



Will NAFTA Renegotiation Stop Greening of Mexico's Power Sector?

Thomas N. Russo

[We welcome Thomas N. Russo as an Energy and the Environment columnist—Ed.]

While NAFTA was signed in 1970, it wasn't until Mexico announced energy reforms in 2013 that US and Mexican energy trade increased. Today, the United States is exporting about 4.1 billion cubic feet per day of natural gas to Mexico valued at \$11.7 million per day.¹ US natural gas exports to Mexico are expected to double by 2030, driven by rising industrial and power generation demand and a 50 percent decline in domestic gas production in Mexico. See **Exhibit 1**.

Natural gas exports to Mexico are expected to double by 2030.

MEXICO'S ENERGY REFORMS IMITATE THOSE IN UNITED STATES

If the Trump administration's efforts to renegotiate NAFTA fail, then economic and environmental consequences may result for both countries.

Mexico's energy reform depends on natural gas via cross-border pipelines to transform its power sector. Mexico wants to increase its electric capacity

Thomas N. Russo (tom@russoonenergy.com) is president of Russo on Energy LLC. Russo on Energy formed a strategic alliance with Kleinschmidt Associates to strengthen its natural gas, oil, power, and environmental services offerings.

from 68,044 megawatts in 2015 to 109,367 megawatts in 2030, or by 61 percent. This increase will require an investment of over \$131.6 billion.

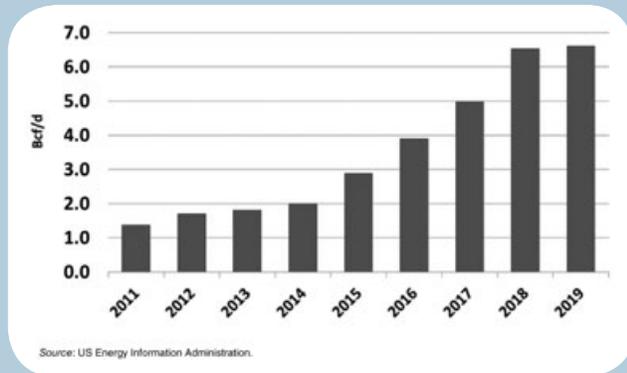
The 41,323 megawatts needed to reach the total capacity of 109,367 megawatts means that more than 40 power plants with 900-megawatt capacity will need to be built. Many of these power plants will be gas-fired combined-cycle plants that need a reliable natural gas pipeline system. See **Exhibit 2**.

By the end of 2017, Mexico's energy ministry expects pipeline supply to account for all natural gas imports and virtually replace more-expensive liquefied natural gas (LNG) imports from its terminals at Altamira and Manzanillo on the east and west coasts. Cenagas (Centro Nacional de Control del Gas Natural), Mexico's new and independent natural gas pipeline operator is expanding the country's natural gas pipeline infrastructure and making improvements to existing gas pipelines to serve power generators and industrial plants.

By the end of 2017, Mexico's energy ministry expects pipeline supply to account for all natural gas imports and virtually replace more expensive LNG imports.

In contrast, with the support of producers, US natural gas pipeline companies are reversing existing pipelines and expanding some to move gas from the Marcellus and Utica shale regions to the Mid-Atlantic states, Louisiana, and Texas. The primary destinations of this gas are Mexico and overseas markets. Cheniere Energy's Sabine Pass LNG Export Terminal is currently exporting 1.4–2.15

Exhibit 1. US Exports of Mexico



billion cubic feet per day. With the additional LNG trains coming on-line at Sabine Pass and four other LNG projects (Cove Point, Corpus Christi, Freeport, and Cameron), LNG exports are expected to grow to 3.2 billion cubic feet per day by the end of 2018–19. The increased supply of US LNG cargos at competitive prices will encourage even greater fuel-switching from oil-fired power plants worldwide, improve air quality, and reduce CO₂.

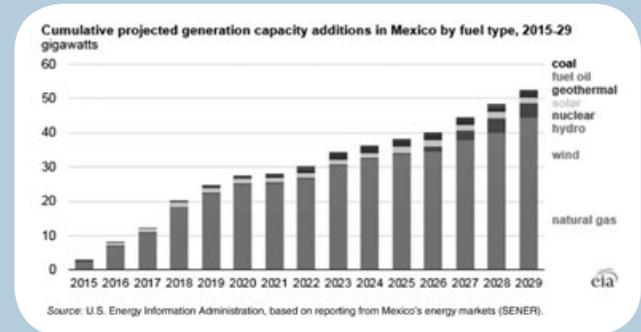
NATURAL GAS IS MORE THAN A BRIDGE FUEL

The Mexican power sector is imitating the US power sector by taking advantage of abundant and inexpensive shale gas. However, Mexico will not incur the environmental impacts of hydraulic fracking—water acquisition, use of chemical additives, pollution from flow-back water, and waste water disposal. The tradeoff is that Mexico will be subject to natural gas price risks and will not develop its own shale gas resources.

Mexico will be subject to natural gas price risks and will not develop its own shale gas resources.

