sector, and the residential, commercial, and industrial sectors. Consumption trends over the last decade show that the electric power sector is consuming higher quantities of natural gas as the U.S. electricity mix transitions to a larger share of natural gas power plants. This is evidenced by the fact that in 2017 the electric power sector consumed 50 percent more natural gas than it did in 2005.[4]

Energy Imports and Exports

Over the past 60 years, the United States has been a net importer of energy, meaning that more energy products have been imported to the country than exported. U.S. reliance on foreign energy imports peaked in 2005 when the U.S. was importing about eight times more energy than it exported.[5] During this period, nations comprising the Organization of the Petroleum Exporting Countries (OPEC) served as the main supplier to the U.S. However, since 2005, U.S. net energy imports have declined to the point where imports are now only about 20 percent greater than energy exports.[6] According to EIA, this trend is expected to continue, allowing for the U.S. to become a net energy exporter in 2022.[7] One factor that is driving this trend is the increased levels of crude oil and refined products being exported from the U.S., following Congress's removal of the restrictions on crude oil exports in 2015. U.S. crude oil exports grew to an average of 1.1 million barrels per day in 2017, the second full year since restrictions on crude oil exports were removed by Congress.[8]

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[2] See EIA Active Well Service Rigs in Operation
[3] See EIA U.S. Energy Facts Explained, Consumption and Production
[4] See EIA Natural Gas Consumption by Sector
[5] See EIA Primary Energy Imports and Primary Energy Exports
[6] *Id.*
[7] See EIA Today in Energy, February 12, 2018
[8] See EIA Today in Energy, March 15, 2018

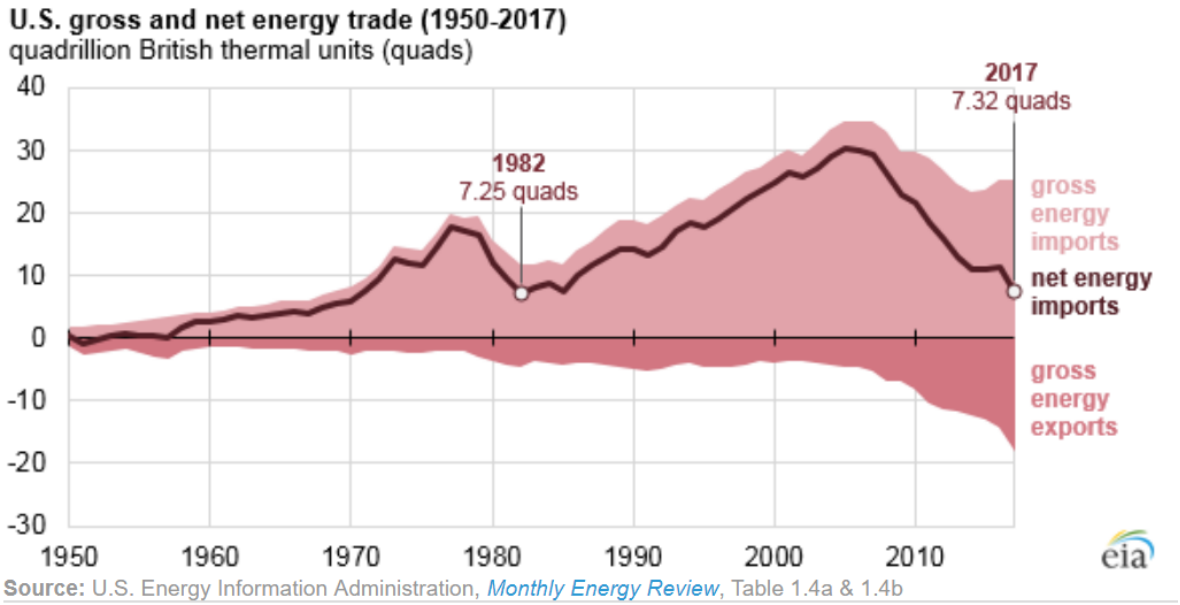

Fig. 1. Net energy imports have declined by 75 percent since peaking in 2005.

