

The background of the entire page is a close-up, high-angle photograph of numerous large-diameter metal pipes stacked in a dense, overlapping pattern. The pipes are dark, possibly black or dark grey, with a metallic sheen. The circular openings of the pipes create a series of concentric circles and tunnels, leading the eye into the depth of the stack. The lighting is dramatic, with bright highlights on the inner rims of the pipes and deep shadows in the recesses, creating a strong sense of three-dimensionality and texture.

## The Geopolitics of Natural Gas

The Twilight of Mexico's State Oil Monopolism: Policy,  
Economic and Political Trends in Mexico's Natural Gas Industry

Harvard University's Belfer Center and  
Rice University's Baker Institute Center for Energy Studies

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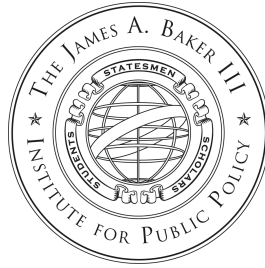
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THE TWILIGHT OF MEXICO'S STATE OIL MONOPOLISM:  
POLICY, ECONOMIC, AND POLITICAL TRENDS  
IN MEXICO'S NATURAL GAS INDUSTRY

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## **Policy, Economic, and Political Trends in Mexico's Natural Gas Industry**

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## ABOUT THE STUDY

Some of the most dramatic energy developments of recent years have been in the realm of natural gas. Huge quantities of unconventional U.S. shale gas are now commercially viable, changing the strategic picture for the United States by making it self-sufficient in natural gas for the foreseeable future. This development alone has reverberated throughout the globe, causing shifts in patterns of trade and leading other countries in Europe and Asia to explore their own shale gas potential. Such developments are putting pressure on longstanding arrangements, such as oil-linked gas contracts and the separate nature of North American, European, and Asian gas markets, and may lead to strategic shifts, such as the weakening of Russia's dominance in the European gas market.

Against this backdrop, the Center for Energy Studies of Rice University's Baker Institute and the Belfer Center for Science and International Affairs of Harvard University's Kennedy School launched a two-year study on the geopolitical implications of natural gas. The project brought together experts from academia and industry to explore the potential for new quantities of conventional and unconventional natural gas reaching global markets in the years ahead. The effort drew on more than 15 country experts of producer and consumer countries who assessed the prospects for gas consumption and production in the country in question, based on anticipated political, economic, and policy trends. Building on these case studies, the project formulated different scenarios and used the Rice World Gas Trade Model to assess the cumulative impact of country-specific changes on the global gas market and geopolitics more broadly.

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## Introduction

While Mexico possesses only 0.03 percent of the world's proved reserves of conventional natural gas, it has been ranked fifth place taking into account its prospective technically recoverable shale gas resources—545 trillion cubic feet (TCF) according to a survey by the US Department of Energy (EIA 2011a), published in 2011 and revised in 2013. In the revised survey, Mexico ranks after China (1,115 TCF), Argentina (802 TCF), the United States (665 TCF), Algeria (707 TCF), and Canada (573 TCF) (EIA 2013, 10), out of a total of 41 countries whose resources were assessed. If the figures are confirmed to be accurate, North America is bound to become a major non-conventional gas powerhouse in the years to come.

In November 2011, former President Felipe Calderón (2006-2012) publicly recognized the huge potential of Mexican gas reserves and called for a revisitation of national energy strategy, which until then was solely based on the development of crude oil and associated gas in shallow and deep waters in the Gulf of Mexico. Calderón's revised strategy, released at the turn of the last year of his administration, aims at developing current untapped non-conventional gas resources by attracting more investment in pipeline expansion and upstream activities, in order to produce gas from shale plays by the year 2016. However, financial, technological, and operational constraints in Mexico's energy sector had to be overcome first in order to make that goal credible.

President Enrique Peña (2012-2018) began his administration by showing his ability to create a political coalition in order to frame the discussion, debate, and political feasibility of Mexico's much-needed future reforms. By forging this political entente, Peña attempted to avoid the gridlock of past reforms whose institutional outcome was rather poor, such as the last energy bill that was discussed and passed in 2008. In the summer of 2013, President Peña submitted to the Mexican congress a bill calling for a constitutional amendment openly challenging the current monopoly regime within Mexico's energy industry. Probably this bill will be passed at the end of 2013 or during the first semester of 2014, completely transforming the energy scenario under which the Mexican energy industry has operated since 1960, when the state oil monopoly regime was fully consolidated.

This study reviews the current potential of Mexico's gas resources, both conventional and non-conventional, and how this could impact the country's energy supply in the future. It also explores the policy, infrastructure, political, and economic constraints that will shape Mexico's gas policies in the years to come. The study finds that Mexico's gas potential is highly promising, in terms of both conventional gas and shale gas resources. It summarizes what is at stake in President Peña's energy proposal and how the other main political parties have reacted. The major goal of President Peña seems to be not the rapid development of shale resources, but rather the radical transformation of the country's energy environment—in which non-conventional gas resources could eventually play, in the long run, a major role. The final part of this essay explores the policy agenda for the coming years under a scenario where state monopolism in energy is over and private participation is permitted across the value chain in the oil, gas, and power industries.

## **The Driving Factors of Growing Gas Demand**

### *Explaining the Rapid Growth in Consumption*

Once the North American Free Trade Agreement (NAFTA) came into force in 1994, which made possible a partial liberalization of the Mexican gas industry (foreign trade, distribution, final sales, and storage), Mexico's natural gas consumption grew at an annual average rate of growth (AARG) of 3.5 percent, above overall primary energy consumption's AARG of 2.7 percent, as shown in Figure 1. Natural gas consumption has definitely been the driving factor explaining growth in energy demand in Mexico during the past 19 years, taking a share of 38 percent in the country's primary energy mix.<sup>1</sup> The reason for this rapid growth is the decision taken by Mexico's electricity monopoly, Comisión Federal de Electricidad (CFE), to switch from burning fuel oil to natural gas in power generation from the 1990s to the present. So far, natural gas accounts for 58 percent of electricity produced by public utilities and 73.9 percent produced

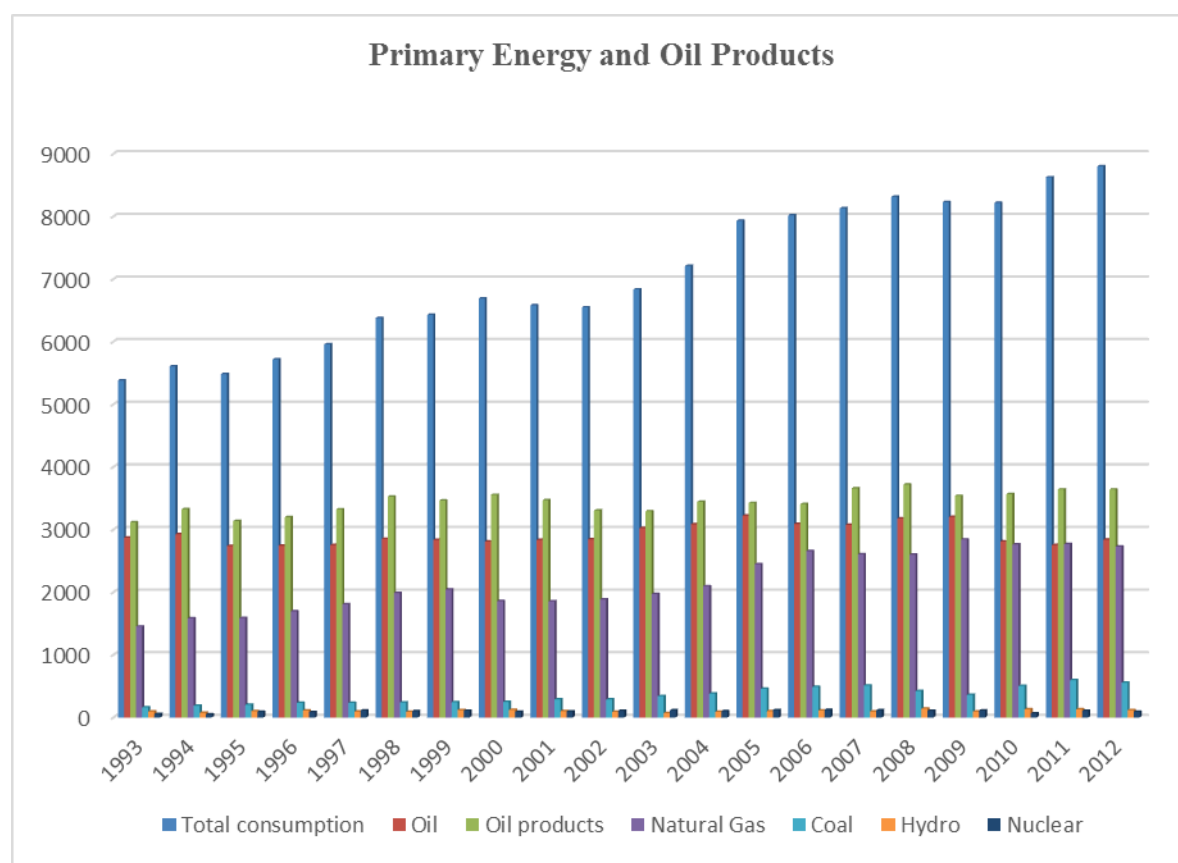
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<sup>1</sup> Crude oil (including condensates) accounts for 43 percent, coal 8 percent, nuclear 1.3 percent, and hydro 1.6 percent. Biomass, mainly wood and sugar cane disposal, still accounts for almost 5 percent of the overall primary energy mix.



