'Reforma Energética': Mexico Takes First Steps to Overhaul Oil Industry

By Michael D. Plante and Jesus Cañas

The fiscal health of the Mexican government and the living standards of Mexico's citizens are inextricably tied to that of Pemex, making declining crude oil production over the past decade a particularly troubling sign for many in Mexico.

The Mexican oil sector is at a critical juncture. Output from state-run Petróleos Mexicanos (Pemex) has declined more than 25 percent since peaking in 2004, despite increased investment in production and exploration for new oil (*Chart 1*). Mexico now produces less oil than Texas, and forecasts in recent years point to further declines.

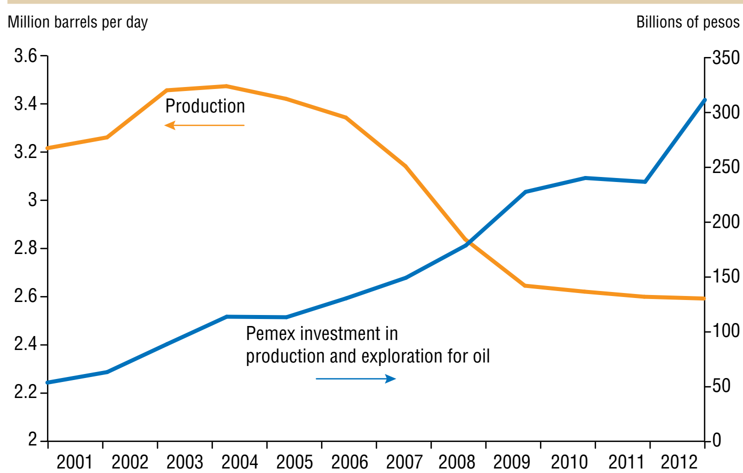
The ramifications of falling production extend well beyond Pemex. The oil and gas sector alone accounts for about 5 percent of Mexican gross domestic product (GDP). Pemex also provides 25 to 30 percent of government revenue; the company's tax payments have been so substantial that they have exceeded operating income in recent years, causing Pemex to incur losses (*Chart 2*).

Put in perspective, the size of Pemex's remittance exceeds total government spending on social programs, education, and public health and safety. As a result, the fiscal health of the Mexican government and the living standards of Mexico's citizens are inextricably tied to that of Pemex (*see box, page 19*), making declining crude oil production over the past decade a particularly troubling sign for many in Mexico.

Politicians in Mexico have been aware of these problems for some time. In 2008, the administration of then-President Felipe Calderón announced plans to resuscitate Pemex, offering reforms that would give the company greater budgetary autonomy and operational flexibility. But political opposition diminished most of the proposed changes, and the measures that passed failed to stem production declines.

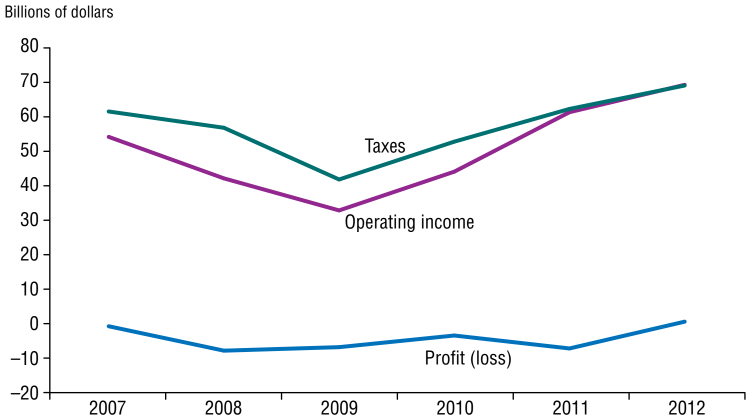
Against this background, Mexican President Enrique Peña Nieto sought to turn the tide of falling production, recently pushing through a comprehensive reform of the oil and gas industry, or *reforma energética*. It will affect every aspect of the sector, from Pemex's role to new opportunities for foreign investment. Although lawmakers haven't yet

Chart 1 Pemex Investment Hasn't Reversed Mexican Crude Oil Production Decline



SOURCES: U.S. Department of Energy; Bloomberg.

Chart 2 Pemex Tax Payment Exceeds Operating Income



SOURCES: Bloomberg; International Monetary Fund.

set the details, a framework has been put in place, leading to newfound optimism about the nation's energy future.

Mandated Involvement

The government is engaged in all aspects of Mexico's oil and gas sector. This involvement is mandated in the national constitution and in supporting laws, which together spell out rights regarding ownership of crude oil and its production.

