


A Look at the Future of the Mexican Petroleum Industry after Energy Reform

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Executive Summary

The 2013 Constitutional Reform in Mexico set the nation's energy industry on a new course by opening the country to private investment, thus ending the 75-year monopoly of Pemex, the state-owned oil company. With hydrocarbon production in decline and demand for energy projected to rise, Mexico acted out of necessity to legalize outside participation in the oil and gas industry and to boost investment and growth in the energy industry as a whole. Today, private companies recognize the opportunity for investment in Mexico, particularly in the petroleum sector where years of under investment upstream to downstream have left the nation in a precarious situation to meet growing petroleum demand.

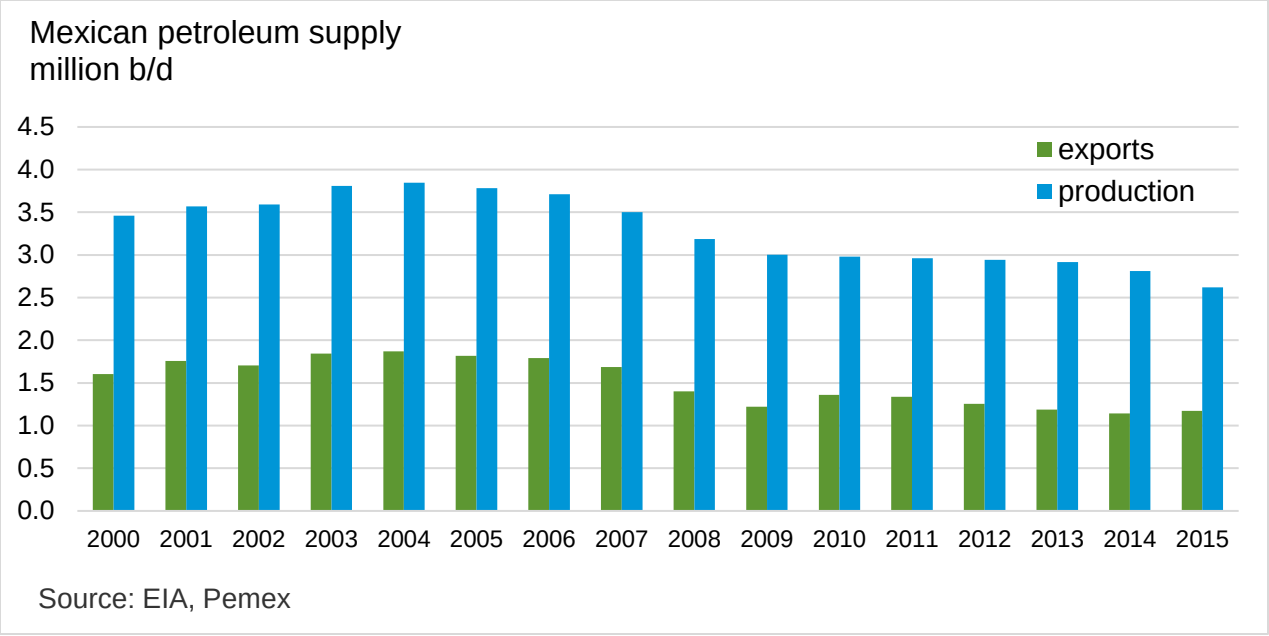
Once one of the top oil producers in the world, Mexican oil output has been falling for more than a decade and is now at the lowest point since 1981. Since peaking in 2004, production of crude oil in the Cantarell oil field and other producing regions has experienced falling output due to natural decline and lack of investment in new exploration and production. Today, Pemex faces massive budgetary shortfalls, debt and has not implemented the amount of investment needed to maintain oil production, produce refined products and transport them to the national market. As recently as 2008, the oil sector generated about 37% of Mexico's government revenue. That share dropped to 20% in 2015 as a result of falling production and lower oil prices, but it can also be attributed to Mexico's efforts to diversify its economy and tax reform.[1] Even still, the Mexican government has been forced to extend budget cuts for 2017 to almost $13 billion, most of which is attributed the Pemex budget.[2]

Petroleum consumption in Mexico is predicted to increase by 40% from 2015 to 2029, led by 57% demand growth in the transportation sector. Mexican refineries require overdue maintenance and costly upgrades in order to meet the growing demand for refined products. As a result, most of this demand will likely be met with imports supplied from U.S. Gulf Coast refineries. The majority of imports today arrive by sea; however, foreign companies are considering investment in pipelines and rail options to transport petroleum products from the U.S. to Mexico.

