



**Statement before the Senate Energy and Natural
Resources Committee**

***“IMPORTING ENERGY, EXPORTING JOBS.
CAN IT BE REVERSED?”***

A Statement by:

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Hearing on “Importing Energy, Exporting Jobs. Can it be Reversed?”
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International Impact of the U.S. Unconventional Oil and Gas Revolution

Madam Chair, Members of the Committee: It is my honor to appear before your Committee today to discuss the important questions you have posed.

My fellow panelists have already described very well the significant impact of the shale gas and tight oil revolution and the long lasting effects on America’s energy supply. Indeed this is the most important development in energy production in the 21st Century so far, driven in part by the equally phenomenal increases in oil prices since the beginning of the century.

I understand the Committee would like me to focus on the international impact of the unconventional oil and gas revolution, particularly in light of the current crisis over Russia’s invasion of Ukraine’s territory of Crimea and the potential threat it poses for gas supply disruptions for Ukraine as well as for Europe, and the possibility for U.S. oil and gas exports to enhance global energy security.

Of course, the international impact of unconventional revolution in North America is just beginning to be felt. Much depends on whether the North American experience can be replicated around the world and how quickly the new technology can be introduced in countries with significant unconventional resource potential like China and Argentina. Numerous studies, including those commissioned by the Energy Information Administration of the Department of Energy (DOE), suggest that similar shale plays exist in different parts of the world. However, even if the geology is similar, the above-ground conditions in most of the world are so different from those in the U.S. that it will take some time, at least another three to five years, before we can know whether and how the American success can be repeated in other countries.

These non-geological conditions, which are somewhat unique for the U.S., include private landholders’ ownership of subsurface mineral rights, a geological data base from a century and half of oil and gas production, a robust and competitive oil and gas industry (especially the presence of small to medium-size, nimble and innovative producers, equipment suppliers, and service companies), existing infrastructure to transport and process production, liberalized market pricing, and well-established and a transparent regulatory environment, which took decades to develop.

Most of these conditions do not exist elsewhere in the world. However, the history of technology transfer makes me optimistic that this technological advancement will be introduced successfully in other countries. It will just take time as it did for our country and longer than some of its eager champions would like. The way it will be implemented may also differ from how it is done in the U.S., but it will be adapted to local conditions.

Nevertheless, tight oil and shale gas developments in the U.S. have already made important contributions to the stability of global energy markets. Thanks to tight oil, U.S. oil production increased by more than two million barrels per day since 2010. This is a remarkable achievement. Without this additional supply, it is difficult to imagine how global oil prices could have remained around \$100 per barrel. Supply disruptions from Libya, Sudan and Iran, as well as underperformance in production in Iraq, Nigeria, and Venezuela were partially offset by the greatest volume increase in the history of oil production in the U.S.

Even before we start exporting liquefied natural gas (LNG) from the lower 48 states, the American shale gas revolution has already made a significant impact on the global LNG market. As recently as 2004, more than 30 LNG regasification terminals were proposed in the U.S. for imports, not exports. The long-term impact of natural gas deregulation under President Carter in 1978 allowed market clearing pricing, unshackled by state and federal controls, to encourage conservation and domestic production. Thirty-five years of stable and predictable regulatory regimes created investment conditions for energy efficiency improvements and innovation in production, such as hydraulic fracturing. Of the 30 some LNG import terminals proposed, only five were actually completed and became operational.

What would the global LNG market be like if the U.S. had become a major LNG importer rather than expected to become a net gas exporter by 2018? LNG from Qatar, West Africa, Trinidad/Tobago and elsewhere, slated for the U.S. market, all became available for Europe and, more importantly, to satisfy increased needs from Japan after the Fukushima disaster and rising import demand by China and India.

When U.S. LNG exports begin by 2016, in addition to adding more global supply, they may also lead to evolution of the global gas market. Because we have gas-on-gas competition in North America, natural gas prices are not linked to oil prices as they are in the rest of the world when gas is traded internationally. The U.S. will become a net gas exporter before the end of this decade. Higher LNG volumes globally, including those from increased production from Australia, potential new production from East Africa, Russia and the Eastern Mediterranean, may contribute to increased spot LNG cargoes that are not tied to long-term contracts with strict volume commitments by both buyers and sellers.

In time, the LNG market may look more like the more liquid and flexible international oil market. However, this will take some time to develop, particularly since the new liquefaction projects are high-cost, demanding tens of billions of dollars in investment,

which will continue to require long-term contracts from committed, creditworthy buyers and predictable gas pricing or tolling charges in order to secure financing.