Article 27 of the constitution stipulates that the state is the sole owner of all oil and other minerals found under the ground. Thus, the Mexican government determines where and when oil is produced and by whom. By comparison, in the U.S., private citizens may own oil and minerals found beneath their property.

Although Articles 25 and 28 grant the Mexican government direct control over the production of any oil it owns, foreign oil companies played a prominent role in extraction during the early 1900s. The impact of the constitutional articles was not significantly felt until 1938, when President Lázaro Cárdenas partially nationalized the industry and created Pemex.

Even after the nationalization, Mexico continued to rely on private contractors until the Petroleum Law of 1958 prohibited their participation. The law installed Pemex as the monopoly producer of oil, natural gas and refined petroleum products such as gasoline and diesel and as operator of related sectors such as petrochemicals.[1]

Geology's Blessings (and Curses)

Pemex was initially blessed by favorable geology and could produce abundant oil at minimal cost and effort. In the 1970s, a supergiant oil field, Cantarell, was discovered in the shallow waters of the Bay of Campeche west of the Yucatan Peninsula (*see map, page 18*). The discovery dramatically increased Mexican oil production, yielding enormous amounts of low-cost crude for decades.

As oil fields get older, their production declines. For Cantarell, the peak occurred in 2004 when production averaged 2.1 million barrels of oil per day (mb/d), accounting for 63 percent of Mexican oil output that year. Cantarell's output has slipped precipitously since then, falling in 2011 to 0.5 mb/d, or just 20 percent of Mexican production.

Pemex attempted to offset Cantarell's decline by trying to increase production at several other fields, some more successfully than others. The most notable triumph came from fields known collectively as Ku-Maloob-Zaap (KMZ), located in the same general area as Cantarell. KMZ's 2011 production was more than 0.8 mb/d, a 177 percent gain from 2004. Despite this increase, Mexico's overall production has fallen in the past decade.

Technology, Investment Required

Mexico still has oil underground and likely has other yet-to-be-discovered sources of both oil and gas. The Chicontepec field, north and northeast of Mexico City, contains large reserves, though recovery is complicated by difficult geology. After billions of dollars of development, the field produces a relatively small amount of oil, roughly equal to 2 percent of total Mexican output.

There is consensus among geologists that Mexico probably has a significant amount of oil in deepwater areas of the Gulf of Mexico, though there has been little exploration to date. This contrasts with the U.S. side of the Gulf, which has routinely produced more than 1 mb/d of crude oil for many years.

Moreover, there are locations containing varying amounts of shale oil, shale gas or both. These include the Burgos, Sabinas and Veracruz basins, as seen in the map. The prospects for shale are much more speculative than those for the Gulf of Mexico because shale development is expected to be relatively expensive and risky. Nevertheless, it is possible that at least some of these resources could be harnessed to boost production.

Successful development of these areas will require technology that Pemex does not possess. The company's payments to the Mexican treasury have left it short of cash for developing technologies. The state-owned firm could seek joint ventures with foreign oil companies. However, before the recent reform, outside concerns were permitted to collaborate with Pemex only through contracts in which they provided specific services to Pemex. These agreements have not been conducive to technology transfer.

Constitutional Reforms

President Peña Nieto signed into law last December changes to the Mexican Constitution that set the stage for a dramatic alteration of the oil and gas sector. While questions remain about the details—most requiring additional legislation—the law spells out key points of the plan.

Major Mexico Oil and Gas Fields Where Production Occurs, Development Likely

Courtesy of *Oil and Gas Journal*, PennWell Corp.

Under the new system, the state will retain ownership of any hydrocarbons found underground, allowing the government to remain in control of which resources will be pursued and when and to decide who produces the oil.

In a major break from the past, the government will allow both Pemex and private firms to produce oil and gas in the country. The companies, both foreign and domestic, can work independently or jointly with Pemex.

How private participation will work in practice will depend greatly upon the nature of the contracts Mexico's government offers. The reform is carried out through at least four types of arrangements—profit sharing, production sharing, licensing and service contracts—each with its own risk/reward trade-off:

- Profit-sharing envisions government payment to oil companies based on a percentage of the revenue generated after exploration and production costs are recovered. The outside firms would not own any of the oil produced.
- Production sharing will provide for participating companies to be compensated based on a percentage of production, after cost recovery.
- Licensing will allow companies to acquire possession of hydrocarbons at the wellhead, upon the payment of taxes, if commercial production occurs.
- Service contracts will remain part of the Mexican system. Companies receive cash payment for performing specific activities for Pemex and are paid even if production never occurs.

