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Mexico's Energy Reform:

Ready to Launch

By David L. Goldwyn, Neil R. Brown, and Megan Reilly Cayten

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Foreword

Just over eight months ago—and one day after congressional passage—the Adrienne Arsht Latin America Center released a landmark report on Mexico's energy reforms. The constitutional changes served as the precursors to legislation that would implement sweeping energy reform in Mexico.

The December report, *Mexico Rising: Comprehensive Energy Reform at Last?*, had a poignant question mark at the end of its title. This second report on Mexico's energy reform no longer has any need for a question mark. The government of Enrique Peña Nieto has provided the country with a legislative energy infrastructure designed to encourage business, increase transparency, and lower costs for citizens.

Mexico's oil has long been the third rail of the country's politics. Although unwilling to open up the hydrocarbons sector to foreign and private investors in a large-scale way, the Mexican government searched for solutions to increase production while keeping the constitutional ban against foreign investment in the upstream in place. These included smaller scale reforms in 2008, allowing for private companies to enter into incentivized service contracts with Petróleos Mexicanos, the state-owned oil and gas company, while not allowing them to acquire direct shares in projects or derive profits from production.[1] Still, Mexico was caught in a trap where the oil income so critical to government expenditures continued to dry up. The economy lost jobs and income opportunities.

President Enrique Peña Nieto took a bold step in leading the *Pacto por México* to change that. Governments worldwide would be wise to note how the *Pacto*, an alliance of the three major political parties in Mexico, established an agreement whereby each party committed to making the sacrifices necessary to address some of the most pressing issues facing the country. Though, in the end, energy reform unraveled the *Pacto*, two of the three parties forged ahead and enacted this important reform. First constitutionally, and now in the legislature.

This report illustrates what Mexican energy reform means both for Mexico and for energy worldwide. The new laws promote transparency and collaboration, establish legitimate regulators and promote a business-friendly environment.

In our last report we posed questions about what the secondary legislation would need to contain so Mexico could fully benefit from the constitutional reform. We now address those questions by looking at the secondary legislation, and establishing benchmarks of success for its implementation. Given Mexico's accomplishments in enacting reform across not just the energy sector but also in telecommunications, electoral systems, education, and the tax system, we are optimistic that the country will see enormous benefits. Energy reform is a game-changer for Mexico's role in the global economy. It will modernize the country, accelerate foreign investment, and improve the lives of its people.

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Executive Summary

Mexico is poised for an energy renaissance. It has ample reserves of oil and natural gas, experience in energy production, promising economic fundamentals, and industrial expertise. In recent decades, Mexico has suffered from declining oil production, insufficient gas supply, and high electricity prices.

The fundamental obstacle to Mexican energy development was mustering the political will to allow the country access to the expertise, technology, and capital needed to open new energy frontiers. Mexico's leaders have now decisively found the will to reform and passed a set of laws that can transform Mexico into a major energy and industrial power.

The initial, constitutional-level reforms, discussed in our first report, *Mexico Rising: Energy Reform at Last?*, passed on December 18, 2013.[2] This constitutional framework has been translated into law with the signing of twenty-one implementing, or secondary, laws impacting oil, gas, power, and energy finance on August 11, 2014.[3]

Rather than political score settling upon election, President Enrique Peña Nieto chose a path of collaboration and governance for his administration and the *Partido Revolucionario Institucional* (PRI). He found willing partners in Mexico's principal opposition parties, the *Partido Acción Nacional* (PAN) and the *Partido de la Revolución Democrática* (PRD), and forged the *Pacto por Mexico*.[4]

Constitutional and then major legislative reforms in education, fiscal structure, telecommunications, and electoral law were passed, weathering the headwinds of the PRD's departure from the *Pacto* over energy and an internal leadership debate within the PAN as to whether collaboration was the right path to follow. In energy, the PRI and PAN avoided the easier path of incremental adjustment for the harder but necessary path of constitutional-level change. Our first report asked: would Mexico undertake "energy reform at last?" We have now dropped the question mark. With the midterm elections less than a year away, the political alliance that achieved this historic success is understandably fraying. But, the legal fundamentals are now in place, and the Peña Nieto administration is ready to launch their implementation.