by private firms. The phase-out of fuel oil in power generation explains why overall oil product consumption increased during this period at an AARG of just 0.09 percent.<sup>2</sup>

**Figure 1. Annual Energy Consumption Growth in Mexico, 1993-2012**



Source: SENER-SIE

Gas consumption is in fact driven by Mexico's own energy sector, which is basically run by two state monopolies: Petróleos Mexicanos (Pemex) and CFE. Pemex on its own—either as a company transforming oil and gas, or as a firm using natural gas for reinjection or for other processes—represents 47 percent of overall gas demand in the country. Including CFE's gas consumption, which is mostly an input for producing power, 85 percent of primary gas demand is in the hands of Mexico's two energy monopolies. A private market for energy is yet to be

<sup>2</sup> Figure 1 presents figures for consumption of crude oil, whose AARG was 0.03 percent for the period, and oil products, whose AARG was slightly higher: 0.9 percent. The first estimation does not include imports of oil products (Mexico does not import crude oil), while they are incorporated in the latter estimation. Nonetheless, taking into account the two estimations, the AARG of natural gas is much higher than petroleum's.

created, mainly for customers of the residential, services, and transport sectors, which currently represent 1.46 percent of the overall market.<sup>3</sup>

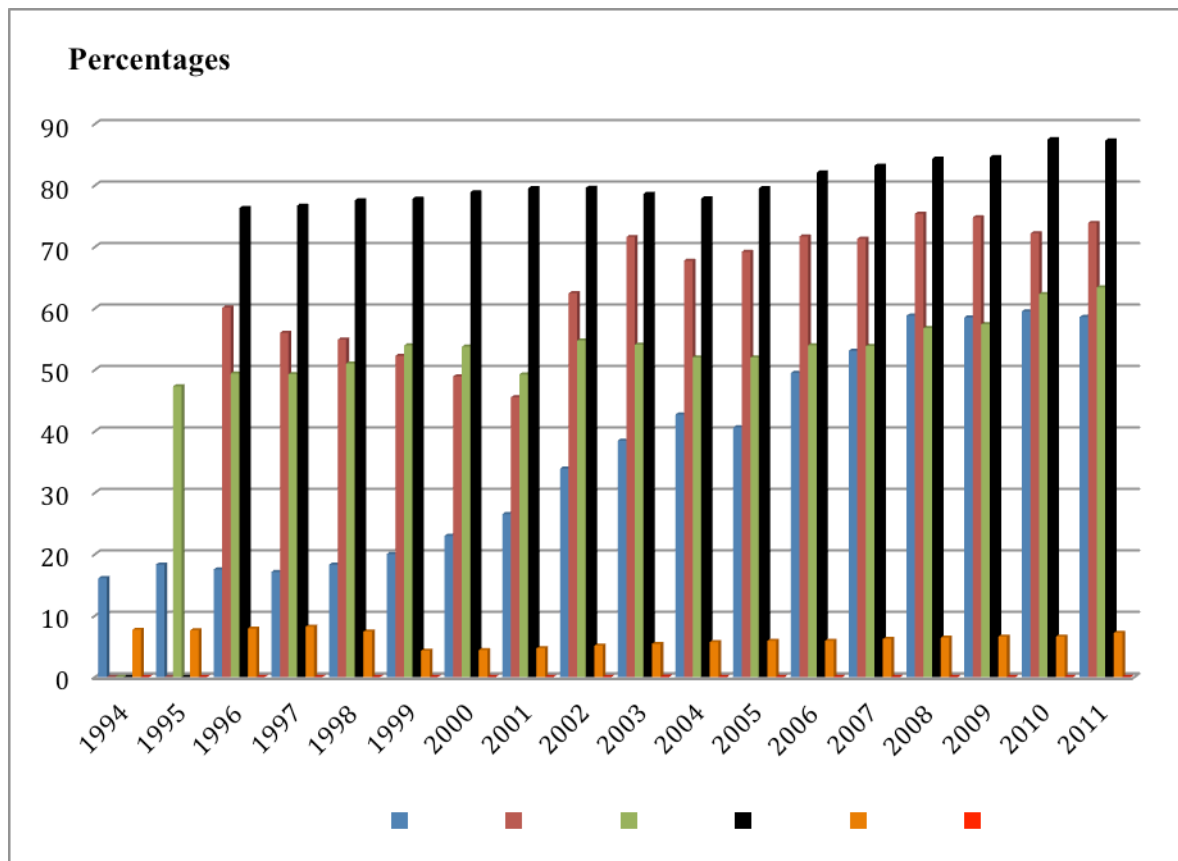
The fact that state monopolies remain the major consumers of natural gas, in spite of its partial privatization earmarked by the implementation of NAFTA, is due to the status that natural gas holds in the overall energy mix of the country. Natural gas is traditionally considered a byproduct—an associated product of the oil industry (Pemex has usually recovered natural gas in association with the exploitation of oil wells). Pemex considers natural gas a secondary fuel compared to crude oil, whose exports outlets have guaranteed the benefit of a juicy rent,<sup>4</sup> from the “oil boom years” of the early 1980s to the present. Currently, more than 35 percent of total government fiscal revenue comes from Pemex’s transfers.

During the past 15 years, the Mexican government has discovered the advantages of developing Mexico’s natural gas potential on its own. Since burning natural gas combustion releases lower greenhouse emissions (GHE) than coal or fuel oil, CFE has gradually increased the use of combined cycle natural gas plants in power generation. At the same time, the development of reserves of non-associated gas, most of them located in the Burgos and Sabinas basins (located in Mexico’s northeast region, bordering the oil and gas rich state of Texas), was initiated during the Fox administration (2000-2006).

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<sup>3</sup> Unless otherwise stated, all figures for the Mexican gas and energy industry were drawn from Mexico’s official government energy database, SENER: Sistema de Información Energética (SIE).