The situation may have seemed dire, but with recent energy reforms investment is beginning to flow into the country and there is hope for a renewal in petroleum production to meet the growing consumption in the expanding Mexican economy.

Crude Oil Production

Mexican oil production (including condensate) averaged 2.5 million barrels per day (b/d) through the first half of 2016, a significant decline from peak output of 3.8 million b/d in 2004, driven by lack of investment in exploration and production and new technology to support existing fields. Mexican exports of crude oil have declined 30% since 2004 to less than 1.2 million b/d.



Most of Mexico's oil production is of heavy crudes, which are too difficult for the Mexican refineries to process. The heavy crude oil is exported to the U.S. Gulf Coast instead where the more complex refineries process it into refined products such as gasoline, diesel and jet fuel which are in turn shipped back to Mexico and to other countries.

Pemex has been forced by low production and export revenue to take drastic measures to stabilize its financial future. In 2015, Pemex lost $30 billion while company debt totaled US$80 billion.[3] On top of operating losses, company pipelines were a constant target of sabotage and illegal tapping, costing hundreds of millions of dollars in loss. A new CEO was installed in February 2016 with the mission of turning the company around. Given budget autonomy by the energy reform, Pemex slashed its 2015 budget by $4.1 billion and 2016 budget by US $5.5 billion with a greater cut expected for the 2017 budget. Operating costs have been slashed by reducing the company workforce by 10%, convincing the federal government to cover some of the company's pension obligations and negotiating to decrease the company's burdensome tax obligation by a third.[4] Plans to upgrade the country's ailing refineries were postponed in early 2015, but some projects were re-announced later in the year.

Once a state-owned monopoly, Pemex must now learn how to adapt to the new marketplace as competition is introduced. Partnering with private companies in exploration and production, one of the main goals of the reforms, must happen in order to stabilize national production and to compete with private companies. In June, Pemex announced it was seeking a partnership with private companies to jointly develop the Trion deepwater oil and gas block, a first for the Mexican industry.[5] Pemex lacks experience in deepwater so partnering with more experienced companies allows for development of resources in technically difficult areas. Pemex will likely participate in

many more production sharing agreements in deepwater along with other types of technical plays such as shale gas in the Burgos basin.

Auction Rounds

A primary goal of the energy reform was to establish a transparent bidding process for private companies to participate in exploration and production of Mexico's hydrocarbons. After a difficult start with phase one of the auction, adjustments were made to the contracts to incentivize more participation and the following rounds awarded many more blocks to bidding companies. Thus far, three phases of Round One of the bidding process for tenders on oil blocks has awarded 24 contracts to develop resources both onshore and offshore and will bring in an estimated $7 billion in investment.[6] The fourth phase of Round One, to be held on December 5th 2016, is for participation in deepwater fields or "the jewel in the crown" according to the Mexican energy ministry, Sener. Round Two of the auctions commenced in July 2016 and will offer up 15 shallow water blocks.