The secondary laws provide a compelling framework for growth across the energy sector. The vital upstream oil and gas reforms will allow private investment alone and alongside national champion Petróleos Mexicanos (PEMEX). While the reforms provide that hydrocarbons in the subsoil will remain the property of the Mexican state, companies can book reserves for financial reporting purposes and enjoy competitive licensing frameworks to access what promises to be robust auctions of deepwater, tight formation (or

Mexico's leaders have passed a set of laws that can transform the country into a major energy and industrial power.

Mexico's quality of governance now places it at the top of class of emerging economies.

unconventional) heavy oil and shallow water acreage. Mid- and downstream operations (pipelines, storage, petrochemicals, and motor fuel stations) will be opened to competition as well. New independent operators will foster competition in gas markets under supervision of a new regulator for the management of gas pipeline planning and access (National Center for Natural Gas Control—CENAGAS), while a reformed Energy Regulatory Commission (CRE) will be responsible for market regulation. The electricity law should, within two years, create a competitive power market managed by an independent system operator (National Energy Control Center—CENACE). This new regime will include incentives for private capital to build new lower-carbon generation systems that welcome private investment in transmission and distribution under contract to the national power company, the Federal Electricity Commission (CFE). New laws[5] governing PEMEX and the CFE convert these former monopoly players into what the constitutional reforms term "state-owned productive enterprises,"[6] with substantially more independence but also subject to competition with private investors.

It remains undetermined how attractive Mexico's offerings will be, especially in upstream oil and gas, until these contracts, their fiscal terms, the local content targets, and the quality of the acreage offered for development are known. The government will need to promulgate regulations fast and well if bid rounds are to be launched in the first half of 2015.

Much of the analysis on the reforms to date focuses on the upstream. However, the political and economic implications of success in the mid-stream and power sector reforms justify the detailed analysis provided here. The political sustainability of the reform relies on broad-based economic growth. This growth is tied to increased adoption of natural gas in Mexico's energy mix. Allowing market pricing of gas should increase supply and expedite the large-scale conversion of oil-fired power plants to natural gas, the build out of gas distribution infrastructure, and the provision of lower-cost electric power. Increased natural gas supply is critical to meeting future energy demand, lowering power prices, lowering carbon emissions, decreasing the Mexican government's considerable power subsidy obligations, and expanding Mexico's industrial base.

Investor confidence that this transformation will take place will enable Mexico to quickly attract the capital necessary to spur near-term macroeconomic growth long before oil and gas flows appreciably increase. Mexico's quality of governance now places it at the top of class of emerging economies.

Mexico is "ready to launch" these reforms. President Peña Nieto has signaled his keen awareness of the need for speedy implementation with the announcement of a rapid action implementation plan (see sidebar), or Energy Decalogue, the day after the secondary laws were signed. Those announcements accelerated both the results of the Round Zero, which were revealed over one month ahead of schedule on August 13, 2014, and the preview of the Round One opportunities.

The success of the reforms now rests squarely on these implementation decisions. It is a formidable task requiring a level of administrative speed and savvy that would challenge any government, but over the past twelve months Mexico has shattered

expectations. That gives confidence that these reforms will succeed. This follow-up report, which draws upon extensive conversations with Mexican officials and commercial players, examines the political context in which these energy reforms were launched, assesses the primary reforms sector by sector, and, finally, reviews the impact they are likely to have on Mexico, the United States, and global energy markets.