Climate change objectives are deeply entrenched in Mexico's current policymaking, especially in energy reform. While Mexico will be developing renewables, imports of shale gas from the United States are critical to greening the power sector and meeting CO₂ emission goals. Fuel switching in Mexico will play a major role in bringing down overall electricity costs and increasing supply and reliability during the period to 2040. The switch

Exhibit 2. Natural Gas–Fired Power Plants Lead Electric Capacity Additions in Mexico



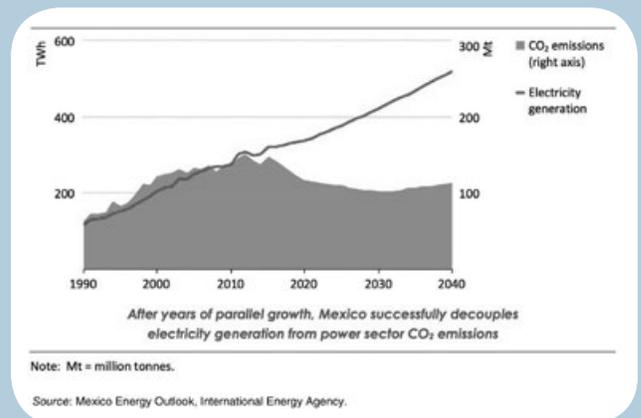
away from oil-fired power generation that uses no. 6 fuel oil and diesel fuel has been underway for some time and is accelerating.

Climate change objectives are deeply entrenched in Mexico's current policymaking, especially in energy reform.

As a result of fuel switching, Mexico has been able to decouple electricity production from power-sector CO₂ emissions. See **Exhibit 3**. This is despite electricity generation increasing by 70 percent under a best-case scenario. Under that scenario, CO₂ emissions related to power generation fall by almost 20 percent by 2040, implying a 52 percent drop in carbon intensity.

In the transport sector, the largest emitter of CO₂ in Mexico, emissions would continue to in-

Exhibit 3. Electricity Generation and Energy-Related CO₂ Emissions, 1990–2040



crease, but at a much more moderate pace. Future reductions of CO₂ levels are anticipated as renewable and energy efficiency projects gain traction. Overall, in later years investments in renewables (solar PV, wind, and hydro) and electric transmission will exceed gas-fired power plant investments by a factor of 2.5. Even then, natural gas will play a role in reforming the sector and reducing CO₂ emissions, because Mexico defined gas-fired cogeneration facilities as a renewable resource. See **Exhibit 4**.

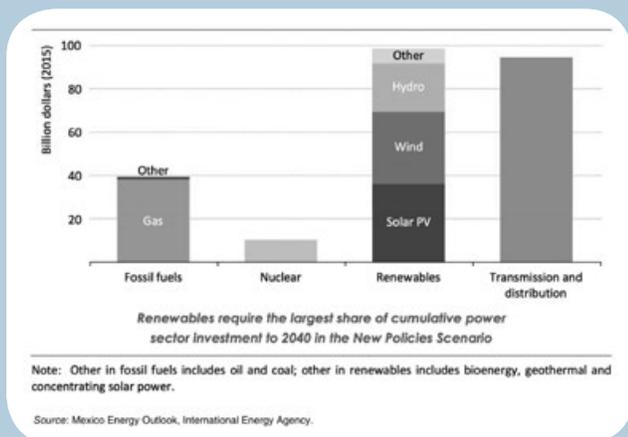
Mexico defined gas-fired cogeneration facilities as a renewable resource.

NAFTA RENEGOTIATIONS COULD JEOPARDIZE BENEFITS

NAFTA renegotiations in today's political environment are complicated enough.

However, the upcoming Mexican presidential elections in 2018 and Mexican voters may add additional nonenergy issues in the negotiations. Mexico's citizens have not fully realized the environmental or economic benefits of the government's energy reforms. In addition, candidate and President Donald J. Trump's truculence and disrespect toward Mexico have also benefitted populist Andrés Manuel López Obrador, who will be a candidate for president. López Obrador is no fan of the government's energy reforms and if elected would

Exhibit 4. Cumulative Investment to 2040 in Power Sector in Mexico in the New Policies Scenario



call for a national referendum on whether to continue with the program.

Mexico's current president, Enrique Peña Nieto, and Luis Videgaray, the current secretary of foreign affairs, have been adversely affected by the US rhetoric on NAFTA, immigration, and the wall. President Peña Nieto cannot run again, however, Secretary Videgaray, an ardent supporter of the energy reforms, may be a presidential candidate. The secretary will also be playing a pivotal role in the NAFTA negotiations. He may have less flexibility to negotiate if the United States and Mexico are embroiled in a war of words or if Mexico's national honor is tested.

If NAFTA renegotiations stumble or the United States pulls out of the agreement, the cost of natural gas imported to Mexico could increase. Of course, this assumes Mexico would still import significant, if not slightly lower, volumes of pipeline gas from the United States. The overall effects would slow down reforms in the Mexican power sector and reduce the projections regarding CO₂ emissions. US pipeline companies that have invested in reversals to move Marcellus and Utica shale gas to the border would be adversely affected and have to rely more on LNG export demand to move gas south. Environmentally speaking, the worst that could happen is that Mexico would continue to operate oil-fired power plants, which are the worst polluters in the power sector.

Mexico could also turn to LNG imports from Peru, Nigeria, and Trinidad and Tobago and use its two LNG import terminals to modernize and green its power sector. Other countries, including Canada and China, are also meeting with Mexico to establish better trading relations in the event of a NAFTA rift between the United States and its trading partners. It is conceivable that Canadian gas could be transported to Mexico via the US natural gas pipeline system without incurring higher tariffs.

In addition, US LNG cargoes once loaded FOB Sabine Pass or Cove Point could simply be diverted by the purchaser (e.g., China) to Mexico's Altamira LNG import terminal. Using LNG in lieu of pipeline gas would be costly and probably slow down fuel switching and the associated environmental benefits.

NOTE

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.