Introduction

In December 2013, Mexico amended its Constitution and laid the groundwork for important changes that will transform its energy sector to allow for competition and private participation in areas that were previously reserved to the State. This comprehensive reform program affects all aspects of the Mexican energy sector, from upstream oil and gas activities to midstream pipelines and downstream electricity distribution and sales.

Until now, the energy sector has been dominated by two state-owned companies: Petróleos Mexicanos (Pemex) and Comisión Federal de Electricidad (CFE). Exploration, production, transportation, refining, and distribution of hydrocarbons were reserved to the State, with Pemex as the state-controlled operator. CFE is the national electric utility and its activities were also reserved to the State by law. Private investment was only permitted in natural gas for transportation, storage, distribution, and marketing; and in electricity generation for self-supply, independent power production (with long-term contracts with CFE), and exports.

Under the constitutional reform and secondary legislation, Mexico will open its energy sector to foreign and national private investment throughout the energy supply chain, from exploration, production, and transportation of hydrocarbons, to refining and marketing. In the electricity sector, the reform eliminates barriers for private generation, creates a wholesale market open to private participation, and—in some cases—allows private investment in transmission and distribution.

This historic reform presents important investment opportunities. Just for 2014–2018, Mexico needs MEX.$3.9 billion of investments for energy infrastructure throughout the energy supply chain. Nearly one third may come from private investment. The exact nature of the value proposition for investors will take shape in the near future as the rules that govern the new marketplace are defined and the uncertainties removed. In the meantime, if the reform is to be successful, it will require major efforts and collaboration from all actors in the sector.
The Ongoing Nature of the Reform Process

On 30 April 2014, President Enrique Peña Nieto submitted proposed secondary legislation to Congress to implement the constitutional changes. After long and intense debate sessions, 21 laws were approved by Congress in the first week of August, which were signed by the President and published on 11 August. This secondary legislation consists of nine new laws and amendments to 12 existing laws.

The December 2013 constitutional changes set up the fundamental principles for the energy reform, and the secondary legislation establishes the details and timeline for its implementation. The next step is to build the new regulatory framework; approximately 40 rules and regulations will have to be issued by the Mexican Government to apply the new laws. The President has set October 2014 as the target for this ambitious task.

Figures 1, 2, 3, and 4 illustrate the new industrial organization in the oil products, natural gas and electricity sectors under the reform. As shown, the constitutional amendment creates new entities: a new regulator for licensing, safety, and environmental protection for the hydrocarbons sector; and independent system operators (ISOs) for electricity and for natural gas. It also strengthens Mexico’s energy regulatory authorities: the Energy Regulatory Commission (CRE) and the National Hydrocarbons Commission (CNH).

Figure 1. New Upstream Organization

Source: SENER web page at: http://www.energia.gob.mx/webSener/leyes_secundarias_ing/NmodelExpExt.html
Figure 2. **Midstream and Downstream Oil Products Model**

![Midstream and Downstream Oil Products Model](image1)

Source: SENER webpage at: http://www.energia.gob.mx/webSener/leyes_secundarias_ing/Trans_tranp_alm.html

Figure 3. **Natural Gas Industry**

![Natural Gas Industry](image2)

Source: SENER webpage at: http://www.energia.gob.mx/webSener/leyes_secundarias_ing/Trans_tranp_alm.html
Exploration and Production of Oil and Gas

Mexico is the tenth largest oil producer in the world, but production has been declining since 2004. At its peak, the country produced 3.4 million barrels per day (mmbd), while today it produces approximately 2.4 mmbd. Mexico has significant oil and natural gas reserves (46.8 billion barrels of oil equivalent 3P reserves) and many geographic areas still to explore.

Most of Mexico’s reserves and resources are now in areas unlike those that Pemex has historically exploited. Prospective oil resources reside in deep waters in the Gulf of Mexico. In addition, the US Energy Information Administration estimates 545 trillion cubic feet of unproved wet shale gas among technically recoverable resources, which are among the largest in the world.

Mexico’s natural gas production has been declining, partly as a result of low prices in the region. For example, in 2012 alone, non-associated gas production decreased by 12 percent. Meanwhile, electricity generation has driven demand higher, and some of the increased demand is being met through imports, about two billion cubic feet per day (bcfd). Until now, gas production and processing activities remained a state monopoly.

Under the reform, Pemex will be transformed into a “State Productive Enterprise” that will aim for technical, management, and budgetary autonomy. The reform reaffirms Mexico’s ownership in its underground hydrocarbons and the State’s sovereignty over them. Nevertheless, the reform allows assigning or contracting for the activities of exploration and extraction of petroleum and other hydrocarbons on behalf of the Nation. The reform establishes four different types of contracts for these activities in which the State will compensate its productive enterprises or the private companies:
1. Service contracts;
2. Pay in cash (already used and so far, unattractive to investors);
3. Profit-sharing contracts;
   • pay a percentage of the profit;
   • production-sharing contracts;
   • pay a percentage of obtained production; and,
4. License contracts in which the state receives different compensations (signing bonus, exploration quota, royalties) and the contractor will be compensated with the onerous transmission of hydrocarbons once they have been extracted from the subsoil (sales at the wellhead).