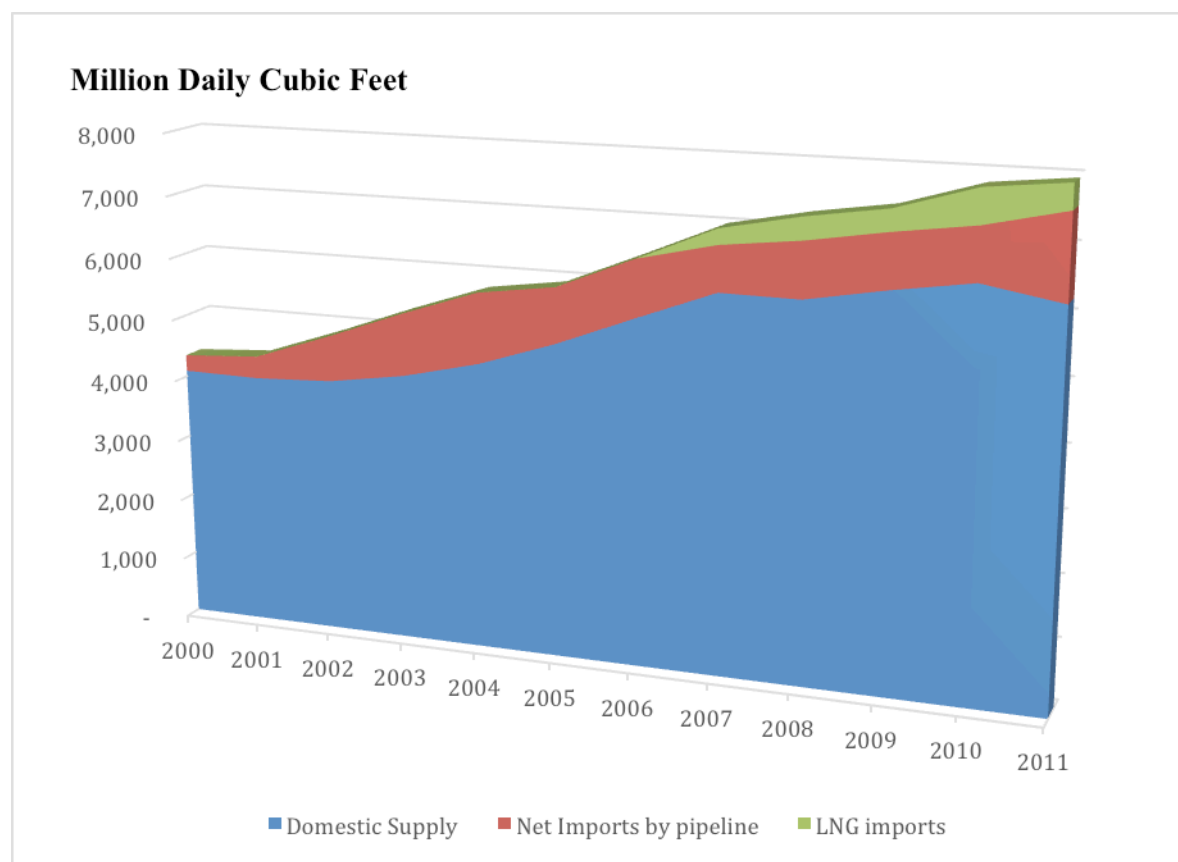
<sup>4</sup> According to Mexico’s Ministry of Energy, hereafter called SENER (Secretaría de Energía), the oil rent is the amount of income left from deducting all costs incurred in the production and marketing of products from the overall value of hydrocarbons production, priced at international prices. Consequently, all sorts of subsidies, discounts, and transfers from Pemex to unions or state agencies should also be discounted from the oil rent. See SENER 2008.

**Figure 2. Gas Consumption by Industry Sector, 1994-2011**

Legend: blue, electricity; dark orange, services; green, industry; black, petroleum; orange, residential; red, transport

Source: SENER

Figure 2 portrays this switch toward natural gas in power generation for public needs. While in 1994 this fuel contributed only 16 percent of overall inputs for public electricity generation, in year 2011 it amounted to 58.6 percent. This trend is similar, though less accentuated, for the rest of the consuming sectors, with the exception of those representing residential and transport activities, whose fuel switch—mainly from gasoline or liquefied petroleum (LP) gas to natural gas—is yet to be done. It is worth highlighting that natural gas has traditionally remained Mexico's overall petroleum industry favorite fuel, currently representing 87.5 percent of overall fuel consumption.

**Figure 3. Natural Gas Supply and Net Imports, Mexico**

Source: SENER, 2012

According to President Enrique Peña's National Energy Strategy (NES), launched in April 2013 (SENER 2013), fuel oil and diesel substitution<sup>5</sup> in the power sector in favor of natural gas and renewables will continue during his presidential term (2012-2018) and beyond, foretelling a continued growth in gas demand above overall energy consumption, as has been the case in recent years. While Mexico's domestic gas supply has increased at an AARG of 3.9 percent, from 2000 to 2011, consumption grew at an AARG of 5.7 percent. This explains the rapid hike in imports (shown in Figure 3), which currently account for 22 percent of consumption. Natural gas imports come either by pipeline from the US or by ship tanks as liquefied natural gas (LNG). So far, most imports come from the US by pipeline via several border interconnection points that flourished when NAFTA liberalized cross-border trade. Imports are mainly handled by Pemex

<sup>5</sup> At present, more than 21 percent of overall electricity production is generated by burning diesel and fuel oil. This means that the market for natural gas in this sector is still high.

and CFE, and only minor amounts are carried by private utilities. LNG imports currently pass through three regasification plants, one located in Altamira, Tamaulipas, in the Gulf of Mexico; the second located in Ensenada, Baja California; the third one located in Manzanillo, Colima, came on stream in 2012. During the past 10 years, imports grew by more than 20 percent annually on average. Imports of LNG currently amount to 27 percent of overall imports, and they are anticipated to grow in the foreseeable future as long as the development of non-conventional resources remains uncertain, due to infrastructure, economic, and policy constraints.

*The Potential of Conventional and Non-Conventional Gas Resources*

In contrast to what the Canadian and US energy industries are witnessing, the panorama of hydrocarbon fuels in Mexico is rather critical, to say the least. After a downward reclassification of proven reserves by Pemex in 2002, the three types of reserves that the company traditionally typifies (proven, probable, and possible) have persistently declined, barely stabilizing in the last years at a total of 44.530 million barrels of oil equivalent (MBOE). From this stock, proven reserves (13.868 MBOE) amount to the equivalent of 13 years of current production (including natural gas liquids). Crude oil production peaked in 2005, reaching 3.3 million barrels daily (MBD),<sup>6</sup> before progressively declining in subsequent years. In 2012, production was 2.547 MBD, a decrease of almost 24 percent compared to what was achieved in 2005. The same thing happened with exports, which peaked in 2006 at 1.79 MBD and then fell to 1.25 MBD in 2012, a 31 percent drop (Pemex 2013). At the same time, imports of petroleum products, especially gasoline, have increased, because the processing capacity of Mexican refineries is overtaken and the construction of a new one has not yet begun. The production of natural gas, after seeing significant growth over the past decade with 7.031 trillion cubic feet (TCF) of annualized production in 2009, fell to 6.385 TCF in 2012. With growth in domestic consumption exceeding the increase in production, which is driven by electricity generation, imports of natural gas have also climbed in the past few years, going from 592.5 million daily cubic feet (MDCF) in 2002 to 1,089.3 MDCF in 2012 (Pemex 2013).

The decline in reserves and in the production of both crude oil and natural gas is largely due to the exhaustion of the last supergiant well discovered during the oil boom of the late 1970s and

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<sup>6</sup> These figures do not include condensates or natural gas liquids.

early 1980s, Cantarell. This reservoir, which supplied until quite recently more than 60 percent of total crude oil production, now contributes only 17 percent.<sup>7</sup> Other wells located in the marine region, such as the complex Ku-Maloob-Zaap have increased their production in recent years, but without being able to compensate for Cantarell's steep decline. Notwithstanding, in addition to the probable and possible reserves located mainly in the region of Chicontepec, Mexico has a significant amount of prospective reserves of both conventional and non-conventional resources. In early 2013, the Secretariat of Energy (SENER) estimated the amount of prospective reserves at 54.500 MBOE, almost half of them located in Gulf of Mexico deep waters. SENER also officially recognized for the first time an estimate of prospective reserves of non-conventional hydrocarbons of 60.200 MBOE (SENER 2013, 43). In other words, apart from the three types of reserves that Pemex has assessed at a total of 44.530 MBOE, SENER additionally estimates prospective resources, both conventional and unconventional, that amount to 114 MBOE and 700 MBOE respectively.

Mexico's proved reserves of natural gas amount to 17.224 TCF, equivalent to just 7 years of production. However, if we add probable and possible reserves to the first figure, the overall figure amounts to 61.641 TCF, of which 71 percent is associated with oil (SENER 2012a). 50 percent of those resources are located onshore, mainly in the northern part of the country. Pemex also estimates the potential of prospective reserves to be around 56.175 TCF, 53 percent of which are located in deep water Gulf of Mexico and 18 percent in the Sabinas basin (SENER 2012b, 18).