At least some of the contracts will allow foreign companies to book reserves for U.S. Securities and Exchange Commission accounting purposes—a necessary provision if Mexico wants to attract private investment.

Round Zero Begins

While Pemex will lose its monopoly on producing oil, the company will choose geographic areas in which it wants to operate—subject to government approval—before outside companies can enter the country. This selection process, known as Round Zero, began in late March when Pemex submitted its official list of areas to the secretary of energy.

Pemex seeks to retain all of the areas where it already produces, including low-cost fields such as the KMZ and more complicated areas in the Chicontepec. Pemex has also sought to retain access to areas where it has no production in the Gulf of Mexico, including some deepwater tracts. However, the company has not sought to become heavily involved in areas with shale oil or gas, most likely because of cost and risk.

Regulators must decide by Sept. 17 the areas over which Pemex will retain full control, those Pemex will jointly develop with private companies and the ones where private companies will operate independently of Pemex. Sometime in 2015, regulators will allow bidding by domestic and international oil companies.

Optimism for the Future

While the exact outcome of the reforms and their impact on economic activity in Mexico aren't clear, the outlook is upbeat.

The government forecasts that oil production could increase to more than 3 mb/d by 2018, a 25 percent jump from 2013, significantly reversing the recent 10-year decline. Independent research analysts estimate the reform could add 1 to 1.5 percentage points to Mexico's long-term GDP growth.

The change should also strongly benefit the economy of Texas, home to many companies likely to participate in the oil and gas sector's opening.

The outcome will, of course, depend crucially upon the still-to-be-resolved reform details. The overhaul, if effective, should entice private companies to invest in the oil sector and allow Pemex to become a more efficient and effective company. The benefits of this would include greater oil production and positive spillovers into other parts of the economy. All are benefits that states such as Texas and North Dakota are experiencing as a result of their ongoing energy booms.

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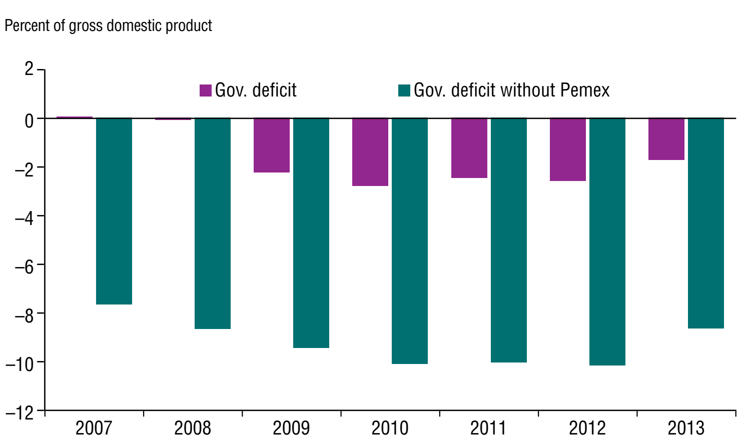
Government Payments Hobble Pemex

On the face of it, Pemex appears to be an extremely successful company. Based on annual revenue of $125.2 billion in 2013, it is one of the largest firms in Mexico, and it ranked 36th in the Fortune Global 500 that year. But size masks performance; the company has routinely lost money in recent years.

The shortfall reflects Pemex's large payments to the government, which in 2012 totaled almost $70 billion (roughly 25 percent of government revenue). With no Pemex revenues and no change in expenditures, the government deficit as percent of GDP would have been much larger (*see chart*). For example, in 2013, the deficit would have been almost 9 percent of GDP instead of 1.7 percent.

Mexico has recently enacted fiscal reform, changing the taxation of corporations and individuals. Specifics of how the new law will affect Pemex and other oil companies haven't been released. While the government needs the revenue, it is also aware that the energy tax regime has to be attractive to private investors and less punitive to Pemex for the sector to flourish.

Mexico's Relative Deficit Would More than Triple Without Pemex



SOURCES: Secretary of Housing and Public Credit; authors' calculations.

Note

[1] For further details on the Petroleum Law of 1958, see "The Prospect for Further Energy Privatization in Mexico," Ewell E. Murphy Jr., *The Texas International Law Journal*, vol. 36, no. 1, 2001, and "Energy Reform and the Future of Mexico's Oil Industry: The Pemex Bidding Rounds and Integrated Service Contracts," by Tim R. Samples and José Luis Vittor, *Texas Journal of Oil, Gas and Energy Law*, vol. 7, no. 2, 2012.