RAPID ACTION IMPLEMENTATION PLAN
Mexican Energy Reform Moving Forward: Ten Key Steps

1	PEMEX's Round Zero has been expedited. The Secretariat of Energy (SENER) announced on August 13, 2014, the assignment of exploratory areas and production fields that PEMEX will be able to retain, although the law gave the agency until the second half of September to make the decisions.
2	Round One. The areas which will be part of the first round of the public bidding process will be announced expeditiously so that domestic and foreign private investors can begin their due diligence. The bidding process will begin in 2015. PEMEX has already announced the first areas in which it will seek joint venture partners.
3	Before the end of August, decrees will be issued for the creation of CENACE and CENAGAS—both decentralized agencies under SENER—to consolidate the electricity market and introduce the new model for the natural gas industry.
4	Before the end of August, the Senate will receive the names of candidates for all new regulatory bodies, independent directors of Pemex and CFE, independent members of the Mexican Petroleum Fund for Stabilization and Development, and commissioners for the National Hydrocarbons Commission and the Energy Regulatory Commission. The boards of PEMEX and CFE will also be installed.
5	In September, the Mexican Petroleum Fund will be created, and decrees will be issued for the formation of the public fund, to promote the development of suppliers and contractors of the SENER-NAFINSA Fund, to advance state involvement in production projects, and to create the Universal Electrical Service Fund.
6	The program to train specialists in the energy sector will begin, with the participation of SENER, the Secretariat of Public Education, and the National Council of Science and Technology.
7	In October, the set of initial, higher-level regulations related to the secondary energy law will be published, to allow time and full legal certainty for new investments in the sector.
8	In October, a decree will be issued to restructure and modernize the Mexican Petroleum Institute, and to strengthen its mission as a national body for research and development of the industry.
9	In October, the guidelines for the issuance of Certificates of Clean Energy will be published with the necessary incentives for the development of these sectors.
10	In the following 90 days, regulations will be issued for the National Industrial Safety and Environmental Protection Agency, to ensure the sector complies with the best international practices in the field of industrial safety and environmental protection.

Source: El Universal

Political Context

A structural change of Mexico's energy sector first required the once unthinkably high political hurdle of amending the Mexican constitution. Mexican President Lázaro Cárdenas nationalized the hydrocarbons sector in 1938, and the notion of inviting foreign investment into the sector was political heresy for decades. Although the more tentative 2008 reforms allowed private investors to work with PEMEX as subcontractors under a new form of incentivized service contract, the constitutional ban against their direct participation in the hydrocarbons sector through acquiring direct stakes in projects remained in place.

These dramatically more expansive initial, constitutional-level reforms required approval of two-thirds of the federal legislature and ratification by a majority of state legislatures. Mexico amended articles 25, 27, and 28 of its constitution and, along with the transitory articles that interpret them, established the framework to reform PEMEX and CFE, allow private participation in the sector, and protect the ongoing position of Mexican state-owned energy champions.[7]

The second step was the adoption of federal secondary laws, requiring a majority vote. The vibrancy of Mexico's democracy was seen throughout the process. Having met the constitutional hurdle in 2013, the secondary laws were challenged by the opposition of the PRD; the tactical maneuvering of the PAN; the revelation of a corruption scandal wherein the Mexican oil services firm Oceanografía allegedly defrauded Banamex, the Mexican unit of Citigroup, of around $400 million; and public expectations of economic improvements before the reforms had even passed.[8]

Real energy reform required gripping tightly to the third rail of Mexican politics: allowing private sector investment in oil. The reforms were strategically passed at the end of the legislative queue in 2013 and led the PRD to leave the *Pacto*. The PRD objected to the diminished role of PEMEX and CFE, arguing that reforms will benefit foreign companies more than the Mexican people, that reform momentum outpaced public consultation, and that the responsibilities of the reforms will outstrip Mexico's regulatory capacity.

The PRD is pushing for a referendum on the reforms to take place in July 2015 during Mexico's midterm elections. The prospect of a referendum has introduced some risk to potential investors; however, any such referendum would have to muster Supreme Court approval to proceed. Analysts in Mexico (and indeed the government) are confident that the Supreme Court would rule against a referendum because the laws are essentially revenue measures for the government, thus not subject to a referendum under Mexico's constitution.

The PAN delayed deliberations on the secondary laws multiple times through the spring and summer of 2014. One delay occurred while it deliberated party leadership, and the party ultimately reelected leaders who favored cooperation over conflict with the PRI. Other delays were over PAN insistence that electoral reforms pass key states, bolstering the party's competitiveness at the local as well as national level, before energy laws were adopted. The PAN's commitment to ensuring a pro-investment climate, however, produced tangible changes that likely will speed the pace of reform in PEMEX and in attracting private capital.