An indication of the radical change the shale gas revolution caused in the U.S. is Cheniere Energy's Sabine Pass LNG project. Sabine Pass was completed as a receiving terminal only in 2009 and almost immediately sought to become a bi-directional terminal that can liquefy and export gas as well. It will become the first LNG export terminal in the lower 48 states when it is completed by yearend 2015, a journey of more than five years from conception to completion, which is quick for a multi-billion project in the oil and gas industry. It is not merely governmental approvals, such as those from DOE or the Federal Energy Regulatory Commission (FERC) and local permitting, that take time, but also negotiating purchase agreements with qualified buyers, securing financing, and the standard engineering, procurement, and construction work to build the export terminal.

So far, DOE has granted conditional approvals to six LNG liquefaction and export projects. (Sabine Pass is the only one that also has FERC approval.) The last project, Jordan Cove, received its approval only yesterday morning. In fact, DOE has been remarkably speedy in granting such conditional approvals in the last year or so, as confidence grew on the resource base estimates and recovery rates for shale gas.

The combined capacity of the six projects (9.3 bcf/day or 95 bcma) is higher than the total gas consumption of Germany. The U.S. will truly become a major LNG exporter if all six projects are completed. Another twenty-four export projects are in the queue for DOE approval. Consequently, the potential impact on the global gas market could be even greater. Of course, just because a project is proposed does not mean it will be built, as we discovered with the 30-some LNG receiving terminal proposed not too long ago.

There are ample domestic economic reasons why restrictions on oil and gas exports should be relaxed. With oil, the light sweet crude being produced from shale plays like the Bakken cannot be optimally utilized by our sophisticated refineries, which are configured to process less-expensive heavier sour crudes. The U.S. would maximize the economic benefits of tight oil production by exporting some domestically produced light sweet crudes and condensate while continuing to import heavier and sour grades.

With gas, exports would help to sustain the level of investment in production with market prices that benefit producers and long-term consumers without depressed pricing choking off the expected growth, as has happened in the past. This includes gas consumers who are considering expansion of petrochemical capacity, increased utilization in power generation, and new uses for gas such as in the transportation sector.

These are complicated issues that deserve full debate in Congress, as has already begun. Ever since the end of World War II, the U.S. has championed free trade around the world and its benefits extend equally to oil and gas trade. However, decades of perceived energy scarcity have informed our existing oil and gas export policies and it will take time to reexamine these policies and amend applicable laws for a period of relative

domestic energy abundance. A degree of certainty in investment climate is important when billions of dollars are at stake in projects that take years to complete in order to produce, process, and consume more domestic oil and gas.

Russia's aggression against Ukraine has added a geopolitical and foreign policy dimension to these questions. Some have argued that hastening U.S. approvals of crude oil and LNG exports would have a deterrent effect on further Russian actions and enhance the energy supply security of our allies and trading partners in Europe. Unfortunately, this is unlikely to have much immediate effect.

Russia produces more than 10 million barrels of oil per day and exports about 7 million barrels in crude and petroleum products. No amount of increases in U.S. oil exports, including possible drawdown from the Strategic Petroleum Reserve (at a maximum rate of 4 million barrels per day for 90 days), can replace such large volumes. Russian exports of natural gas are equivalent to twice the combined capacity of the seven DOE-approved U.S. LNG export projects, which may be completed by the end of this decade. Certainly increased exports of oil and gas from the U.S. and other countries would reduce over time the significance of Russian exports, but none of this will happen quickly.

In order to reduce the influence Russia exerts through its oil and gas exports, it is Europe's role that is crucial. Whereas it is true that Europe relies on Russia as its major oil and gas supplier, Russia is even more reliant on the European market as the destination of 80 percent of its oil and gas exports. Oil and gas represent more than 70 percent of Russia's export earnings and more than 50 percent of its federal budget. So, who is more reliant on whom? This has more to do with the exercise of political will rather than of economic leverage.

Europe would do well to focus on the development of indigenous energy resources, including shale gas through hydraulic fracturing (unfortunately the Lithuanian Minister's country is one of the few which has committed to do so), and to fully integrating its gas and electricity networks so that supply can flow more easily to countries vulnerable to cutoffs.

Export of U.S. LNG is not a silver bullet for Europe. In fact, imports of LNG declined significantly in Europe last year as a result of more favorable pricing terms offered by traditional pipeline suppliers such as Norway and Russia, and as an indirect result of American shale gas reducing our imports. Operators of European LNG terminals are hurting financially because of low utilization rates. The future volumes of U.S. LNG are already contractually committed to buyers, mostly in Asia where LNG prices are significantly higher than Europe's. Of course, some of these volumes could be redirected if Europe is willing to pay equally high prices for LNG.