As for the potential of non-conventional gas resources, the Mexican situation looks very promising. The US Energy Information Administration's well-known study assessing worldwide technical recoverable resources (TRR) of shale gas estimates Mexico's recoverable resources at 545 TCF (EIA 2013, 10). These resources are located in the northeast part of the country in the Burgos and Sabinas basins, a geological extension of the shale plays located in Texas. By

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<sup>7</sup> Cantarell peaked with 2.035 MBD production in 2005, while in 2012 it only produced 454.1 thousand barrels daily (TBD). Increasing production of other major fields has compensated for part of this abrupt decline—especially at Ku-Maloob-Zaap, located in the northeast marine region. These fields produced 288.7 TBD in 1999, while 13 years later, they were producing 842.1 TBD. Cantarell produced 1.6 billion daily cubic feet (BDCF) of natural gas in 2008 and 1.07 BDCF in 2011. The Burgos basin is the most productive at present, with 1.34 BDCF (Pemex 2013, 17, 19).



contrast, Mexico's official estimates are more conservative, around 141.5 TCF of shale gas and 31.9 billion barrels of shale oil (SENER 2013, 44).

### **The Political and Policy Climate Surrounding President Peña's Energy Bill**

State-run oil monopoly and resource nationalism have been the two major paradigms in the governance of Mexico's energy industry from the turn of the 20<sup>th</sup> century to the present. Article 27 of the Mexican constitution famously states that hydrocarbons and any other natural resource existing in the subsoil and continental shelves belong to the nation. This forms the basis of what some authors have called "resource nationalism" (Mares 2011), meaning that the country's energy resources should be exploited in such a way that all Mexican nationals can benefit. Article 27 allows for concessions to private firms in order to exploit subsoil natural resources, but it specifically bans them, as well as private contracts, in the case of hydrocarbons.<sup>8</sup>

Article 25 of the constitution also states that strategic industries in Mexico must be exclusively administered by the state, while Article 28 includes in that category, among others, the oil and hydrocarbon industries, the "basic petrochemical" sector, radioactive material, and the generation of electricity and nuclear power. Both articles differentiate, however, between "strategic" and "priority" industries—the latter are entitled to be run by private firms or in association with public enterprises, though still under the "stewardship" of the state. These two articles of the Mexican constitution, as well as a myriad of bills and regulations concerning the operation of the energy sector and of public enterprises, consider all the value chains of the hydrocarbon industry as strategic, thus confining their exploitation under state monopolies. Consequently—in parallel to the resource nationalism earmarked by the Constitution of 1917, which reached its highest momentum in 1938 with the expropriation of foreign companies in Mexico—the state oil monopoly regime was progressively reinforced in such a way that virtually all chains of the hydrocarbon, electrical, and nuclear industries (including the "basic petrochemicals") were brought under the control of two state-owned companies.

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<sup>8</sup> Contracts between state firms and private companies are nonetheless accepted and regulated under administrative bills.

State monopoly over hydrocarbon resources aimed at managing them as a strategic stock with the ultimate goal of strengthening the state's capabilities and interests, whether economic, political, ideological, or any other sort. Thus, in contrast with other countries where oil wealth also belongs to the nation (such as Canada, Brazil, or Venezuela), Articles 25 and 28 made the Mexican state and its government agencies the only entities legally entitled to exploit upstream and downstream activities. In reality, this meant that only the two monopolies, Pemex and the CFE, could exploit, produce, and distribute oil and hydrocarbon fuels as well as electricity. Thus, in the field of energy, nationalism and state monopolism are not the same. While the first refers to the nation's ownership of subsoil resources and offshore shelves, the latter refers to the strategic nature of an industry or of the value chain of a sector—which, according to article 25 of the constitution, is solely managed by the state and its enterprises.

From the expropriation of foreign oil companies in 1938 by President Lázaro Cárdenas (1934-1940) until the signature and enforcement of NAFTA in 1994, the strategic management of energy resources by government monopolies became the equivalent of a *raison d'État* through which the state ensured its own strength and political survival. From that time to the present, the rentier state strengthened itself by squeezing Pemex's income, and the appropriation and distribution of rents via taxation became a permanent political bargaining among all stakeholders involved. Though Pemex gross income has traditionally been much higher than the company's operational costs, the state oil monopoly suffers from an endemic deficit once a myriad of taxes are deducted. For instance, in 2012 overall sales income amounted to \$126.6 billion, of which almost 50 percent came from exports. Though gross income before taxes amounted to \$69.6 billion, Pemex transferred to the Mexican government \$69.4 billion of federal contributions levied on oil production, causing a general deficit of \$28.7 billion taking other deductions into consideration (Pemex 2013, 6).

When NAFTA came into force, a bundle of constitutional reforms and administrative bills were enacted in order to adapt the energy sector to the policy of openness and competition introduced by the agreement. The succeeding reforms or attempts at reform—including the latest regulatory modification made during the administration of President Calderon—aimed at opening certain value chains of the industry to market competition, such as electricity generation or the refinery

of oil products. This was always done by passing amendments to administrative bills, without challenging constitutional mandates. The results have been rather fruitless. The reform of 2008, for instance, only introduced changes to the internal organization of Pemex, by enlarging its governing board with four “professional” advisors and by creating a supervisory agency subordinate to SENER, the Comisión Nacional de Hidrocarburos (CNH), whose mission is to revise the criteria by which Pemex operates upstream activities, such as those located in Chicontepec. At any rate, the 2008 reform made no significant changes to address the more serious constraints facing the energy industry, particularly in the area of upgrading technology and know-how to ensure more efficient exploitation of resources.

### *The Rationale of President Peña's Proposal<sup>9</sup>*

The day after President Peña came to power, he signed—along with the leaders of the two major opposition parties—a tripartisan *Pacto por México* (Pact for Mexico).<sup>10</sup> The pact specified that the two major opposition parties, along with the president's party, would engage in a series of major reforms necessary for the country under the condition that the party sponsoring a bill would consult and negotiate with the other two in order to facilitate its passage in Congress. The pact covers a myriad of reforms such as public safety, judicial reform, education, poverty alleviation, science and technology, and energy. The pact calls for energy reform in order for the sector to act a catalyst for Mexico's development by attracting investments, spurring technological change, and generating value chains. However, most of the specific goals and principles merely called for a major reform in Pemex's management. According to the tripartisan deal, the state oil monopoly ought to be transformed into a public enterprise with a “productive” profile, able to compete worldwide and reach the rank of a first class national oil company (NOC).<sup>11</sup> Though the pact did not specifically mention how to reach that goal, it called for all necessary reforms at the regulatory, corporate, and fiscal levels. The document highlighted that

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<sup>9</sup> This section draws from the official stated position of each party, posted on their respective websites. PRI: <http://pri.org.mx/TransformandoMexico/>, PAN: <http://www.pan.org.mx/>, and PRD: <http://www.prd.org.mx/>.

<sup>10</sup> The full text of the document can be found at <http://www.animalpolitico.com/2012/12/los-cinco-acuerdos-del-pacto-por-mexico/>.

<sup>11</sup> According to a study by Hartley and Medlock (2011), comparing technical efficiency of oil firms around the world, either public owned, private owned, or with mixed capital, during nine years of the past decade, Pemex ranked 37th out of 62 firms. According to this ranking, Pemex is not only far below most big private firms, but also far below some major NOCs, such as Statoil/Hydro from Norway (ranked 6th), SINOPEC (ranked 10th), and Saudi Aramco (ranked 20th).

subsoil resources would remain under state control for the nation's benefit and that Pemex would remain a public firm. While the assets of the state monopoly would not be privatized, the document acknowledged the need to build a "competitive" environment in downstream operations such as refinery production, pipelines, and transportation networks, as well as in petrochemicals. No specific mention was made of shale resources, vaguely included under the general goals of "multiplying" upstream operations in exploration and production.

There is already a consensus in Mexico, both in the main political parties and in civil society, that the status quo in energy is unsustainable. A deep reform of the sector is urgent and necessary. There is no consensus, however, about the best way to implement such a reform. In August 2013, President Peña, elected from the Partido Revolucionario Institucional (PRI), submitted to congress an energy reform bill, which immediately provoked a response from the two main opposition parties, the Partido Acción Nacional (PAN) and the Partido de la Revolución Democrática (PRD). The essence of the PRI reform is to modify articles 27 and 28 of the constitution, in its sixth and fourth paragraphs respectively; this would end the state oil monopoly regime without compromising the national ownership of all hydrocarbon and subsoil resources. This is a historical departure from previous reforms, since a constitutional amendment is requested, aiming to declassify all value chains of the hydrocarbons industry (and the majority of the electricity sector, except the national and public transmission systems) from being considered as "strategic," thus suppressing the legal structure on which the state oil monopoly was built. If the congress passes such an amendment, this would allow private firms to participate as investors or contractors at all levels of the hydrocarbons industry and the power industry except the transmission grid. PRI's proposal also suggests that the participation of private firms—either national or international ones—ought to be done under contracts, explicitly banning the possibility of granting concessions in both the hydrocarbon and electricity sectors.