The Peña Nieto administration is navigating an enormously difficult domestic political environment. Peña Nieto's approval rating has plunged to 37 percent since his inauguration due in large part to weak Mexican economic growth.[9] As a candidate, Peña Nieto pledged in 2012 to achieve 5-6 percent annual GDP growth, but Mexico's economy grew by only 1.1 percent last year.[10] Commanding party discipline is a task at these levels; achieving multiparty support is heroic.

Some observers see the PRI as risking significant losses in the July 2015 midterm elections, further circumscribing Peña Nieto's freedom of action. Additionally, the basic reality of Mexican nationalist sentiment around oil has not yet fundamentally changed, distrust of political leaders is high, and corruption and fraud remain significant concerns. Given these challenges, Peña Nieto's commitment to pursuing structural reforms that have long-term strategic benefits and short-term political costs is deeply admirable.

Mexico's response to the legacy of corruption has been to design one of the most transparent oil and gas sectors in the world. Those measures range from the creation of the Mexican Oil Fund described in our first report[11] to requirements for electronic publication of data. In particular, Mexico's Secretariat of Finance and Public Credit (Hacienda) is required to electronically publish details of contracts and specific payments it and the Mexican Oil Fund receive. Transparency and regulatory protections against corruption are also built into the legal framework. PEMEX, for example, is not allowed to choose its own private partners to help it develop its existing acreage and instead must undergo auctions. The laws also include stiff penalties for acts of corruption.

Transparency and regulatory protections against corruption are built into the legal framework.

It should be appreciated, especially by those in the United States weary of short-sighted politics, what a remarkable act of political bravery Peña Nieto has undertaken. The major benefits of the energy reforms are likely to come late in his *sexenio* (or the one, six-year term to which Mexican presidents are limited) and more likely after its conclusion. This delay poses a reelection challenge for the PRI, but, more important for investors, it also points to the ongoing challenge of maintaining popular support for the long process of implementing the reforms.

Political promises by the government included pledges that oil production will increase by nearly half a million barrels per day by 2018 (to 3 mbd) and another half million barrels per day by 2025; gas production is promised to nearly double by 2025; two million jobs are to be created by 2025; economic growth is to add 1 percent to GDP by 2018 and 2 percent by 2025; retail electricity prices will be lower; and public spending will increase, including for anti-poverty programs and education, through the government budget and the newly created Mexican Oil Fund.

Those are ambitious goals. Mexico will win signature bonuses from its early bid rounds, and PEMEX has a plan to quickly increase production, but deepwater production can take a decade or more to produce profits. The Mexican government estimates new investment of over $50 billion between now and 2018 from the first rounds of the opening. Industry experts more conservatively put oil production

growth expectations closer to 300,000 barrels per day (bpd) by 2018, and even that is dependent on Mexican officials successfully running auctions with attractive fiscal terms.

Unconventional oil and gas production will move slowly, as many of the unique conditions that facilitated the shale revolution in the United States are not present in Mexico. Meanwhile, retail gasoline and diesel prices will rise from currently subsidized levels. Progress on reducing electricity prices and generating surplus income for public spending derive from progress on oil and natural gas production and upgraded and expanded electricity infrastructure, which will take time and additional investment to bring to fruition.

Reform in the electricity sector is also likely to produce results slowly. Progress requires significant infrastructure investments in every part of the electricity system to achieve the reform's stated goals of improved system and cost efficiency. Recovering these costs will put additional pressure on the already subsidized retail electricity prices, even as the new legislation commits the government to remove generalized subsidies and provide focused ones for those truly on the margins. New and reformed institutions will take time to stand up fully. The construction of new natural gas pipelines with the lower-cost gas needed to replace higher-cost fuel oil and diesel will take time to build and permit. Regulations providing clarity and incentives for new private investment in generation will need to be established and evaluated before serious investment dollars are committed.

Maintaining public expectations and the political support to see the reforms through will be a substantial challenge.