Energy Infrastructure

A major factor affecting the United States' ability to deliver products to market is the capacity of the nation's interstate and cross-border pipelines, shipping ports, and liquified natural gas (LNG) terminals. The cross-border pipeline network connecting the United States with Canada and Mexico allows for the reliable and safe transportation of petroleum liquids and natural gas products. Currently, there are 17 petroleum liquid pipeline border crossings and 27 natural gas pipeline crossings between the U.S. and Canada. Likewise, between the U.S. and Mexico, there are six petroleum liquid pipeline border crossings and 20 natural gas pipeline crossings.[9] With regard to U.S. energy exports to Canada and Mexico, nearly all natural gas exports, and a significant portion of crude oil and petroleum product exports, are accomplished via pipeline.[10] Mexico in particular is becoming an increasingly larger consumer of U.S. natural gas via pipeline. In 2017, the U.S. delivered by pipeline 46 percent more natural gas to Mexico than it did in 2015.[11] As this trend continues, additional cross-border pipelines will likely be needed in order to accommodate Mexico's growing natural gas demands.

Over 70 percent of total U.S. crude oil and petroleum product exports are accomplished by loading oil tankers at shipping ports and through the use of ship-to-ship transfers known as lightering.[12] Most U.S. Gulf Coast ports are capable of accepting vessels that can hold 500,000 barrels of crude oil, while only a limited number of ports can accommodate vessels with a capacity of 1 million barrels. The only U.S. port capable of accommodating vessels with a capacity of 2 million barrels, known as Very Large Crude Carriers (VLCC), is the Louisiana

[9] Congressional Research Service (CRS) Memo to House Committee on Energy and Commerce, June 18, 2018
[10] See EIA U.S. Natural Gas Exports
[11] See EIA U.S. Natural Gas Exports to Mexico
[12] See EIA Today in Energy May 16, 2018 and Petroleum Exports by Destination

Offshore Oil Port.[13] As U.S. port infrastructure is expanded to be able to accommodate larger shipping vessels, higher economies of scale will be achieved, enabling the U.S. to export more crude oil across the world.

In recent years, a growing share of U.S. natural gas exports has been in the form of LNG transported by vessel, enabled by the recent construction of new LNG export terminals.[14] In 2017, the U.S. exported 707 billion cubic feet (Bcf) of natural gas, a significantly higher volume than the 28 Bcf exported in 2015.[15] Current LNG export capacity is nearly four billion cubic feet per day (Bcf/d) and four more LNG projects are scheduled to come online in the next two years, which will expand LNG export capacity to 9.6 Bcf/d.[16] This rise in LNG export capacity is allowing the U.S. to export significant quantities of natural gas to countries around the globe, such as South Korea, China, and Japan, who have been the primary buyers of U.S. LNG in 2018.[17]

Global Energy Markets

Over the past decade, the United States has become the largest producer of petroleum products in the world, producing 15 percent of the world's petroleum products in 2017.[18] The other two largest oil producers in the world are Saudi Arabia, a member of OPEC, and Russia.[19] One oil market development that has been directly affecting global oil supply and the price of oil has been the production agreement between OPEC and 11 other non-OPEC countries, including Russia, that is set to expire at the end of 2018.[20] As a result of the agreement, world oil production has been reduced by approximately 1.8 million barrels per day; however, this reduction has largely been counter-balanced by rising oil production from the United States. OPEC held its 174th Ordinary Meeting in Vienna, Austria on June 22, 2018, where energy ministers and major oil producers gathered to discuss the stability of global oil markets and agreed to increase production levels to match the originally specified production levels in the 2016 agreement.[21]

Additional sources of geopolitical risk impacting energy markets include the political and economic crisis in Venezuela and the re-instatement of U.S. sanctions on Iran. In 2017, Iran produced 4.67 million barrels per day, making it the 5th largest oil producer in the world.[22] Venezuela's oil production has been declining over the past two decades. In the late 1990s