A reform of this kind would certainly suppress the ambiguity under which private contractors with Pemex have operated since 1960—the year the constitution was amended to prohibit contracts with the state-run company (although in reality Pemex has persistently worked with private contractors). Under PRI's proposal, however, private contractors would be allowed to participate not only with Pemex, but also directly in the operation and development of upstream

and downstream activities. Regulations regarding the participation of private contractors, under production sharing, profit sharing, or risk sharing agreements, would be defined in the regulatory and administrative bills.

The goal of strengthening Mexico's energy security is one of the driving forces behind President Peña's position. In the foreword of his proposal, he argues that the country's energy self-sufficiency has severely eroded in the recent years, and that Mexico is at risk of becoming a net importer of hydrocarbons. He mentions the rapid increase in imports of natural gas, gasoline and other refined products, and petrochemicals, as well as the infrastructure (transport and transmission pipelines) and technological constraints hampering the development of the country's huge energy potential. When the president's energy strategy was released in April 2013, one of his major policy goals was to ensure growth in the domestic supply of energy (hydrocarbons and renewables) in order to guarantee higher rates of economic growth in the years to come. Thus, energy security is understood as the need to guarantee a higher domestic supply of energy resources, in order to sustain the economic development of the country.

A reform of this sort would no doubt ease the pressure on Pemex to develop the deposits in deep waters and initiate the development of unconventional resources of gas, whose production costs in Texas are less than half of Pemex's in similar basins (*see sections below*). This reform would also boost downstream operations, not only in refining but also in transmission and distribution networks. It would give momentum to the petrochemical industry, since the proposed reform liberalizes once and for all the so-called basic petrochemicals (i.e., the supply of methane and ethane) and opens the generation of electric power to greater competition, especially from renewables.

Thus, PRI's proposal dissociates resource nationalism from the state oil monopoly regime, which have grown in parallel from the years of the expropriation to the present. The energy reform bill challenges the very basis of the latter model, but without compromising the national property rights of mineral resources, at least under the constitutional mandate. As for Pemex's corporate governance and fiscal regime, PRI's proposal recognizes the need to decrease the company's taxation burden. A new fiscal regime for Pemex is being considered as part of a wider fiscal

reform debate that was initiated in parallel to the energy bill. Various committees of the Mexican congress already discussed fiscal reform, and it will likely be enacted very soon. However, any modification to Pemex's fiscal regime was cancelled, at least until Congress acts on the new energy bill.

### *PAN's and PRD's Proposals*

Traditionally, post-NAFTA energy reforms focused the debate on the advantages and disadvantages of allowing private firms to participate in the different value chains of the industry without challenging the state oil monopoly regime. This has polarized the debate between those who call for a "privatization" of national resources and those who claim the legitimacy of state sovereignty over them. This sort of debate has been influenced more by ideological and political positions than by an attempt to differentiate the question of the ownership of the resources—which will continue to belong to the nation, according to PRI's proposal—from the managerial models of their exploitation (state monopoly, public-private partnership, contracts or concessions to private investors, etc.).

This debate was renewed once the PRI submitted its proposal to Congress and has overshadowed the discussion about the appropriation, expenditure, distribution, and conservation of the oil rent—a wealth that ultimately belongs to the nation, that is to say, to all Mexicans. Until now, due in good part to the prevalent model of monopolistic exploitation, such income has been appropriated by the Ministry of Finance and by a political class—integrated by public officials, partisan congressional blocs, and trade union leaders—whose managerial practices lack the transparency and accountability necessary to conserve part of those resources for future generations. PRI's proposal maintains a silence in this regard, while PAN's position attempts to emphasize it as the major point of the discussion.

PAN also proposes a constitutional amendment to articles 25, 27, and 28. This proposal is more comprehensive than PRI's and is grounded in security, sustainability, climate change, and productivity concerns. Similar to the PRI proposal, PAN challenges state monopolism against resource nationalism by proposing the management of the hydrocarbons and electricity industries through a general system of concessions, and not necessarily restrained to contracts as PRI is



suggesting. Concessions could be granted through international bids to public or private firms or through public/private associations owned by nationals or foreigners. However, its major difference from the PRI proposal is in the institutional architecture proposed by PAN for managing concessions and permits, the fiscal mechanism for recovering and enhancing the oil rent, and the regulatory mechanisms for regulating the activities of firms, public or private, in downstream operations and in electricity generation.

Besides introducing the idea of concessions in article 27 of the constitution, PAN also suggests that this same article should oblige the government to maximize the resources of oil rent to the benefit of the nation. To do so, the party proposes to create an independent Mexican Petroleum Fund, recognized under article 28 of the Constitution, that is entitled to collect through fiscal mechanisms the revenues derived from oil and gas exploitation, and then to decide how to distribute or preserve this rent for the benefit of present and future generations. Furthermore, in contrast to PRI's proposal, PAN also suggests that both the hydrocarbon and electricity sectors should remain considered "priority" industries under the terms of articles 25 and 28 of the constitution, and that the administration of oil rent should remain considered as a "strategic" area—that is, solely controlled by the state.<sup>12</sup> PAN's Petroleum Fund proposal explicitly mentions Norway's "Government Pension Fund Global" as a reference model. The fund must benefit from an independent budget, patrimony, and regulatory mechanism, and its operations and decisions must be transparent and accountable to the Mexican Congress. This fund would be entitled to make monetary transfers to the Ministry of Finance, and to protect Pemex and other companies from the predatory fiscal practices of government agencies. In order to avoid a major financial crisis in government expenditures, a phase-in period of 10 years is suggested for implementing the full fiscal operations of the fund.

Under the same token, PAN proposes to empower the CNH and the Energy Regulatory Commission (ERC) as independent and accountable bodies, similar to the Petroleum Fund. The CNH would have the authority to grant, regulate, and manage the concessions in the oil and gas sectors, and the ERC would hold the same functions in downstream operations and in the

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<sup>12</sup> Similar to PRI's proposal, PAN's draft bill also considers the national electricity grid and its operation as a strategic domain.

generation of electricity. All three independent bodies must incorporate seven commissioners each, recruited from expert professionals not working as public officials or benefiting from political positions.

PAN's constitutional amendments aim to delink Pemex and the entire energy sector from the budget of the Ministry of Finance creates new independent budgetary and administrative regulatory bodies at the constitutional level for monitoring and disclosing the amount of the accumulated oil income, i.e., once Pemex's or private contractors' profits are discounted. PAN also calls for a more rigorous and transparent process for granting concessions, empowering both CNH and ERC as regulatory bodies for supervising the operations of firms in the oil, gas, and electricity sectors. Needless to say, a strong and autonomous regulatory body overseeing the accountancy and disbursement of the oil rent ought to be a watchdog agency to combat and denounce the widespread corruption currently prevailing in Mexico's energy sector.

Last but not least, PRD is the party that openly opposes any constitutional amendment. They agree with both PRI and PAN that the energy sector requires a major transformation in order to make it more transparent and competitive. However, PRD believes that all necessary transformations, including Pemex's independence from the Ministry of Finance, can be reached by modifying administrative legislation. In other words, PRD opposes ending the marriage between oil monopolism and resource nationalism that has prevailed in the Mexican energy industry since the 1960s. Nonetheless, PRD's energy proposal calls for a transformation of the existing Petroleum Revenue Stabilization Fund (PRSF), initiated in 2000 to create a saving fund fed by windfall profits. The whole idea was to use this fund as a countercyclical policy tool in order to cushion shocks coming from a downturn in international oil markets.<sup>13</sup> PRSF is different from the Mexican Petroleum Fund proposed by PAN inasmuch as the former solely collects windfall oil profits, that is, revenues above the budgeted international oil price anticipated by Congress when voting on the government's annual budget. What PAN suggests is creating a new fund that is constitutionally autonomous—which is not the case under PRD's proposal—and entitled to collect and allocate all revenues from the oil and gas sectors.

