

Will Renegotiating NAFTA Threaten U.S. Natural Gas Exports to Mexico?

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See footnote at end of text.

Trade between the U.S. and Mexico is one of the great success stories of the world economy. More than \$1.25 billion of goods and services cross the border each day per Export.gov. Mexico is second only to Canada in energy trade with the United States. Based on the latest annual data from the U.S. Census Bureau, energy accounted for about 9% of all U.S. exports to Mexico and 3% of all U.S. imports from Mexico in 2016. However, U.S. natural gas exports are a late comer. That all started to change in 2013, when Mexico announced significant energy reforms. Today, the U.S. is exporting about 4.1 Bcf/d of natural gas to Mexico valued at \$11.7 million per day.¹ U.S. exports to Mexico are expected to double by 2030, driven by rising industrial and power generation demand, and a 50% decline in domestic gas production in Mexico.

With the new Trump Administration threatening to either renegotiate or tear up NAFTA, severe

economic and environmental consequences may be in store for both Mexico and the U.S. Without NAFTA, there is a possibility that both the U.S. and Mexico will institute tariffs on cross border natural gas sales and purchases with some as high as 25%. The effect would be a significant reduction of U.S. natural gas exports to Mexico and disrupt what is fast becoming a significant energy supply chain.

Energy reform in Mexico is already a politically divisive policy. Increasing tariffs on natural gas or a trade war could threaten the reduction of electricity prices and greening of the Mexican power sector promised by the energy reforms. Although nothing has been done so far, the rhetoric of the Trump Administration, which focuses on job losses, U.S. companies moving operations to Mexico, and immigration issues has caused the Mexican gov-

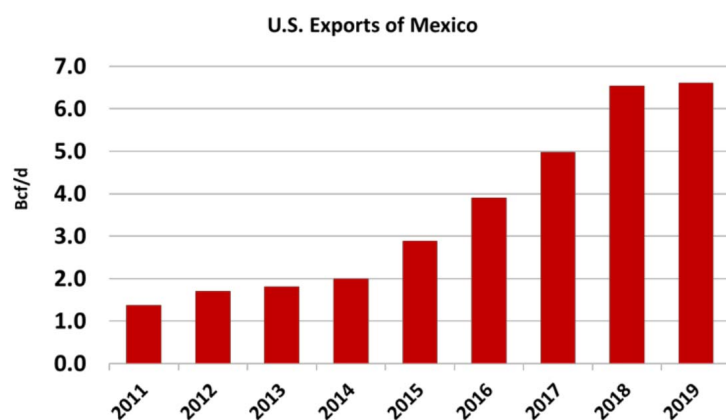


Figure 1. U.S. Natural Gas Pipeline Exports to Mexico

Source: U.S. Energy Information Administration

ernment to rethink its dependence on U.S. trade. Mexico has already begun to explore new partners, notably China and India.

Given the uncertainty of what Mexico and the U.S. will do with respect to NAFTA, I speculate on several scenarios that policy makers, investors and energy companies should be considering. I also describe the economic and environmental risks for both governments and companies trying to take advantage of the U.S. Shale Revolution and Natural Gas and Electricity Reforms in Mexico.

WHAT'S AT STAKE

It took 19 years after the North American Free Trade Agreement (NAFTA) took effect on January 1, 1994 for Mexico to pass legislation to reform its energy sector in 2013. Much earlier energy deregulation in both the U.S. and Canada had taken place. Thus, NAFTA only served to facilitate and encourage greater trade in natural gas, petroleum, and electricity between the U.S. and Canada, resulting in a well interconnected energy supply chain.

U.S. Natural Gas Infrastructure Investments

With plentiful and relatively inexpensive natural gas from the U.S., Mexico has committed to restructuring its natural gas and power sectors, reducing its electricity costs and greening its power sector. Growing U.S. exports to Mexico by cross border pipelines now average 4.0 Bcf/d (billion cubic feet per day) on February 15, 2017 and may double in the next few years assuming nothing changes. In contrast, U.S. LNG (liquefied natural gas) exports are currently 1.2 Bcf/d, but expected to grow to 3.2 Bcf/d in less than three years.

Natural gas pipeline companies in the U.S. with the support of producers are replumbing the existing natural gas pipeline system to meet Mexican demand for natural gas. The replumbing amounts

to reversing pipeline flows on existing pipelines that have traditionally flowed south from the Gulf of Mexico to markets in the Northeast and Midwest and in some cases the pipelines may be bi-directional. The costs of four of the largest reversal pipeline projects in Figure 2 is about \$1 billion.