Industrial consumers reliant on diesel may see prices fall, but, in the near term, further price relief at the retail level will almost certainly require subsidies beyond those currently in place. Electricity sales from new generation must cover the cost of the investment that has produced it.

Maintaining public expectations and the political support to see the reforms through, particularly as the next election nears, will be a substantial challenge. Now that energy reforms are passed, remaining cross-party cooperation is almost certain to end as the parties prepare to contest the 2015 midterm legislative elections. The steps taken by Hacienda, Mexico's Secretariat of Energy (SENER), Mexico's upstream oil and gas regulator (National Hydrocarbons Commission—CNH), and the new regulators to assure near-term positive results—including in matters pertaining to migrating PEMEX's contracts, auctions and new pipeline and power investments—will face intense scrutiny both in Mexico and abroad.

The Laws of Reform: Oil and Natural Gas

The Hydrocarbons Law, the Hydrocarbons Revenue Law, and the PEMEX Law[12] set forth the framework for oil and gas development in Mexico. These laws are the cornerstone of the energy reform. Indeed, increased production of oil and natural gas is key to the political legs of reform: increasing economic growth and job creation, improving Mexico's overall fiscal outlook, and decreasing electricity prices by substituting high-cost diesel and fuel oil with new supplies of natural gas.

The basic components of the hydrocarbon reform laws include:

- Conversion of PEMEX from a monopoly to a "state-owned productive enterprise" with special legal status, increased independence from the federal government and required internal reforms;
- Enactment of a Round Zero process wherein PEMEX first requested to keep some of its existing acreage, although SENER ultimately decided what it may keep (analysis of the outcome of the Round Zero process is below). In Round 1, PEMEX will begin migrating to new forms of contracts and may take on new commercial partners approved by CNH. Acreage that is either new or that PEMEX is not keeping out of Round Zero will be also auctioned in Round One and subsequent bid rounds;
- Authorization for state-owned productive enterprises (in this case, PEMEX) and private companies to participate in exploration and production through a series of four contract models based on international norms;
- Allowing individual contracts to contain customized terms, including requirements for national content in the procurement of goods and services for the sector;
- Near complete opening of mid- and downstream oil and gas to private investment; and
- Strengthening of independent self-funded regulators (CNH and CRE), with strict rules for transparent regulation of the sector, along with new agencies to manage the gas pipeline system.

The basic building blocks of those reforms had been outlined in the binding transitory articles of constitutional reform. However, the process of political negotiation did produce significant changes, including increasing domestic content requirements and establishing wide discretionary authority to set fiscal terms, among others.

PEMEX and Round Zero

A key aim of the reforms is to introduce new capital, technology, and competition into the energy sector by ending PEMEX's monopoly on hydrocarbons exploration and production. The reform also seeks to preserve a primary role for PEMEX in the sector, both to ensure government revenue flows reliably from its existing asset base for the short and medium term and to ensure that PEMEX itself emerges as a more capable, self-sustaining, and competitive entity.

The reforms provide that PEMEX will be converted to a state-owned productive enterprise (SPE)[13] and cannot be privatized. It can raise debt on public markets (at attractive rates with its sovereign backing) within limits set by Hacienda but cannot sell shares or equity instruments.

PEMEX will remain a revenue engine for the

government of Mexico. As a baseline, PEMEX is required to pay a duty (or dividend) at 70 percent in fiscal year 2015, with an expected decline to 65 percent by 2019.[14] PEMEX will also be required to pay additional duties on exports. However, the laws reward PEMEX for investing on its own (based on its *asignaciones*, the term for entitlements PEMEX won in Round Zero but did not migrate to new contracts) in the unconventional sector (e.g., Chicontopec) and deepwater plays with lower duties to encourage investment. But these duties will increase if particularly large production occurs or market prices rise.

PEMEX Restructured

Preservation of PEMEX's productive asset base was a major goal of reform and reflects the government's desire for PEMEX to remain a national champion that works alongside the private sector. It was granted its full request to keep its 1P (proven) reserves and 2P (proven and probable) reserves in Round Zero. These are equal to 83 percent of all 2P reserves within Mexico. PEMEX was also granted 21 percent of Mexico's prospective reserves, or 67 percent of what was requested. It will retain ownership (subject to regulation) of its midstream strategic assets and can dispose or restructure businesses or assets it deems unproductive in current form. PEMEX may migrate its existing production to new contract models to fix its fiscal commitments to the government on a predictable basis so it can plan to retain earnings and strategically invest in new areas.