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<sup>13</sup> There is evidence, however, that the resources of the fund have been used for all kind of purposes, even for supporting normal government expenditures, despite the fact that from 2000 to the present, international oil prices have been above the anticipated price budgeted by the Ministry of the Treasury (see Moreno 2006, 22-23).

## Consequences of Political Trends for Future Development

### *Will Mexico Become a “Gas Powerhouse” in the Long Run?*

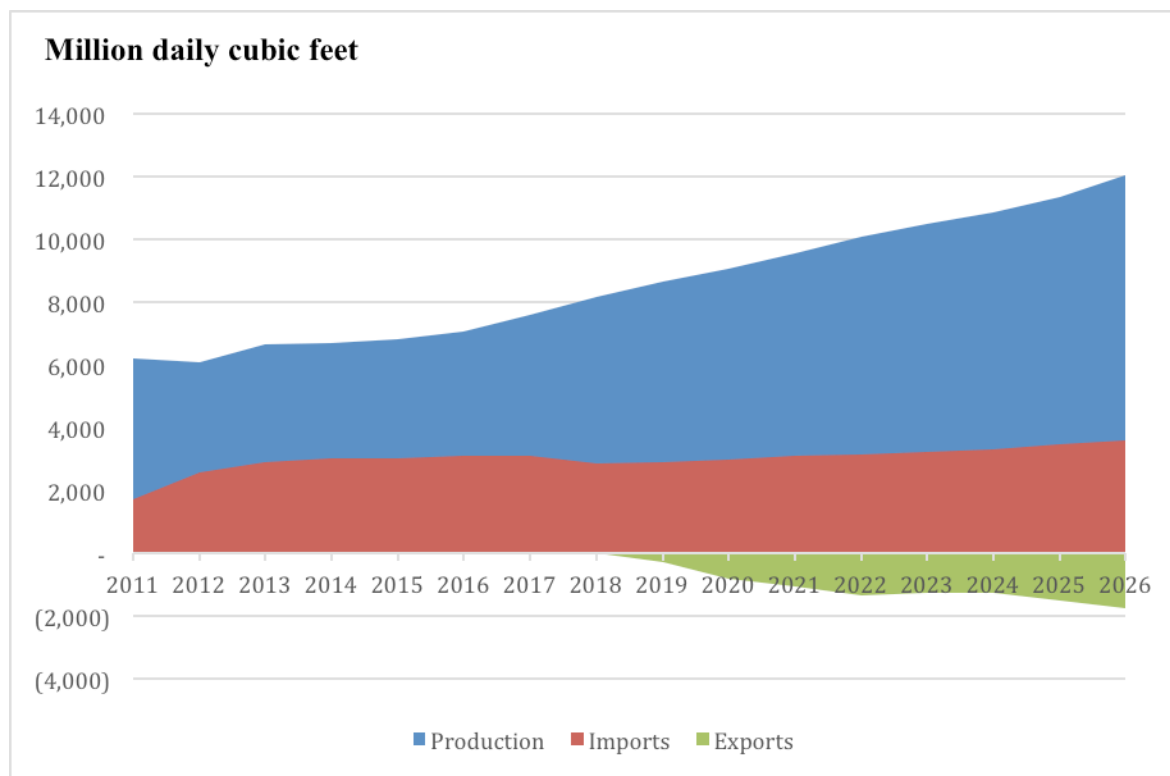
When President Peña submitted his energy bill to Congress, he anticipated that opening the energy sector to private participation would increase crude oil production from 2.5 MBD to 3 MBD by 2018 and 3.5 MBD by 2025. As for natural gas, production would go from 6.6 billion daily cubic feet (BDCF) to 8 BDCF by 2018 and 10.4 BDCF by 2025. Indeed, these targets are very similar to the production estimated during the last year of President Calderon's administration, when he called to increase Pemex's investments up to \$27.2 billion until 2026 (SENER 2012b, 37-38). In 2011, however, Pemex's investment in exploration and production was \$16.864 billion (Pemex 2013, 7), already a record compared to the figures of the past decade. Needless to say, the targets envisioned by the present administration assume that the energy sector will be opened to private firms, and that the incorporation of new, fresh capital and technology will achieve the anticipated figures. In other words, the ambitious scenario envisioned at the end of the past administration could be feasible if the opening of the energy sector is successful.

Figure 4 reproduces the last “optimistic” forecast by SENER at the end of the past administration. The estimations are very similar to President Peña's optimistic targets under a potential new energy scenario. In this forecast, domestic demand increases to an AARG of 3.8 percent for the whole period from 2011 to 2026. The rate of growth is higher from 2012 to 2018 (4.9 percent) than in the years thereafter (3.1 percent), reflecting high rates of consumption in the electricity and industrial sectors (SENER 2012a, 145, 162-163). These figures are consistent with historical trends (see Figure 1), which show that demand for natural gas has been progressively growing. During President Peña's presidential term, growth will be higher than past trends, putting pressure on production, which grows at an AARG of 4.5 percent. In the year 2023 domestic production reaches 10.490 BDCF, the figure that President Peña is targeting for 2025. However, under this scenario, despite the fact that production grows at higher rates than the historical record, net imports are still needed to fulfill demand pressures. The message of this forecast is clear: if growth in domestic production is desired and anticipated, it will be done in order to cope with an anticipated increase (higher than in the past) in domestic demand, but it

will not make Mexico a major exporter of gas. By contrast, increasing oil production from 2.5 MBD to 3.5 MBD will not only satisfy domestic needs, but it will also boost petroleum exports as a means of maximizing Mexico's oil rent, a "strategic" target of the upcoming reform.

During the last year of President Calderón administration, it was anticipated that a new stream of shale gas, scheduled to start in 2016, would support the increase in domestic production. Though Peña's energy initiative recognizes the potential of non-conventional gas resources, there is yet no official, public target date for the start of production from those plays. Since almost two-thirds of Mexico's gas stock is associated with oil, a boost in domestic production could come either from the offshore reservoirs or onshore in the northern part of the country, mainly from Chicontepec, where hydrocarbon recovery has proved to be lower than anticipated. If new companies are allowed to invest in this area—bringing new capital, know-how, and technology to exploit a basin that some considered to be non-conventional—gas output from this region could increase.

**Figure 4. Scenario of Gas Production, Imports, and Exports—Mexico, 2012-202**



Source: SENER, 2012

Growth in domestic gas production could eventually come from shale plays located in the Sabinas and Burgos basins. However, the current success in the development of shale gas in the United States will determine the development of shale plays south of the border. The US Department of Energy estimates total US recoverable shale gas reserves at 665 TCF (EIA 2013, 10). This will continue to push prices downward, as is happening currently, until around 2023, and will also increase domestic supply for the power sector, abate net imports, and increase exports. LNG exports are anticipated to start in 2016, and the United States could become an overall net exporter of gas by 2021 (EIA 2012, 9).

Additionally, the fact that one of the most promising shale gas plays is located in Eagle Ford in southern Texas lets one suppose that anticipated imports of LNG coming into Mexico could be substituted by cheaper shale gas produced at the border. The impact of shale gas surpluses coming from the US is difficult to assess for now, since China is already investing in the Eagle Ford area in order to meet anticipated growing imports of this fuel (Foster 2010; Hartke 2010), and Mexico still experiences bottlenecks when increasing its cross-border imports. The major impact of the energy revolution taking place in the US on Mexico's energy sector is the contrasting outlook of the Mexican situation compared to that prevailing in her northern neighbor. This situation bolsters arguments by both PRI and PAN supporters advocating for a major energy reform.

#### *Economic and Infrastructure Challenges to Overcome*

The major economic challenge facing the development of Mexico's shale potential is the opportunity cost of exploiting conventional versus non-conventional resources. Since Pemex aims to optimize the oil rent, a mandate that was ratified by Peña's Pact for Mexico and his energy bill, most of its investments are concentrated in the development of oil fields, either onshore or in shallow and deep waters. At present, Pemex's production cost per barrel ranges from \$4 to \$40, depending on whether the extraction is done in mature wells or in deep waters. At an average price of more than \$70 per barrel for the Mexican mix, oil production and exports are highly rewarding if needed to maintain growing revenues. By contrast, producing one barrel of shale gas equivalent to oil costs Pemex between \$9 and \$18, while the equivalent international

price of the same barrel is around \$21 in the North American market.<sup>14</sup> The opportunity cost for Pemex to give priority to non-conventional gas is, so far, too high.