The changes are already happening. In March, Pemex sent to the regulators—National Hydrocarbons Commission (CNH) and Secretaría de Energía (SENER)—the list of areas that it wishes to keep on the so-called “Round Zero.” Pemex has to demonstrate that it has the fiscal and technical ability to develop the resources in those areas and once granted, it must use the area within three years (plus a possible two-year extension) or lose it.

On 13 August, SENER announced the results of the “Round Zero,” one month ahead of the deadline set in the Energy Reform Decree, and awarded Pemex 120 areas (assignments) that give it the right to continue hydrocarbon extraction activities, which together cover 71 percent of domestic oil production and 73 percent of national gas production. In terms of reserves, the fields granted have 68 percent of 1P reserves and 49 percent of 2P reserves of the country. Of the 31 percent of the prospective resources requested by Pemex, it was awarded 21 percent, along with the results of “Round Zero,” SENER announced the early initiation of “Round One.” In this round, the regulator CNH will launch a process to award the JVs for the projects to be migrated by Pemex and will also lead a process through which the acreage not kept by PEMEX will be identified and put up for bid. With the goal of attracting investment, CNH will determine the size and attractiveness of the acreages put out for bid, the clarity of the rules, the specifics of the contracts, the predictability of regulatory decisions, the transparency, and the fiscal terms.

Natural Gas

Natural gas transportation, storage, distribution, and marketing have been open to the private sector since 1995. Infrastructure, however, has not been developed as needed. Natural gas demand in Mexico has grown significantly in the last few years (104 percent from 2002 to 2012). This has been in part, a result of the low natural gas prices at Henry Hub, which was the reference price for the natural gas prices in Mexico. For the same reason, Pemex’s production has decreased since 2008, resulting in an important increase of imported gas. Net imports reached 32 percent of the total supply in 2012.²

Furthermore, since 2012, the pipeline capacity has been insufficient, resulting in shortages. There are major pipelines under construction that will alleviate this problem next year. The most important addition of infrastructure for the next five years is the Ramones pipeline, which will add 2.1 bcf/d of capacity (20 percent of expected demand). Initial capacity will be 1 bcf/d increasing to 2.1 bcf/d by the end of 2015. Pemex owns most of this pipeline through an affiliated company.
Most of the natural gas in Mexico (98 percent) is used by the energy industry (oil and electricity generation) and industrial customers. Residential consumption for natural gas in Mexico is still fairly low. Households use liquefied petroleum gas (propane/butane) instead.

The CRE regulates natural gas and Pemex’s natural gas pipelines, grants permits, and approves the tariffs for natural gas transportation, distribution, and storage systems. CRE will continue to do so after the reform. CRE’s goals will be to ensure efficient infrastructure development, regulate market power, and promote competition.

The reform creates a new independent system operator: National Center for Natural Gas Control (CENAGAS), a decentralized public entity that will manage and operate the National Integrated Natural Gas Transportation and Storage System. CENAGAS will have to guarantee open access to the system and will be in charge of the five-year expansion plan. Pemex has to transfer its pipelines to this new public entity. CFE and Pemex’s affiliates have to transfer their capacity contracts as well. There will be open access and a secondary market for capacity.

**Petroleum Products**

Mexico’s demand for petroleum products has been increasing rapidly. Gasoline and diesel demand has been growing at an average rate of 3.8 percent per year in the last decade. According to SENER, this pace is expected to continue over the next 15 years.

Until now, Pemex Refinación has been the sole provider of petroleum products in Mexico. It imports about half of the gasoline that is consumed in the country. Last year, Pemex Refinación lost Mex.$123 billion (US$9.6 billion).

The current infrastructure could be expanded significantly to serve existing and new demand efficiently. Seventy percent of petroleum products are transported by pipeline, while 14 percent are still transported by trucks. Storage available for Magna gasoline, the most common type, is limited to 3 days.

With the reform, the sector is completely open to private participation. New entrants can build refineries, distribute and store the products, and market them starting in 2015. Free import, with a permit granted by the CRE, will be allowed in 2016 for liquid petroleum gas (LPG) and in 2017 for diesel and gasoline. At the moment Pemex is the sole provider in the whole chain. Gas stations are Pemex’s franchises.

With the reform, SENER will issue permits for refining and processing, while CRE will now regulate petroleum products’ pipelines and storage. The challenge will be to create a competitive sector, starting with a large incumbent that covers the whole territory. CRE will need to establish light-handed regulation that guarantees a level playing field for investors. SENER, CNH, and the Federal Economic Competition Commission (COFECE) can intervene to make Pemex or its affiliates guarantee its activities and operations allow competition and efficient market development.
The Ministry of Finance controls the price of gasoline and the degree of subsidy. Last year, the subsidy amounted to roughly US$9 billion and more than twice that amount in 2012. Decisions on how prices will be set will be key in determining the value proposition for investors, given the Reform. A process to open the market has been established. Starting in 2015 a price cap will be determined by the government before eventually giving way to market pricing: in 2017 for LPG gas and in 2018 for diesel and gasoline.

