



LNG: To export or not to export, that is the question

By William Krist and Dani Litovsky

Woodrow Wilson International Center for Scholars

The U.S. is rapidly moving from being dependent on imported fossil fuels to becoming a major world producer. In addition to our oil and coal, we're sitting on vast supplies of natural gas, and technological innovations have made it possible to tap previously unattainable resources. So what should we do with these new-found riches?

Producers of natural gas, by and large, want to be able to sell where they can get the best price, and often that will mean selling overseas. Some consumers oppose exporting our natural gas, arguing that keeping these supplies to ourselves will keep the price here in the U.S. lower than the world price, which would provide a competitive advantage to our manufacturers who use natural gas either directly or indirectly. And some environmentalists oppose exports because they believe this would raise the price of natural gas and thereby encourage more production at the expense of renewable energy, such as wind and solar.

Current U.S. policy is to make exporting natural gas difficult. Companies wanting to export natural gas have to apply to the U.S. Department of Energy (DOE), as required by the Natural Gas Act of 1938. DOE then conducts an analysis of the impact of the proposed exports on our economy, our trade balance, the environment, and so forth. Proposed exports to one of the 20 countries with which we have a free trade agreement are assumed to be in the national interest and are approved, but proposed exports to all the countries with which we do not have a free trade agreement are a different issue. In fact, of the dozen requests to export liquid natural gas (LNG) to a non-FTA country to date, DOE has only approved one.

This has never been much of an issue because we didn't have very much natural gas until the technology known as fracking was developed. But now we are becoming a major producer of natural gas and as a result whether to export or not has become an issue.

The New Technology

The technology that has made natural gas in the U.S. abundant is to extract natural gas through a process termed hydraulic fracturing, or fracking, which uses a mixture of water, sand, and a small percent of chemicals (which are one of the subjects of the environmental debate) under high pressure to crack shale rock and release natural gas. This process has been made less environmentally hazardous, faster, and cheaper through recent development of horizontal drilling, which consolidates wells into a small area, reducing surface presence by requiring fewer access roads and pipelines. (Conventional drilling uses wells that are spread out, which are tapped vertically, while horizontal drilling uses one large pipe drilled vertically with multiple horizontal pipes branching out.)¹

This technology has created a boom in the natural gas sector. U.S. natural gas production increased 21 percent between 2011 and 2012 and the future looks even more promising. The

William Krist's book "Globalization and America's Trade Agreements" is expected to be published in the fall of 2013.



U.S. Energy Information Administration (EIA) estimates that U.S. natural gas production will increase from 23 trillion cubic feet in 2011 to 33.1 trillion cubic feet in 2040.

Natural gas is shipped either through pipelines or cooled to some -260 degrees Fahrenheit and shipped as liquefied natural gas (LNG). Almost all exports are liquefied natural gas, while domestic shipments generally go through pipelines.

Economic Impact of Exporting LNG

The price of LNG has fallen dramatically in the U.S. as our production has ramped up. The U.S. Energy Information Administration (EIA) reports that the average price per thousand cubic feet of natural gas has fallen from \$6.25 in 2007 and \$7.97 in 2008 to just \$2.66 in 2012.² These low prices are leading to increased domestic consumption, as economic theory would predict. For example, EIA reports that the electric power industry consumed 12.5% less coal in the year ended December 2012 from the previous year, while consumption of natural gas increased 21.4%.³

Allowing the export of LNG would have an impact on its price, both in the U.S. market and in world markets. If the U.S. exports some of our LNG, prices in the U.S. market would be higher than if we retained all of our production for the domestic market, and world prices would be lower. The Department of Energy pinpoints five sectors that are energy intensive and use natural gas:⁴ paper, chemicals, glass, cement and primary metal manufacturing. - would particularly benefit in global competition if they could use lower cost LNG than their competitors in other countries.

While U.S. production is increasing, we still import some one percent of our natural gas consumption; however, projections are that we could become a net exporter by 2016. Transportation costs for shipping LNG to markets in Europe and Asia are significant, but because our cost of natural gas is so far below the cost in most other markets, the U.S. could profitably export LNG. The American Gas Association estimates that in ten years we could export three to four percent of our production.