Indeed, international gas prices—at least in the North American region—have been decoupled from oil, depicting the rapid growth of the gas supply coming from American shale plays. Currently, prices remain below \$4 per million British thermal units (MBTU), as witnessed by Mexico's reference market, the so-called Henry Hub. Though Mexico's Ministry of Finance still maintains subsidies electricity and many fuels (gasoline, diesel, and liquefied petroleum gas) natural gas prices are pegged to Henry Hub.<sup>15</sup> However, retail prices reflect the transmission and operation costs charged by private utilities in the industrial, business, and residential sectors. Since subsidies are non-existent, natural gas must unfairly compete with subsidized fuels such as diesel and liquefied petroleum gas, whose consumption remains important in the residential, business, and agriculture sectors. If the domestic market for natural gas is expanded, subsidies for competing fuels (which have proved to be regressive) must be suppressed in order to level the playing field. According to the policies announced in the Pact for Mexico, regressive subsidies in the energy sector will be curbed.

A second major economic constraint for developing non-conventional gas fields is the high production costs for Pemex compared to other companies already exploiting shale plays in the United States. Table 1 compares development costs per well between Pemex and other companies in similar shale plays. While costs per well at Eagle Ford range from \$4 to \$6.5 million, the Emergente well, a shale well already developed by Pemex in a geological formation similar to Eagle Ford, reached \$11.9 million—almost the double the cost in Texas. Besides the huge cost differential, Pemex must internalize within its operations the cost of using 4 million gallons of water per well (equivalent to 15,000 cubic meters, approximately) plus other industry safety requirements to be developed by Mexican agencies for exploiting non-conventional resources (SENER 2012b, 42).

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<sup>14</sup> Data disclosed by the Director of Pemex, Emilio Lozoya (2013).

<sup>15</sup> Though natural gas prices are not subsidized, they are subject to regulatory measures enforced by Mexico's Energy Regulatory Commission (ERC). During the second half of the past decade, for example, when international prices were highly volatile, the ERC set caps according to different markets consuming natural gas. Prices are being reviewed on a five-year basis (SENER 2012a, 49-50).



**Table 1.**

<b>Play</b>	<b>Cost per well (million dollars)</b>
Eagle Ford	4.0 to 6.5
Marcellus	3.0 to 4.7
Barnett South/Western Counties	1.6 to 3.7
Barnett-Woodford	6.5
<b>Emergente-1 (Pemex)</b>	<b>11.9</b>

Source: EIA 2011b and Pemex

Last but not least, there are infrastructure bottlenecks to overcome in order to develop the full potential of Mexican shale plays. After the implementation of NAFTA, the transportation, distribution, and storage grid became open to private participation. However, at present, only 15 percent of the national grid is in private hands. This means that consumers must pay a different transmission fee depending on whether natural gas is transported by the Pemex grid (normally at a cheaper rate) or by private pipelines. Currently, consumers using the latter grid usually pay higher transmission fees, discouraging the construction of new pipelines by private investors.

During his last year in office, President Calderón called for an increase of the transmission grid from the current length of 11,542 kilometers to 15,916 kilometers—an increase of 38 percent, requiring additional investments of \$7.9 billion. To do so, Mexico's Energy Regulatory Commission (ERC) is implementing a new regulatory framework for establishing transmission prices; roll-in pricing will dominate the overall transmission grid, regardless of whether it is administered by Pemex or by private utilities (Salazar 2012).

### **A Policy Scenario for the Foreseeable Future**

Though the PRI and its coalition with the PVEM (Partido Verde Ecologista de México, a so-called green party) control a higher amount of seats than any other party in both the lower house and the senate since the July 2012 elections, no single party or political coalition has a majority in congress. Passing bills—either by simple majority (as is the case with most of the current

reforms) or by a two-thirds majority of congress (in case of constitutional reforms, such as President Peña's energy bill, which also must be passed by the majority of state's legislatures)—requires bipartisan coalitions, as envisioned in the Pact for Mexico. As a previous section of this paper explains, both PRI and PAN positions coincide on the core of the energy reform, i.e., ending state monopolism and opening to private participation most of the production chains of the hydrocarbon and power industries. PAN's position is more comprehensive and cautious; it advocates for the creation of autonomous bodies for scrutinizing and managing the oil rent and for bidding concessions or granting permits in upstream and downstream operations and in electricity production. A PRI-PAN coalition could easily pass a reform of that sort, both in the federal congress and in most of state's legislatures. Nonetheless, the discussion and passing of the reform has been delayed and heavily politicized, since PAN is exacting a price for its support—the negotiation of other bills that it favors, such as major tax increases and a “political reform” that could serve PAN's interest in promoting the reelection of deputies and majors.

Having said that, I assume that the energy bill will be passed either at the end of 2013 or during the first semester of 2014, when the Mexican congress resumes in February. I also assume that the core of the reform will pass as well—the amendment of articles 27 and 28 of the Mexican constitution, allowing for private participation in almost all production chains of the hydrocarbon and petrochemical industries, as well as in power generation. The legal structure that will govern private contractors' participation in Mexican industries (either by contracts or concessions, or both) will be part of the remaining debate, as well as the institutional architecture for dealing with the extraction and use of the oil rent and the new regulatory body that emerges under one of the following policy scenarios, in which Pemex becomes a state firm that must compete against other firms. The rest of this section explores some possible scenarios that this historic liberalization of the energy sector could unleash.

- i) *The upcoming bundle of regulatory bills.* The transformation of Mexico's energy sector is about to start. The constitutional amendment will be the first move of a major change, and the definitive architecture of this change will be defined by the current and the following presidential terms. If private firms participate through contracts, the nature and scope of those contracts must be clarified and regulated. If Congress finally

decides to grant concessions, what model should be adopted? In the years to come, Congress will be busy drafting and discussing new regulatory legislation in order to build trust and transparency in energy operations for both investors and the general public. PAN's call to create independent bodies, such as the Mexican Petroleum Fund or an empowered CNH and ERC, will remain important points in the reformation agenda. A fiscal reform aimed at transforming Pemex into a company with net profits is already in the pipeline, as well as opening the sector to private participation in refinery and distribution. The modification of administrative and regulatory legislation will certainly expend much of the current administration's political capital, since other major non-energy reforms are being negotiated simultaneously. The "path dependence" of the changes witnessed in the energy sector will be intertwined with other policy changes introduced in public safety, education, taxation, social security, and poverty alleviation.

- ii) *The evolution of Mexico's oil and gas production.* The policy target for the next five years (up to the end of Peña's presidential term) is to elevate crude oil production—without including condensates—to 3 MBD and gas to 8 BDCF. Previously, Pemex was constrained from reaching this goal by issues of technology access and fundraising. Once the energy bill is passed, this won't be a problem, but the challenge will be building the right regulatory environment to attract the right investors for the right basins. As previously stated, the opportunity cost for Pemex or for the state to move from exploiting new oil resources associated with gas to exploiting non-conventional gas is too high. Consequently, the priority areas opened for private competition will be mainly in the deep waters of the Gulf of Mexico, where the risks are high, or onshore northeast Mexico, in the area around Chicontepec. Most new oil and gas ventures will come from those areas and not from non-conventional plays in the next five years.
- iii) *The future of shale gas.* In contrast with the last year of the past administration, the development of shale gas is not the flagship of the current administration's energy reform. However, since the rationale behind the reform is to increase production and reduce energy prices, some plays located in the Sabinas or Burgos basins will probably be opened to private exploration or exploitation. Companies already working in the

Eagle Ford play in Texas could be attracted south of the border to participate as new contractors. As long as gas prices remain low in North America, Mexico will have no interest in becoming a major exporter, as probably will be the case with the US and Canada. During the last year of the past administration, when the development of shale plays jumped to a high priority, members of the CNH and key senators of the PRI engaged in energy policy<sup>16</sup> demonstrated their preferences for creating a new NOC geared to the exploitation of shale gas and non-conventional hydrocarbons. They agreed that the fiscal regime and the corporate governance currently prevailing in Pemex work against the efficient exploitation of non-conventional resources. Once upstream operations are liberalized to allow private participation, the possibility of creating a new NOC for the exploitation of shale gas will become feasible. The new company could be created in association with another private company that already has expertise in non-conventional gas development and exploitation. Experts attached to the CNH believe that under current circumstances, it makes sense to develop non-conventional gas resources if a firm—i.e., a new NOC in association with private investors—is successful in recovering natural gas liquids, which might be priced and traded as gasoline. At any rate, Mexico still needs new regulatory and environmental legislation for ensuring public safety and reducing industrial and environmental externalities in the exploitation of non-conventional oil and gas resources.