The PRD leadership and others fear that PEMEX will weaken under the reforms. But PEMEX stands to emerge stronger and more independent.

As an SPE, PEMEX will have far greater management and budgetary autonomy while maintaining a mandate to maximize value for the state. The PEMEX law provides that it will have ten members of the board.[15] Five will be independent directors with staggered five-year terms, who are nominated by the president and confirmed through a special expedited process of no more than thirty days by a two-thirds vote of the Senate. They will truly serve as outside experts.[16] Those serving in these five slots can now include business people working in the private sector at the time of their service. That replaces the previous system where "independent" directors were required to be civil service employees. The five other directors will represent the government,[17] and the CEO will remain a presidential appointee.[18] Unlike with CFE,[19] labor unions will no longer be represented on the board.[20]

A reformed corporate board is critical to PEMEX's ability to act with independence in its strategic planning and investment decision-making, and to help ensure that PEMEX is no longer starved of the capital needed for reinvestment.

PEMEX plans to make major near-term improvements in its daily operations to save billions of pesos, while largely retraining workers made redundant. Immediate priorities include improving the procurement system, co-investing and farming out interests in its midstream assets to save capital, and lowering its dependence on the high expense of trucking product by constructing pipelines. Some of this is possible by establishing subsidiary companies.[21] PEMEX is Mexico's largest single consumer of electricity, but with co-investment in on-site power production it can cut costs and may even sell power into the grid from major midstream operations. By reducing costs, freeing up capital from fixed assets, and partnering with foreign companies to develop heritage assets and new infrastructure, PEMEX is poised for rapid growth.

PEMEX will be required to share its seismic information[22] and divest its gas distribution contracts. By January 2016, it will lose its monopoly on retail sales of gasoline and diesel and by January 2017 lose its monopoly on the import and export of crude oil, gasoline, and diesel. It will, however,

PEMEX plans to make major near-term improvements in its daily operations to save billions of pesos.

have an entitlement to insert itself (or "farm in") into specific types of projects. PEMEX's participation at no less than 20 percent will be mandatory for any resources that straddle an international border.[23]

PEMEX also has discretionary authority to farm into projects, such as in the case of geologically layered resource reserves where it already operates. More troubling for investors, the law also provides SENER with the authority to direct PEMEX to farm in to projects where SENER or PEMEX would like to acquire technology, expertise, or boost revenue for the new Mexican Oil Fund.[24] That broad discretionary authority raises risk in future, possibly less investor-friendly administrations. However, PEMEX must farm-in before the bid round begins, indicating that existing concession holders cannot be forced to forfeit project stakes to PEMEX after acquiring them through auction.

As a state entity, PEMEX may also be required to invest in certain projects throughout the value stream to meet a number of national interest goals as directed by SENER.[25] Financing from the federal budget will protect PEMEX's fiscal situation in instances where such ventures are not profitable.[26]

Round Zero

In an effort to preserve PEMEX's productive base, the constitutional reforms mandated a Round Zero (referring to a bid round) whereby PEMEX would maintain control over certain exploration and production areas, referred to as "entitlements." Round Zero commenced on March 21, 2014, independent of the secondary laws consideration, when PEMEX requested from SENER to keep 380 producing fields and 165 exploration areas.

As private companies will be required to do in subsequent bid rounds, PEMEX was obligated to demonstrate its financial and technical capabilities to successfully develop the fields. It is also subject to binding exploration and development plans.

SENER, with technical assistance from CNH, reviewed PEMEX's Round Zero requests. Although final determinations were not required to be complete until September 17, 2014, Mexico announced the results on August 13, 2014, as part of its accelerated implementation plan. Senior officials indicated early on that PEMEX would not be awarded all of its requested acreage, particularly in deep offshore and unconventional fields. In the end PEMEX was awarded 83 percent of Mexico's probable (2P) reserves and 21 percent of Mexico's prospective (3P) reserves, although it had asked for a 31 percent share. Those areas requested by but not awarded to PEMEX will be included in subsequent bid rounds for private companies.