Electricity

CFE is a vertically-integrated monopoly that supplies electricity to most users in Mexico. Tariffs are set by the Ministry of Finance and are generally considered to be high, even after accounting for residential and agricultural subsidies. According to the government, the average electricity rates are 25 percent higher than those in the United States. As a result of these high rates, some large industrial customers have left CFE and have their own self-supply generation. In the last decade, self-supply grew at an average rate of more than 6 percent per year.

The secondary legislation aims to foster greater competition and private sector participation in the electricity sector by eliminating barriers for private generation, creating a wholesale market, and allowing some forms of private investment on the rest of the electricity chain. CFE will become a “productive state enterprise” with technical, management, and budgetary autonomy and it is divided into different business units. Furthermore, CFE’s Centro Nacional de Control de Energía (CENACE), which is the sole national system operator in charge of all generation dispatch (both CFE and private), will be decentralized and become responsible for operational control of the national electricity system and the to-be-developed wholesale electricity market. In other words, it will be Mexico’s ISO.

The details will be defined in the market rules and regulations. To guarantee private investment and an efficient system, market participants will have to be able to compete under equal circumstances relative to the incumbent and with clear rules.

A challenge will be that CFE owns 64 percent of Mexico’s installed capacity and controls 85 percent (through long-term contracts with IPPs) and there will be no divestitures. The forthcoming laws and regulations should be clear about how a competitive market will be created making sure that CFE does not abuse its market power. This will be a short- and medium-term challenge, however, if new entrants meet the incremental demand, which is growing rapidly. According to official forecast, electricity consumption will almost double in the next 15 years, requiring more than 50 GW of additional capacity. The new law establishes that CFE will be responsible for the tender processes related to new capacity projects included in its 2015 budget.

The transmission and distribution systems also require large investments to guarantee electricity supply in the coming years. It will be necessary to implement economic regulation of the natural monopolies (transmission and distribution). Specifically, CRE will regulate transmission and distribution tariffs. CRE does not have the capability to do this with its current staff and will need to be strengthened to carry out its new duties under the reform.
How wholesale and retail electricity rates will be set is yet to be determined under the new regulations. Of course, investors cannot know the value proposition for potential opportunities in the sector until these rules are clarified.

By law, Mexico has a goal to generate 35 percent of its electricity with clean energy. The government is proposing to have a mechanism similar to Renewable Portfolio Standards with green certificates. The secondary laws and regulations will set out the details on eligible resources, medium-term goals, etc.

**Conclusion**

Mexico’s energy reform is moving forward. Changes have been made to the country’s Constitution and legal framework that will transform the entire Mexican energy sector. These changes present important investment opportunities for foreign and national companies throughout the energy supply chain.
Nera’s Experience in Mexico

NERA has addressed the issues of industry structure, economic regulation, production, transport, and distribution pricing in Mexico. We have a deep understanding of the Mexican energy sector. We have worked for Pemex and CFE, for the government, the regulator, and private energy companies. We have assisted our clients by:

- Designing the trading arrangements for energy, capacity, and ancillary services, and the drafting of the associated codes covering scheduling, dispatch, congestion management, definition of transmission rights, treatment of transmission losses, settlements, metering billing, etc.;
- Modelling competitive markets for the purpose of identifying market power and recommending an optimal split of generating assets into companies to be spun-off;
- Assisting with development of transmission policy, including the determination of incentives for long-term private investment in transmission;
- Designing electricity transmission and distribution tariffs and subsidy design;
- Designing terms and conditions for natural gas transport;
- Assisting with the calculation of natural gas distribution tariffs;
- Analyzing potential regulatory frameworks for the LPG industry and tariffs for LPG terminals; and,
- Evaluating investment opportunities.

Notes

About NERA

NERA Economic Consulting (www.nera.com) is a global firm of experts dedicated to applying economic, finance, and quantitative principles to complex business and legal challenges. For over half a century, NERA’s economists have been creating strategies, studies, reports, expert testimony, and policy recommendations for government authorities and the world’s leading law firms and corporations. We bring academic rigor, objectivity, and real world industry experience to bear on issues arising from competition, regulation, public policy, strategy, finance, and litigation.

NERA’s clients value our ability to apply and communicate state-of-the-art approaches clearly and convincingly, our commitment to deliver unbiased findings, and our reputation for quality and independence. Our clients rely on the integrity and skills of our unparalleled team of economists and other experts backed by the resources and reliability of one of the world’s largest economic consultancies. With its main office in New York City, NERA serves clients from more than 25 offices across North America, Europe, and Asia Pacific.

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