- iv) *The future of gas production and demand.* Since gas will remain a strategic fuel in power generation and Mexico's economic growth is anticipated to increase, domestic gas demand will probably expand at a rate in the range of 4–5 percent annually during the next five years, as in the scenario presented earlier in this paper. The evolution of demand will depend not only on the future of economic growth but also on the large opportunity for energy savings in Pemex and CFE, a policy that started during the past administration and that the current one is committed to continue. As for production trends, an increase above the historical record is anticipated if the state and/or the new created regulatory body is successful in attracting capital and investors to develop wells in deep waters in the Gulf of Mexico and from enhanced recovery in shallow waters and mature oil fields. Thus, imports will probably increase in the near future,

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<sup>16</sup> Interviews conducted by the author.

following recent trends, since infrastructure constraints will continue to hamper the full development of gas markets (see Figure 4).

- v) *The evolution of the regulatory framework for developing a domestic gas market.* The enlargement of the gas grid is crucial for the development of Mexico's domestic gas market. Hence, the ERC—whether it is strengthened by energy reforms or not—needs to craft a new regulatory price regime in order to give incentives to increase domestic consumption and encourage private investment in pipeline capacity building. This will probably be one of the major policy goals of both ERC and SENER during the current administration.
- vi) *The future of gas prices and shale plays in the United States.* If natural gas prices remain decoupled from and lower than oil prices, it makes sense to increase imports from the US, instead of paying for LNG from overseas markets at much higher prices. However, due to constraints in infrastructure development for cross-border trade, imports of LNG will increase in the short terms, as during previous years. This trend will definitely dampen the development of Mexican shale gas plays but will create pressure to improve infrastructure—which, in the long term, will be beneficial for consolidating a domestic market.
- vii) *The evolution of the renewable energy share in electricity generation.* Part of the reasoning for opening the power sector to private investors is to increase the share of renewable energy in electricity generation, still heavily dependent on fossil fuels. New legislation mandates increasing this share to 35 percent by the year 2024, though the mechanisms to reach this goal are yet to be defined. Most likely, this will become a contentious issue in the years to come, especially for environmental protection associations calling for stricter enforcement of mandatory use of renewable resources if the production of non-fossil fuels increases in the country.
- viii) *The speed and depth of Pemex fiscal transformation.* As stated in the tripartisan Pact for Mexico, Pemex will remain a NOC but under a new mandate: to become “productive,” which in industry jargon means becoming a firm that creates value and profits (currently, Pemex is a sort of agency for transferring income to the government). In order to move Pemex in this direction, a new fiscal regime for the company is needed, the goal of which should be to tax profits and/or establish royalties

on Pemex windfalls. Currently, the NOC faces a permanent deficit because the oil rent is completely squeezed by the government. In order to compensate for the reduction of Pemex transfers to the treasury, the Ministry of Finance must launch a radical fiscal reform enlarging the pool of taxpayers. Luis Videgaray, currently the head of the ministry, has realized that advancing such a contentious reform will strain the resiliency of the pact. At the time of writing, Pemex fiscal reform was not even discussed when Congress divided along partisan lines in the discussion of new taxes to increase the government revenues for the next year. If Pemex is to compete on equal basis with private firms, a new fiscal regime for the company is urgently needed.

- ix) *The speed and depth of Pemex corporate transformation.* During his presidential campaign, Peña praised Petrobras as a model of corporate governance in the oil sector. If Pemex follows that model, it could eventually accept the participation of private capital as part of its assets and engage in joint-venture operations upstream and downstream. The reform seeks not to privatize Pemex but to make it more competitive by opening the overall energy sector to private participation. It is anticipated that Pemex will keep the right to use and exploit the current fields and wells where it is currently operating. But a radical transformation of the company is necessary for the company to survive in an environment that will become more and more competitive. The faster a “new” Pemex can adapt to this changing environment, the sooner it will become a world-class state oil company.
- x) *The future of downstream.* The Pact for Mexico also outlined the creation of a “competitive environment.” As the past administration failed to do this, private companies could be involved in the construction and operation of new refineries, as well as in the construction of pipelines for shipping oil and products from the production sites to major consumption centers located in the northwest. To accomplish this, secondary legislation should be modified and the ERC should be strengthened and entitled to more autonomy vis-à-vis the Ministry of Finance.



## Conclusion

Almost 20 years after NAFTA began, North American energy markets have become more integrated and are witnessing a sudden transformation that is impacting world energy markets. Canada is currently ranked in third place in terms of proven oil reserves and is a major net exporter of oil, thanks to the oncoming stream of huge tar sands resources. Canadian production could rise above 6 MBD in 20 years. The United States is witnessing a gas revolution that has already impacted world gas prices, driving this country to become a net gas exporter in just seven years. This is prompting Canada to find new overseas outlets—mainly in Asia—and Mexico to decide whether to rely on cheap gas imports from its northern neighbor or to set the right policy environment for developing the country's conventional and non-conventional gas potential in the years to come. Furthermore, US domestic oil production is rapidly increasing thanks to the development of new tight/shale oil resources, and liquid fuel consumption is about to witness a major transformation if markets for hybrid and electric vehicles are consolidated. With the help of technology and geology, the US could become an energy self-sufficient country in the span of 20 years.

Within this regional context, Mexico is about to put an end to the state oil monopoly regime that grew in conjunction with resource nationalism, both grounded in the narrative of the Mexican Revolution, which influenced the values, expectations, institutions, and practices of the country's political and social life throughout the twentieth century. If the monopoly regime comes to an end, as is likely, national and international private firms will be allowed to invest and participate in all chains of Mexico's oil, gas, and power industries, transforming the energy industry in a way that was unthinkable when NAFTA was launched.

Post-NAFTA energy reforms traditionally attempted to widen the scope of private participation in Mexico's energy sector in order to increase competition without modifying constitutional mandates. By modifying the existing regulatory legislation, the Mexican state widened the scope for private firms' participation in areas that could be better exploited by them, such as electricity generation and gas transmission, storage, distribution, and foreign trade. However, post-NAFTA energy reform also polarized Mexico's political class and society between those advocating for

reform (denounced as “privatizers” by their detractors) and those defending the status quo (who labeled themselves “nationalists” or “sovereignty-keepers”). This polarization made it difficult to launch a real debate about the policy options for coping with the main challenges of the energy sector in Mexico. By framing any reform initiative as a challenge to Mexico’s sovereignty, Congress and other political actors sought to preserve a risky status quo and postpone the changes needed to develop Mexico’s full energy potential.

In this sense, the energy reform announced by President Peña in June 2013 comes as a breakthrough compared to previous attempts to transform Mexico’s energy industry. President Peña’s proposal directly challenges the monopoly regime that exploits and manages energy resources in Mexico. The overall proposal attempts to decouple resource nationalism—which must remain a constitutional principle in the governance of subsoil resources—from state monopolism in the hydrocarbon and electricity sectors. It would open to competition all the value chains of these industries without alienating the sovereign ownership of resources. However, opening the value chains of the hydrocarbon and power industries to allow competition is not a magic key guaranteeing their revival. It is equally urgent to make Pemex an independent and competitive firm and to build strong public regulatory institutions, independent from the interests of the Ministry of Finance, consisting of government and partisan officials who are capable of monitoring and protecting the extraction of the oil rent that state and private companies will continue to generate. If the present reform sets the groundwork to “renationalize” the oil rent—currently in the non-transparent hands of partisan interests and political cliques—for the benefit of the nation, it will mark a milestone in the history of the Mexican energy industry.

Due to the vast amount of prospective oil and gas reserves, Mexico will remain a major oil and gas reservoir (of both conventional and non-conventional resources) for North America and the world. What is currently at stake in the Mexican energy landscape is to design a new institutional architecture that will realize the country’s full potential by ensuring the “maximization” and “renationalization” of the oil rent through autonomous and accountable regulatory bodies, building the right policy environment to make the participation of private firms—either national

or international ones—legally certain and transparent, and unlink Pemex from the public budget to make it a more competitive state firm with the potential to become a world-class oil company.

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