Now with abundant and inexpensive natural gas from the Marcellus and Utica shales in Pennsylvania, Ohio and West Virginia, the priority is to move Appalachian gas south to Louisiana and Texas and then to Mexico or abroad via LNG vessels. In less than three years, five new interstate natural gas pipeline projects in the U.S. are being developed to deliver up to 8.0 Bcf/d to Mexico. In addition, pipeline companies in Texas are implementing five intrastate and LNG header projects and 6 projects to bring gas to and across the Mexican border. During the same timeframe, 3.2 Bcf/d of new LNG export capacity will be online from the Sabine Pass, Freeport, Corpus Christi in Texas and Cameron, Louisiana by 2018. In addition, five intrastate and LNG header projects, and 6 projects to bring gas to and across the Mexico border are also being developed.

Mexican Natural Gas Infrastructure Investments

Mexico hopes to attain the success and transformation of its natural gas and electric power sectors and the environmental benefits that were realized by the U.S. Abundant and inexpensive natural gas and a restructured U.S. natural gas pipeline system were instrumental in achieving that goal and continue to provide benefits currently. The U.S. Energy Information Administration database showed that inexpensive natural gas displaced 200 million tons of coal annually in U.S. power plants. Largely due to natural gas power burn, U.S. annual carbon dioxide emissions fell by 725 billion tons from 2007 to 2012 according to the Global Carbon Database. The decline was equivalent to total emissions from Germany.

Cenagas (Centro Nacional de Control del Gas Natural), Mexico’s new and independent natural gas pipeline operator is expanding the natural gas pipeline infrastructure and making improvements to existing gas pipelines to take advantage of the U.S. Shale Revolution. Created in 2014, Cenagas’ dual role reflects the restructure U.S. natural gas pipeline industry that occurred in the U.S. in the 1980s under the Federal Energy Regulatory Commission. However, Cenagas not only operates the pipeline and storage systems, but is also a shipper of natural gas.

Cenagas’ existing pipeline system is nearly 5,592-miles long and formerly operated by PEMEX (Petróleos Mexicanos). Cenagas’ 5-year plan calls for spending \$4.6 billion on 12 additional natural gas pipelines and a compressor station. The projects would be operational in 2018 and add 1,926 miles to its pipeline system. By the end of 2017, Mexico’s energy ministry expects pipeline supply to account for all natural gas imports as a series of new pipelines start operations and the Los Ramones Phase 2 South reaches full capacity following maintenance work.

Mexican Electricity Investments

Cenagas’ natural gas pipeline investments are modest when compared to those planned to modernize Mexico’s electric sector. On August 11, 2014, Mexico’s current President Enrique Peña Nieto signed additional legislation opening both the oil, gas and

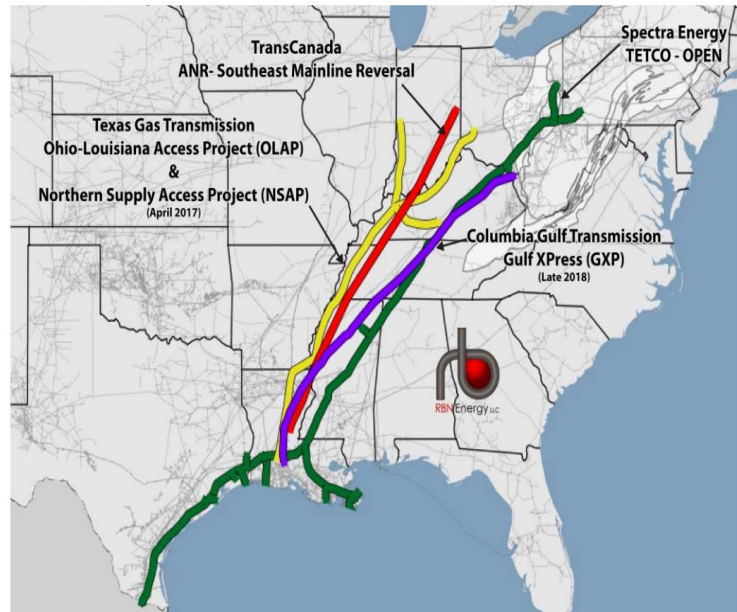


Figure 2. Major Pipeline Reversals bring Marcellus Gas to U.S. Gulf Coast for Export

Source: RBN Energy



Figure 3. Existing and Proposed Natural Gas Pipelines and LNG facilities in Mexico

Source: U.S. Energy Information Administration

electricity sectors to private investment. Mexico's demand for gas has been rising primarily, because of an ongoing effort by the state-owned Comisión Federal de Electricidad (CFE) to expand and modernize its power generation fleet by building thousands of MW of new, gas-fired combined-cycle power

plants. Virtually these new power plants need new gas supply, with most of it planned to come from the U.S. via new natural gas pipelines.