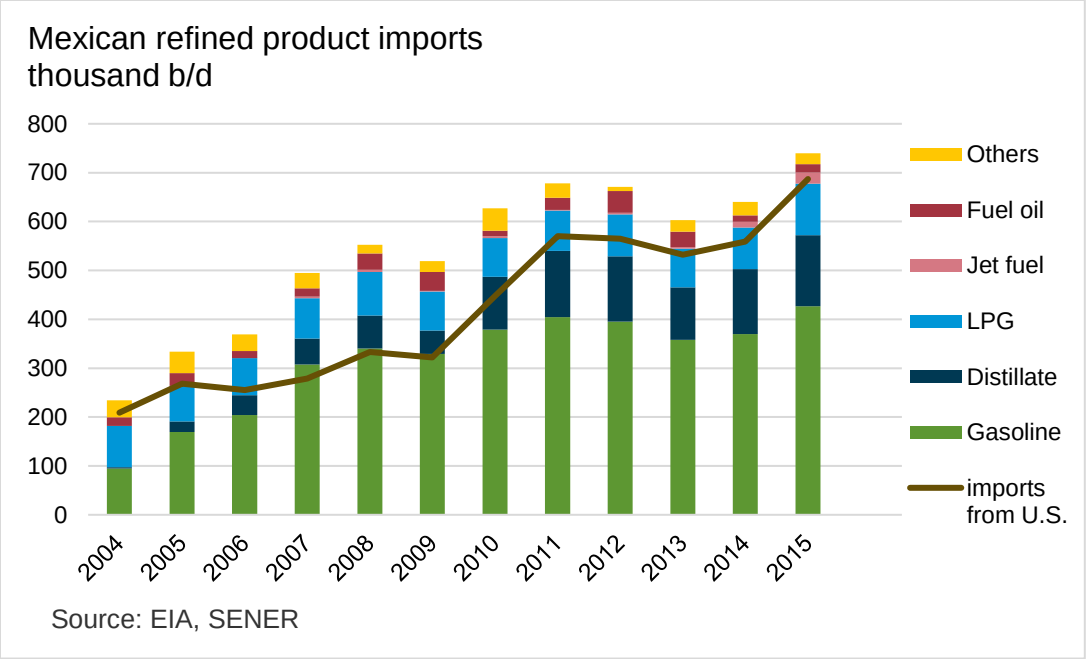
Refining

With the opening of domestic markets to outsiders, Mexican midstream and downstream assets now face competition from foreign competitors for the first time. Refineries have struggled to keep output in line with growing demand for petroleum products while adhering to new fuel efficiency and air quality standards. Additionally, increasing demand has placed more pressure on the existing downstream infrastructure.

Mexico is home to six refineries – all owned by Pemex - with a combined distillation capacity of 1.6 million b/d.[7] Refinery utilization has waned in recent years as maintenance and upgrades at the facilities have forced temporary shutdowns and low operating rates. According to Sener, in 2015 Mexican refineries operated at only 66% of capacity and produced about 1.06 million b/d of domestic demand, down 8% from 2014.[8] As a result, Mexico imported a record 742,000 b/d of refined product in 2015 and in July 2016 surpassed that figure with 867,000 b/d of product, a majority of which was gasoline.[9]