PEMEX will be allowed to bring private partners into those exploration and production areas it is awarded in Round Zero. PEMEX will likely convert twenty-four existing service contracts (many of which it entered with the private sector pursuant to the 2008 reforms) into profit sharing arrangements, for which new bidding is not required.[27] This move may boost production by up to 250,000 barrels a day within eighteen months.

In other exploration and production areas it retains through Round Zero, PEMEX is expected to seek external partners and migrate to new contracts for about 30 percent of fields. As a first step, PEMEX will migrate fourteen blocks in ten projects by the end of 2015. While there are many variables,

optimistically an additional 300,000 barrels per day of production could be reached within two years.

The contract migration process, however, relies on new regulatory processes. After PEMEX notifies SENER that it wishes to partner, a bid round will be held to find a partner. Mirroring the tender guidelines for subsequent bid rounds, SENER and Hacienda will set the terms of contracts for bid and CNH will administer the process.

Although PEMEX may not directly set its own partners, it does have the ability to shape the outcome. CNH is required to have PEMEX's approval on the technical, financial, and experiential requirements of each tender up for migration.[28] Moreover, CNH is required to ask for PEMEX's views during pre-qualification of companies. However, PEMEX is ultimately subject to the outcome of the bid rounds and therefore will not be allowed to choose its own partners. These provisions are meant to ensure transparency in the contract migration process to address concerns about corruption and backroom dealing. PEMEX will maintain a soft veto over the company chosen through bidding. Although PEMEX is free to share its opinion of the chosen company, it will not have the authority to force the re-opening of the bid.

PEMEX's Future

PEMEX enters this new period of transition with huge assets and some significant liabilities. It is a major producer, at 2.9 million barrels per day of total oil liquids, 2.5 million of which is crude, with the remainder comprising lease condensate, natural gas liquids, and refinery processing gain.[29] These figures render PEMEX one of the largest oil companies in the world, as its production is comparable to that of Chevron, and it has unmatched experience on the ground in Mexico. [30]

New entrants wanting to hedge their political bets, in the event the next administration is less friendly to foreign capital, are likely to want to partner with PEMEX to ease public acceptance. Partnership with PEMEX on its existing fields, either for enhanced oil recovery or in deepwater, will provide companies with an invaluable and likely profitable first mover advantage.

PEMEX is saddled, however, with the short-term burden of remaining the largest single source of revenue for the government. The company also faces a potential loss of human capital to foreign companies, the need to raise capital and compete for new acreage on an equal footing, and the burden of being subject to more severe penalties for wrongdoing than foreign entrants.[31]

Usually "leveling the playing field" in the context of these reforms refers to allowing international companies to compete against PEMEX, but the concern also runs in reverse. A key challenge for the Mexican government, Hacienda in particular, is to ensure that PEMEX does not face an undue burden in setting priorities and investing that would compromise its ability to compete. The legislative reforms did produce some innovation in this regard. PEMEX's budget remains part of the federal budget. PEMEX submits its proposed budget to Hacienda, and then Hacienda sends its modified proposal to Congress for approval. However, legislative reforms now require that the Hacienda budget carry with it the original PEMEX proposal.[32] Such transparency should help bolster PEMEX independence. Congress will set a topline budget number for PEMEX, but PEMEX will retain flexibility to shift spending for particular outlays as long as they adhere with this budget number.[33]

Further financial relief for PEMEX came late in the negotiation process. If PEMEX is able to successfully renegotiate contracts with its union, then the federal government will take over the existing pension debt amount equivalent to the savings negotiated. Per the terms of this renegotiation, one condition for the government to take over pension liabilities is the transfer of union workers to

the existing national pension scheme rather than the union workers maintaining an independent system.[34]

PEMEX is certain to be the preeminent player in the Mexican upstream for the next decade and possibly beyond. The results of the first bid rounds and the success of deepwater exploration will determine if there will be other major players. Whether PEMEX grows as a Mexican oil major, or evolves like Norway's Statoil into an international oil major in future years, is uncertain, but much will depend on how truly free it is to invest in expertise and productive assets, while maximizing government value. For the next decade, simply making PEMEX an efficient, modern, and capable deepwater and unconventional operator would be a huge accomplishment.