Mexico wants to increase its electric capacity from 68,044 MW (megawatt) in 2015 to 109,367 MW in 2030 or by buy 61%. This will require an investment of over \$131.6 billion. The 41,323 MW needed to reach the total capacity of 109,367 MW means that more than 40 power plants with 900 MW capacity will need to be built. Many of these the power plants will be gas-fired combined cycle plants and which will be heavily dependent o Parag.Nathaney@icf.com n a well-integrated natural gas pipeline system that can reliably deliver natural gas at a competitive price.

Current Mexican electric power generation is high cost, with large concentration of fuel oil- and diesel-fired power plants, followed by coal, nuclear and

offset by low-cost hydropower. Gas fired power generation made up 54% of Mexico's power generating portfolio in 2015. SENER (Secretaría de Energía de México) estimates that more than 60% of Mexico's electric capacity additions will come from combined-cycle gas turbine (CCGT) generation between 2016 and 2020. Plans to gradually retire inefficient oil and diesel-fired power plants should provide downward pressure on electricity rates and improve air quality as well.

SCENARIO AND OUTCOMES

This section looks at a few scenarios that could affect the U.S. natural gas exports to Mexico:

1. NAFTA renegotiations fail,
2. The U.S. withdraws from NAFTA,
3. Imposition of tariffs by Mexico and the U.S.
4. U.S. immigration bans result in increased deportation of Mexican citizens,
5. Inflammatory rhetoric by the Administration increases (Mexico will pay for the Wall),
6. Growing populist sentiment in Mexico and the election of [name the guy] in Mexico's 2018 presidential election

Outcome 1- The big winner here could be Canada

NAFTA's Article 2205 states that a party may withdraw from the agreement six months after it provides written notice. Article 2205 also states that withdrawal of one [party] *does not affect the remaining two countries*. Hence, if the U.S. withdrew from NAFTA then Mexico and Canada would be free to carry on trade without the U.S.

Canada has abundant natural gas production and it may find itself in an enviable position if it could export natural gas into Mexico. Fortunately, the interconnected 305,000+-mile natural gas pipeline system in North American may enable Canadian producers to reach Mexican markets via flowing the gas and/or by displacement (backhaul). The latter is due to the fungibility of natural gas, since Canadian molecules are indistinguishable from U.S. molecules and meet natural gas industry standards of 1,032 Btu per cubic feet. How the U.S. Customs and Border Patrol would view such trade is another matter. The U.S. may impose a tariff on such natural gas entering Mexico if they don't recognize the transaction as originating in Canada and transporting Canadian natural gas.

Some free trade analysts believe also that if the U.S. withdraws from NAFTA then the former Fair Trade Agreement (FTB) between the U.S. and Canada would automatically be resurrected. That is debatable but a possibility, because the FTB fell into disuse when NAFTA was signed.

Other beneficiaries of the failure to successfully renegotiate NAFTA or a break down in trade between the U.S. and Mexico could be LNG exporters from Peru, Nigeria and Trinidad and Tobago. Mexico has two LNG Import Terminals that have received major cargoes in the last two years—Manzanillo on the Pacific coast and Altamira on the Gulf coast. Manzanillo is Mexico's most active LNG terminal, receiving cargoes

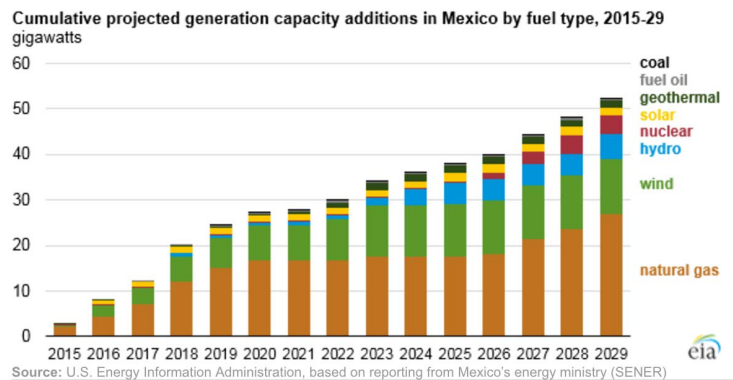


Figure 4. Natural gas-fired power plants lead electric capacity additions in Mexico

Source: U.S. Energy Information Administration and SENER (Secretaría de Energía de México)

from Peru under a long-term contract with Mexican state-owned utility CFE. Although LNG imports into Mexico have declined in the last two years as cross border pipeline projects like NET Mexico could source gas from South Texas, a decline in pipeline imports from the U.S. or Canada could be bullish for LNG exports to Mexico from other countries, even though LNG is more expensive.

Outcome 2- Mexico decides to develop its own shale gas resources

Mexico’s growing dependence on the U.S. for natural gas is tied in part to challenges that Petr6leos Mexicanos (Pemex), Mexico’s state-owned oil and gas company, has faced in maintaining its own production levels. Mexico has vast potential gas production in the Burgos shale region in northeastern Mexico (just south of Texas’ Eagle Ford). Any development of these shales would require Mexico to invest in natural gas processing plants and natural gas liquids (NGL) facilities and pipeline take away capacity. The government could also emphasize foreign investment in shale gas production, and downstream gas processing and NGL facilities.