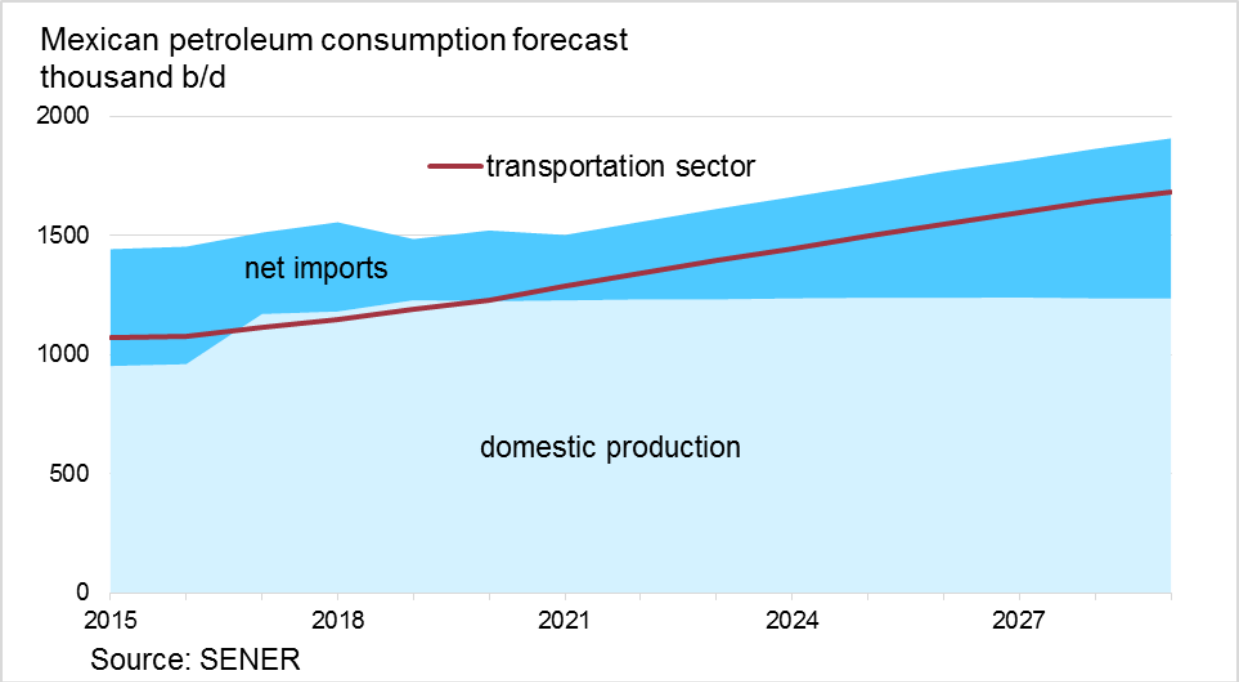
Mexican refining

Refinery	Total Capacity (mb/d)	Utilization Rate (2015)
Cadereyta	275	57%
Madero	190	59%
Minatitlan	285	53%
Salamanca	220	67%
Salina Cruz	330	72%
Tula	315	75%
Total	**1,615**	**66%**



Pemex has committed to investing billions of dollars to upgrade its refineries to process more Mexican crude oil and produce cleaner burning fuels.[10] Mexican refineries are not sophisticated enough to refine some heavy crude oil produced in Mexico; instead the oil is exported and refined products must be imported. Upgrade projects that are needed to improve distillation capabilities cost billions of dollars and will not replace the need to import refined products. In August 2015, before the U.S. ban on crude oil exports was lifted, the U.S. Department of Commerce approved exchanges of U.S. light sweet crude oil for Mexican heavy sour crude oil. The swaps would provide a lighter feedstock for Mexican refineries to increase the supply of low sulfur gasoline. In return, Gulf Coast refineries would receive heavy crude oil from Mexico, which these refineries were better suited to process.[11]

In addition to crude oil processing, desulfurization capability is required to produce cleaner burning fuels like ultra-low sulfur diesel and gasoline to meet new fuel standards set by Mexico's Energy Regulatory Commission (CRE).[12] In January 2016, Pemex awarded a $1 billion contract for the Madero Clean Diesel Project to add 25,000 b/d of clean diesel production at the Madero refinery.[13] Expanding domestic production of these fuels would offset some foreign imports, but with demand expected to grow in the transportation sector by 57% from 2015 to 2029, foreign imports will still continue to rise.[14]