Proponents of allowing LNG exports argue that higher prices will have a positive impact of generating increased U.S. production. At this time, very low LNG prices may be discouraging investments in the industry, whereas higher prices would provide greater incentive for investing in extraction and liquefying our natural gas resources.

A report commissioned by the Department of Energy conducted by NERA Economic Consulting estimates that U.S. prices would only rise by \$0.22 to \$1.11 after five years of growing exports. NERA projects that the U.S. will experience a net gain in economic benefits from exports, and that firms involved in extraction and production of LNG would gain. Industries that use natural gas would experience some loss, but “in no scenario is the shift in employment out of any industry projected to be larger than normal rates of turnover of employees in those industries.”

William Krist’s book “Globalization and America’s Trade Agreements” is expected to be published in the fall of 2013.

The one project that has been approved to date is the Cheniere Energy project in Louisiana, which uses natural gas from the nearby hub of gas pipelines called Henry Hub,⁵ and converts this into LNG to be sold in various countries including the UK, Korea and India. Cheniere's facility at present uses imported natural gas; total investment at the facility may exceed \$12 billion. Some 23 other applications to export are currently waiting in the wings for DOE approval, and some of these have been waiting two years or more.

Opponents of allowing exports argue that if these applications are approved, prices in the U.S. will rise dramatically. A study by Charles River Associates prepared for The Dow Chemical Company projects that prices in the U.S. "will almost double from \$3.3/MMBtu today to \$6.3/MMBtu by 2030" due to increased demand in the U.S. "Layering in additional demand from LNG exports in the Likely and High Export scenarios would raise prices to \$8.8/MMBtu and \$10.3/MMBtu in 2030, respectively."⁶

Proponents of allowing exports argue that the impact on U.S. prices would not be great. In a March 7, 2013 presentation at the National Press Club, Alan Dunn argued that "timing, prices, international competition, and other economic considerations are likely to prevent most of the projects seeking export authorization from ever building out the substantial plant and equipment necessary to export gas."⁷

Environmental Impact

Natural gas is a cleaner fuel than oil or coal. For example, the U.S. Environmental Protection Agency reports that "compared to the average air emissions from coal-fired generation, natural gas produces half as much carbon dioxide, less than a third as much nitrogen oxides, and one percent as much sulfur oxides at the power plant."⁸

Extraction and shipment of natural gas, of course, has an additional environmental impact to the impact of its usage. For example, the Sierra Club is concerned with the possible contamination of groundwater sources, the inappropriate disposal of wastewater, air pollution, and community impact resulting from natural gas extraction.⁹ However, the environmental impact of extraction and shipment of oil or coal is as great as extraction and shipment of natural gas. In any case, these impacts can be reduced by good regulations, although not fully eliminated.

While better environmentally than oil and coal, natural gas has more of an impact than renewable energy sources such as wind and solar. The Sierra Club worries that encouraging natural gas production by allowing exports could decrease the interest and funding for developing renewable energy.

However, renewable energy sources will not be able to meet the demand for energy for at least the next decade, and the U.S. and other countries will have to primarily rely on natural gas or other fossil fuels in the meantime. Given the more favorable environmental footprint of natural gas, the appropriate strategy would be to use more natural gas for the next ten years, while continuing to improve the economics of renewable energy sources. When renewable energy sources become more competitive and available, then usage of all fossil fuels can be scaled back;

William Krist's book "Globalization and America's Trade Agreements" is expected to be published in the fall of 2013.

in the meantime, the environment will benefit from greater usage of natural gas and less reliance on oil and coal.

Trade Policy Implications

U.S. restrictions on the exportation of natural gas would almost certainly run afoul of international trade rules. Article XI.1 of the World Trade Agreement states “No prohibitions or restrictions other than duties, taxes or other charges, whether made effective through quotas . . . or export licenses or other measures, shall be instituted or maintained by any contracting party . . . on the exportation or sale for export of any product destined for the territory of any other contracting party.”¹⁰ There are some exceptions allowed to this requirement, but none of these would be applicable to our situation. For example we would be allowed to restrict exports but only if similar restrictions were imposed on domestic production and consumption.