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[13] *Id.*
[14] See EIA Today in Energy December 7, 2017
[15] See EIA U.S. Natural Gas Exports
[16] See EIA Today in Energy December 7, 2017
[17] See EIA U.S. Natural Gas Exports
[18] See EIA Top Producers of Oil
[19] See EIA Today in Energy May 21, 2018
[20] See CRS Report on May 30, 2018, Global Oil Markets and U.S. Gasoline Prices 2018
[21] See Wall Street Journal, "OPEC Agrees to Deal to Lift Oil Output" on July 22, 2018. Group-level compliance with the 2016 OPEC/Non-OPEC agreement has exceeded commitment levels resulting in a larger production decline than intended.
[22] See EIA Top Producers of Oil

Venezuela was producing over three million barrels per day, but by 2017, this number declined to under two million barrels per day.[23]

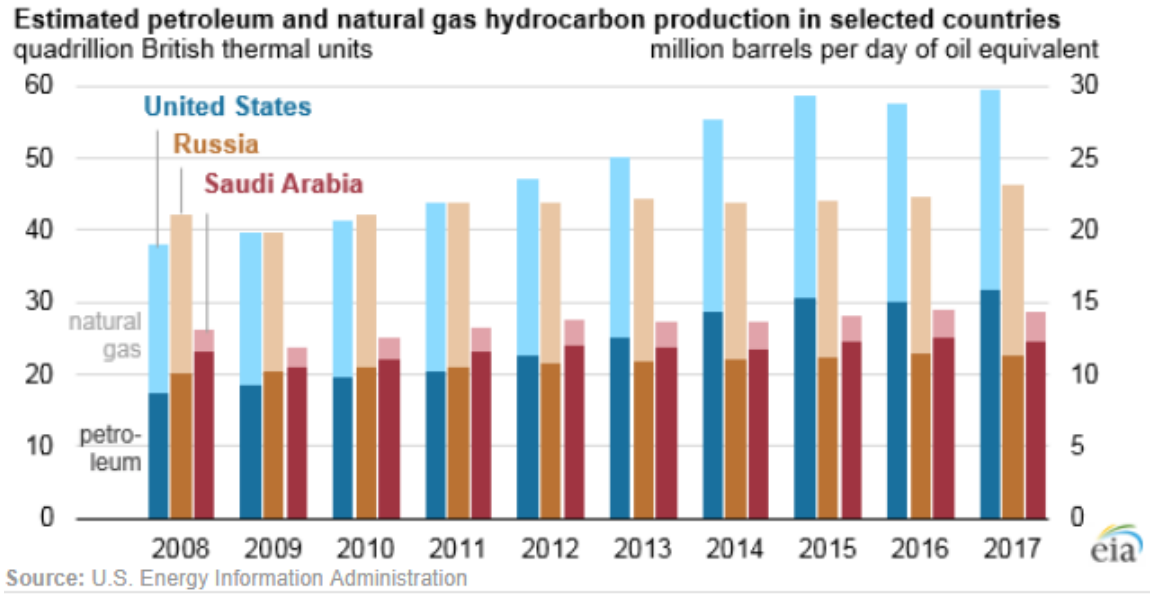

Fig. 2. U.S. production is increasing at a faster rate than Russia and Saudi Arabia production

ISSUES

The following issues may be examined at the hearing:

- The current state of the United States oil and gas sector
- The economic benefits and jobs created by the United States oil and gas sector
- The role and impact of United States energy exports on global oil and gas markets
- The geopolitical benefits associated with increasing levels of domestic oil and gas production.

STAFF CONTACTS

If you have any questions regarding this hearing, please contact Wyatt Ellertson, Brandon Mooney, or Mary Martin of the Committee staff at (202) 225-2927.

[23] See EIA Today in Energy March 13, 2018