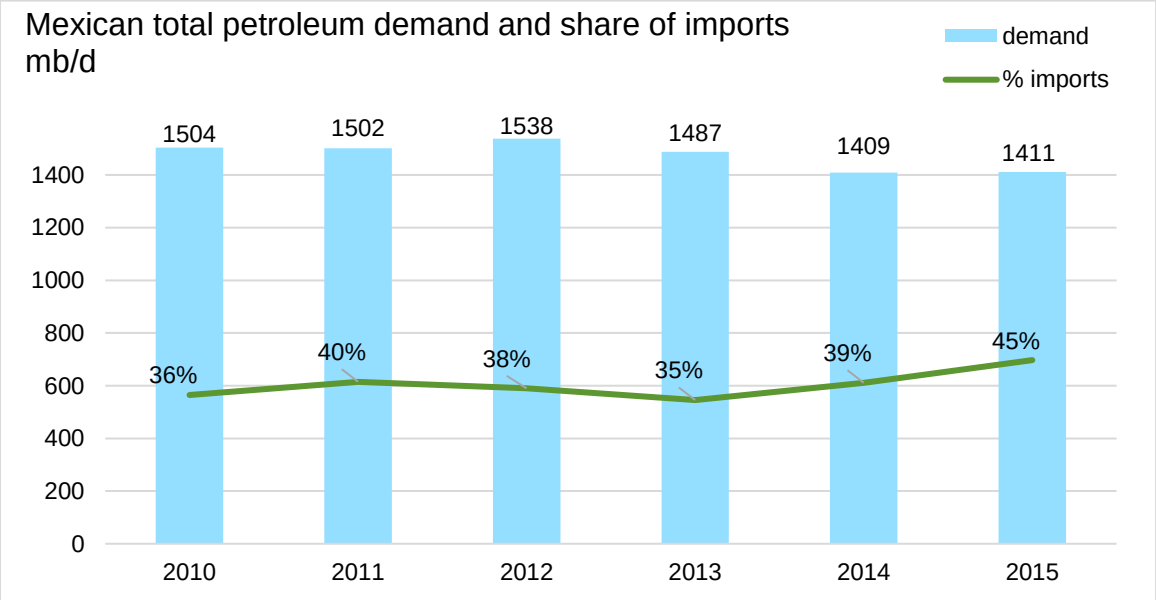


Mexican refineries lack the capacity and complexity to compete with the existing U.S. Gulf Coast refining complex so near to the Mexican market and necessary upgrades require immense amounts of capital investment. A more prudent use of Pemex funds could be to invest in upstream exploration and production instead and partner with private investors in the refining sector to finance upgrades and operating costs or sell off refining assets altogether.

Source: U.S. Energy Information Administration.

Downstream Infrastructure

Petroleum consumption in Mexico is projected to rise 40% from 2015 to 2029, led by demand growth in the transportation sector, which will grow by 57% as the economy expands and more cars and trucks are put on the road. As demand has increased over the past decade and refinery utilization waned, the share of imports of total demand has risen. In 2015, imports accounted for 45% of total supply of refined products to the Mexican market. This figure has risen by 9% since 2010, even as demand has contracted temporarily due to the implementation of energy efficiency programs and the lifting of fuel subsidies in 2014.[15]



To meet current demand for refined products, Mexico imports a large portion from other countries. A majority of refined product imports come from refineries on the U.S. Gulf Coast and arrive by ship, making their way across the Mexican market via Pemex's 5,600 miles of refined product pipelines.[16] However, demand for gasoline is expected to increase 3% per year until 2029 and existing port infrastructure and pipeline networks are already saturated and inadequate to meet projected demand for refined products, necessitating expanded port capacity and new product pipelines to handle the expanding refined product market.

Now able to operate in the Mexican market, some foreign companies have already seized the opportunity for investment in Mexico's downstream sector, announcing deals to construct new infrastructure to supply the Mexican market. Howard Energy Partners is planning to connect four U.S. refineries in Corpus Christi, Texas to Monterrey via a 287 mile pipeline by 2018.[17] NuStar Energy has announced a partnership with Pemex to

interconnect existing Mexican pipeline and terminal infrastructure with NuStar pipelines in Texas.[18] In August 2016, TransCanada announced an $800 million partnership with Sierra Oil & Gas to build a pipeline and marine terminal to transport gasoline, diesel and jet fuel from Tuxpan on the East coast across to central Mexico.[19] Finally, Transmontaigne currently operates the U.S. section of a Pemex owned pipeline in an agreement which connects a Pemex terminal in Brownsville, Texas with the Pemex refinery in Cadereyta.

An alternative to ship or pipeline transport is rail. Rangeland Energy has proposed a terminal network connected by rail that would provide refined products from the Corpus Christi area into Central and Eastern Mexico by 2017.[20] The network could eventually be expanded to connect with import terminals on the Mexican Gulf Coast.