This outcome is even more likely if populist Andres Manuel Lopez Obrador is elected president in the 2018 Mexican elections. Often referred to as AMLO, he has twice run for Mexico’s presidency, losing narrowly in 2006 and again by 6 points to Peña Nieto in 2012 — and he’s set to run again in 2018. AMLO has railed against Mexican energy reforms, the most polarizing of which opened the country’s oil industry to private investment. Even if a pro energy reform President is elected, populist feelings in Mexico and national honor, may force Mexican leaders to look closely at becoming self-sufficient in natural gas production rather than relying on less expensive U.S. natural gas.

Outcome 3- Mexican Electricity Reform Efforts could be much more expensive.

Mexico’s plan to build gas-fired power generating plants would be faced with the prospect of higher cost natural gas. In the absence of U.S. natural gas transported via pipeline, the make-up gas would have to come from Canada via the U.S. natural gas pipeline system and/or LNG imports. Fortunately, Mexico has two LNG Import Terminals that have received major cargos in the last two years—Manzanillo on the Pacific coast and Altamira on the Gulf coast. However, landing prices of LNG at Altamira LNG Import Terminal in December 2016 were nearly three times the average South Texas Regional Daily Price Index Price of \$2.79/MMBtu (see footnote 2 and Figure 3 and comparable at Manzanilla.)

Mexico’s energy reforms are considered by many to be too expensive and have suffered recent setbacks when the price of gasoline increased. If Mexico and the U.S. exempt natural gas trade from any renegotiation, then the electricity reforms will in time reflect decreased electricity costs. However, Mexico may decide not to go forward with some gas-fired power generation if renegotiation of the NAFTA does not result in abundant U.S. natural gas supplies at prices comparable to South Texas regional prices. As we mentioned in Outcome 1, if Canada can successfully flow gas through the U.S. pipeline system at lower prices than LNG, then this could mitigate the higher LNG prices at Altamira and Manzanilla.

Outcome 4- The Environment may be the biggest loser.

In response to higher natural gas prices, Mexico will continue and most likely extend the economic life of the existing oil-fired and coal-fired power generation fleet. This will result in increased use of fuel oil and coal, at the expense of clean air quality afforded by burning natural gas. Hence, Mexico’s

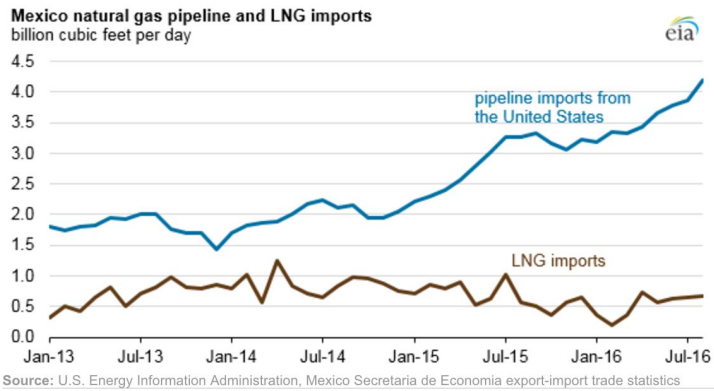


Figure 5. Pipeline Imports from the U.S. displacing LNG imports to Mexico



Figure 6. Selected World Liquefied Natural Gas Landed Prices for December 2016
Source: FERC and Waterborne Energy Inc.

electric power sector not attain the air quality benefits realized by the U.S. Shale Gas Revolution nor use natural gas as a “bridge fuel.” Even if Mexico installs more renewable energy, it will have to rely on some gas-fired power generation to follow electric load and any installed wind and solar power generation. However, gas-fired power generation may not be needed if utility-scale electric storage projects gain traction and become a mainstream technology in areas like California.

Outcome 5- The success of natural gas pipeline investments will depend largely on LNG exports to recoup costs.

If U.S. natural gas pipeline flows into Mexico are reduced, because of tariffs imposed by either Mexico or the U.S., then those investments will have to rely solely on increased LNG exports to balance natural gas supply. Failing that, U.S. natural gas producers may constrain production to balance the market. Most of the interstate pipeline reversals can probably whether the storm, however, if gas does not flow to Mexico through the numerous cross border pipelines and intrastate pipelines, those investments may be unprofitable and stranded.

Footnote

¹ 4.2 Bcf/d of natural gas valued at \$2.79/MMBtu at Natural Gas Intelligence South Texas Regional Daily Price Index Price on February 15, 2017.

Hastings (continued from page 9)

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