Unlike countries such as Russia that have oil and gas sectors dominated by state-owned and controlled companies, the U.S. Government does not direct commerce and leaves this to private companies operating in a free market, except in times of war and other national emergency. Indeed we have historically taken a stance against the use of energy as a

geopolitical weapon, especially after the Arab oil embargo of 1973. These are principles worth considering before we decide to select politically the countries with which we trade oil and gas rather than through internationally negotiated trade agreements.

Since U.S. exports of oil and natural gas would have no impact on Russia's market position in the short to medium term, there is a danger that inflating the rhetoric on exports would actually embolden Russia, which will recognize this as an empty threat, to act even more recklessly. It can also distract us from the more critical task of shoring up Ukraine economically. Two years ago, I testified before the Europe Subcommittee of the Senate Foreign Relations Committee to warn that for more than twenty years "Ukraine has been on a dangerous path toward energy insecurity, which has accelerated" under the Yanukovych administration and that at this rate "Ukraine (will) become an energy appendage of Russia's."

The situation has only worsened in the intervening two years. Ukraine is truly vulnerable to energy blackmail by Russia because of past leaders, not just Yanukovych, who personally benefited from pervasive corruption in the sector, especially in the gas trade with Russia, that led to wasteful consumption, depressed domestic production, and fed the overreliance on Russia for energy supplies. Ukraine is one of the most natural gas dependent countries in the world, with gas supplying 40 percent of primary energy, 60 percent of which is imported from Russia. Potential economic collapse presents the greatest long-term threat to Ukraine's national unity and its territorial integrity beyond Crimea.

Reverse flows of pipelines from Central and Eastern Europe can supply, at most, less than half of the gas Ukraine currently imports from Russia. They are also worthless in a true supply cutoff by Russia lasting for more than a few weeks, since countries like Poland, Slovakia, Hungary and Romania will then have no gas to spare for export to Ukraine. Ukraine has no LNG receiving terminal and, even if it had the wherewithal to build one, which it does not, it would take at least two years to put a receiving facility in place.

Fortunately more than half of the Russian gas sold to Europe still transits Ukraine and Russia cannot cut off Ukraine without cutting off its European customers, upon whom it depends for revenue (as we learned from the 2006 and 2009 gas crisis). Therefore, unless the security and political situation deteriorates further between the two countries, neither Russia nor Ukraine would precipitate a gas supply cutoff. Unfortunately, the risks have increased in recent days.

Nevertheless, urgent actions are needed to remedy Ukraine's long-term gas supply vulnerability, which also affects Europe. Fortunately, the solutions are well known since Ukrainian and Western experts have recommended sensible reform steps for many years, including two separate studies by the International Energy Agency, most recently in 2012. Almost all of these reform plans were commissioned by the same Ukrainian governments that lacked the political will to implement them.

Especially important is gas price decontrol at the burner tip, as the IMF insists for fiscal and balance of payments reasons, but also at the wellhead to provide incentives to invest in domestic production. Current gas price regulations encourage wasteful consumption and chronic shortage, as well as depress domestic production since domestic gas price is controlled at a small fraction of imported gas price. This also has the intended effect of facilitating widespread corruption in gas trade. This must stop.

All Western financial aid to Ukraine from the U.S., E.U., and international financial institutions (IMF, World Bank, EBRD, EIB) should be conditional on the agreement by the interim government of Ukraine to international monitoring of fundamental reforms of the energy sector and a sufficient share of the Western aid money devoted to funding the implementation of reforms, especially in gas pricing, in order to improve energy efficiency and promote domestic production. Naftogaz, the state oil and gas monopoly, which is at the center of energy corruption in Ukraine, must be completely restructured as soon as possible.

There is no point pretending with the new authorities in Kyiv that there are solutions, absent fundamental reform, to Ukraine's energy supply vulnerability, which hangs like a Sword of Damocles over it and Europe because of Ukraine's central position in energy transit. If the Ukrainian government commits to such reforms, the U.S. and E.U. must assist in capacity building for proper execution of reforms steps by providing teams of technical, financial, business and regulatory experts to help.

Frankly, \$1 billion in loan guarantees is not sufficient to the challenge at hand if the U.S. is serious about helping Ukraine's long-delayed transition into a market economy, including modernizing its energy sector. Ukraine's long-suffering public also has to be prepared for the short-term pain energy reform will bring in order to reap its long-term benefits. This will not be easy.

Ukraine's geological endowment for producing more oil and gas is well known. The fastest way of tapping into this potential is to revive its conventional oil and gas production, which has stagnated for more than twenty years in spite of high imported prices, by deregulating wellhead prices as the U.S. did more than thirty years ago. With liberalized pricing, Ukraine may even lead the rest of Europe in replicating American success in shale gas, as it appears similarly well endowed in potential shale plays and major international oil companies seem interested to invest under the right conditions. That would be the best and most realistic way for America's unconventional oil and gas revolution to contribute to the future of European energy security.