Recognizing the reality of competition in the logistics business, Pemex has signaled its intent to relinquish some control of the market to competition and focus investment elsewhere.[21] Foreign companies are eager to invest in Mexico and have the capital to do so, while Pemex is struggling with debt and operating under sequential budget cuts. Pemex cannot afford to construct the logistical infrastructure needed to supply the country and would rather use its new liberty to allow others to invest downstream while it focuses investment in upstream exploration and production.

There is ample opportunity to connect refined product supplied by Gulf Coast refineries with growing Mexican demand by ship, pipeline and rail. Many more downstream projects will likely be announced in the months to come as demand increases, the markets open to foreign competition and Pemex relinquishes some of its downstream command to focus more investment upstream.

Retail

The retail sector of the market will soon experience the effects of the energy reform as the Pemex monopoly on gasoline and diesel sales ends and the market is opened to outside competitors. In April 2016, nine months ahead of schedule, Sener published regulatory rules and began issuing permits allowing foreign companies to compete with Pemex by importing and selling gasoline and diesel from independent service stations.[22] The decision to open the markets ahead of schedule was seen by many as a political move by the Mexican President Peña Nieto to show that the energy reforms were advancing. It was also a way to pressure investors to hasten their investments in the sector. The opening of the retail market to competition represents a significant opportunity for investors and for the consumer. The ability to import freely means that reliance on the Mexican government and Pemex is no longer necessary and a free market will now supply gasoline and diesel to the consumer.

The liquefied petroleum gas (LPG) market has already been liberalized and the effects are being seen. LPG imports in Mexico have surged, while Pemex LPG imports dropped 28% in the first half of 2016.[23] Pemex lacks the financial strength to hold off competitors

and is likely to lose more market share to foreign competitors. The gasoline and diesel markets are expected to have the same effect on the market and significantly impact prices.

Looking Forward

The Mexican Energy Reform is a great undertaking and is occurring rapidly across all sectors of the energy industry. While some changes have been readily welcomed and incorporated, some situations may grow worse before they get better. Pemex is just at the beginning of a painful reformation. The company's budget must be overhauled along with its relationship to the Mexican government; reforming tax rates and easing the dependence of the national budget on Pemex revenue. More layoffs may occur and spending cuts are certain for the next few years. The ability of the company to succeed after the energy reforms depends on its willingness to focus on its strengths and address weaknesses. Pemex is likely to turn its future focus to the upstream business and invest mostly in exploration and production; partnering with private companies to maximize the effectiveness of investments to increase Mexican production. Refineries are in great need of investment; possibly out of the reach of Pemex. Partnerships and divestitures across the downstream sector are vital to increase the capacity to refine quality product and deliver across the expanding economy efficiently.

The reforms are already successful and many necessary changes are occurring soon. The success of the deepwater auction will serve as a signal of investor willingness to make significant long-term investments towards increasing Mexican oil production. The downstream sector has emerged as an enticing investment opportunity with many foreign companies already announcing projects to increase import capabilities through pipelines and import terminals. The investment momentum must carry into the refineries if they are to remain competitive in an open market for refined products. Once fully implemented, an open market for refined products will supply the country with quality fuels at fair prices through competition.

All of these changes being brought about by the reforms are crucial to the future growth and success of the Mexican petroleum industry. Pain will be felt from changes and economic growth by the government, companies and the Mexican people, but through devoted investment and judicious changes, the future looks bright for Mexico and its energy sector.

About the Author

Alex Wood is a Policy Analyst with the Office of Energy Policy and Systems Analysis within the U.S. Department of Energy where he advises DOE positions to advance and promote energy policy and economic interests related to the petroleum sector. Prior to this, he was an analyst on the International Energy Analysis team at the U.S. Energy Information Administration. His analysis covers global oil markets with a focus on North America and the increased integration between Canada, U.S. and Mexico. He holds a B.A. in International Studies from Texas A&M University.

Endnotes

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