Other country export restrictions have caused the U.S. and other countries real economic harm. For example, China imposed export restrictions on rare minerals such as bauxite, coke, fluorspar, magnesium and others. While China argued this was done for environmental reasons, most observers believed it was intended to gain a commercial advantage at its trade partners’ expense. In 2009 the U.S., joined by the European Communities and others, filed a complaint with the World Trade Organization (WTO) regarding China’s export restrictions, and a dispute settlement panel ruled in favor of the U.S. If the U.S. now imposes export restraints of our own to gain a commercial advantage we will undermine our ability to remove similar restraints by other countries.

However, WTO rules do permit countries to maintain licensing systems, such as the U.S. requirement for DOE approval for export of natural gas, provided these systems do not favor domestic users over consumers in other WTO members or some WTO members over others. The rules also require that delays in issuing licenses must not operate as a trade restriction. A WTO dispute settlement panel would almost certainly find that the long delays by the Department of Energy in processing applications would be a violation of Article XI.

The bottom line is that we can maintain our licensing system provided DOE issued approvals within a month or two. This would allow DOE to monitor the situation as we gain a better understanding of the economic and environmental impacts without violating our international obligations.

Conclusion

From an economic perspective, allowing exports of LNG would lead to some increase in domestic prices, and this would encourage greater U.S. production. However, the price of natural gas in the U.S. is substantially lower than in many other markets and even with these increases prices in the U.S. would still be lower than in most other markets given the cost of transportation. Accordingly, U.S. manufacturers that use natural gas will continue to have a cost advantage even with U.S. LNG exports.

William Krist’s book “Globalization and America’s Trade Agreements” is expected to be published in the fall of 2013.



From an environmental perspective, natural gas is less polluting than other fossil fuels. Until renewable energy such as wind and solar can meet the world's energy needs – a prospect that is likely to be at least a decade away - encouraging the use of natural gas probably has a positive environmental impact.

In short, the economic impact of allowing natural gas exports is likely to be small, as is the environmental impact. So maybe this debate is really “*much ado about nothing.*”

¹ The web site “EnergyFromShale” has a good explanation of fracking and horizontal drilling. (Available at <http://www.energyfromshale.org/>, accessed March 12, 2013.)

² U.S. Department of Energy, Energy Information Administration, available at http://www.eia.gov/naturalgas/monthly/pdf/table_03.pdf (accessed March 12, 2013).

³ U.S. Department of Energy, Energy Information Administration, available at <http://www.eia.gov/electricity/monthly/pdf/epm.pdf> (accessed March 14, 2013).

⁴ Report to the Department of Energy by NERA Economic Consulting, dated December 3, 2012, available at http://www.fossil.energy.gov/programs/gasregulation/reports/nera_lng_report.pdf (accessed March 12, 2013)

⁵ A description of Cheniere's project is available at http://www.cheniere.com/lng_industry/sabine_pass_liquefaction.shtml, accessed March 12, 2013.

⁶ “US Manufacturing and LNG Exports: Economic Contributions to the US Economy and Impacts on US Natural Gas Prices.” Washington DC: Charles River Associates, February 25, 2013, page 55.

⁷ Alan Dunn, “Trade in Natural Gas: The Resource, The Law & The Choices.” Presentation to the Global Business Dialogue Event at the National Press Club, March 7, 2013.

⁸ U.S. Environmental Protection Agency, available at <http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.htm> (accessed March 12, 2012).

⁹ Segall, Craig, Staff Attorney, Sierra Club Environmental Law Program. *Look Before the LNG Leap*. Washington, DC: Sierra Club. Report is available at <http://www.sierraclub.org/naturalgas/downloads/LOOK-BEFORE-YOU-LEAP.pdf>, accessed March 12, 2013.

¹⁰ Legal Text of the World Trade Organization agreements is available at: http://www.wto.org/english/docs_e/legal_e/legal_e.htm (accessed March 5, 2013)