Competitive Exploration and Production: An Administrative Framework

The secondary laws reflect the constitutional mandate's intent that hydrocarbons in the subsoil remain the property of the Mexican state but also maximize their national benefits by contracting with national champions and private companies. After Round Zero, PEMEX and international oil companies will compete, and be regulated, on equal terms.

Round Zero was released ahead of expectations, and Round One itself is expected to take place in the first half of 2015. Companies have been invited to comment to the government on Round One acreage through November 2014, with preliminary terms to be released beginning in November 2014. Contracts will be awarded on a rolling basis between May 2015 and November 2015. In total, 169 blocks are expected to be awarded; sixty will comprise production while the rest will be for exploration.[35]

Through the Round Zero process, PEMEX was granted rights to all of the "proved" and "probable" reserves for which it sought access.[36] Thus, PEMEX will retain access to 83 percent of all "P2" (proved and probable reserves), and has committed to invest $50 billion in development between 2015 and 2018. PEMEX will seek partners in ten projects on fourteen blocks it retained through Round Zero, which include ventures in the Perdido offshore deepwater area, extra-heavy oil fields, and mature fields. PEMEX says these ventures will require investments totaling around $32.3 billion over the next five to ten years.

Overall reactions to the Round Zero results have been positive. Analysts note that important prospective reserves remain available for private-sector investment, as PEMEX was awarded only 21 percent of prospective reserves through Round Zero after requesting 31 percent. Yet at the same time, PEMEX was granted the rights to continue operating at all fields where it currently has commercial production, allowing it to retain its current crude oil production platform of 2.5 million bpd.[37]

The speed and efficacy of exploration and production gains will significantly depend upon the prequalification procedures and evaluation criteria that the government uses for bid rounds. To maximize transparency, the government wants to make auction decisions based on the highest bidder, with weight assigned to the government's share of income.

But weight must also be given to how fast a bidder commits to start work (how many wells and how soon), the terms of which are codified into what the oil and gas industry terms "work programs," as well as the bidder's record of experience in relevant categories of exploration and its safety record. These are collectively known as "prequalification" criteria. After some debate, an "investment variable" that will give these elements some weight determined on a case-by-case basis (as work programs are quantifiable) was also included. It

is worth noting that signing bonuses will *not* be considered part of the investment variable, as signing bonuses will instead be fixed within the terms of each contract. The "payment variable" (government take) will remain the most important determining factor. CNH will need to be careful to pick operators with an eye to mitigating the risk of environmental or safety incidents that could erode public confidence.

The administrative supervision of upstream licensing is divided among SENER, Hacienda, and CNH, with flexibility and discretion given to each agency. Additionally, a National Agency for Industrial Safety and Environmental Protection is charged to work alongside CNH in ongoing regulation of the sector [SEE FIGURE 1, P. 15]. This system conforms to the best international practices of separating the functions of policymaking, licensing, and operational supervision. It also amplifies the challenge of building administrative capacity since each organization is independent of the next. CNH has long been a weak subsidiary of SENER. Giving it budgetary as well as administrative independence is a major step forward.

For the oil and gas reforms to be economically (and politically) successful, Round One must be well-subscribed, activity must begin swiftly, and PEMEX must increase production on its existing inventory, alone or with new partners. Each of these elements depends on the ultimate attractiveness of the terms offered and the speed at which the government implements the reforms.

Key Agencies of Administrative Supervision

SENER plays the lead role in upstream policy formation, most importantly in three respects: determining specific areas to be made available and the schedule by which they will be released; contracting (choosing which of the four contract models to apply to each auctioned area, the non-fiscal terms of the contract, and development plans); and recovering abandoned areas. (Hydrocarbons Law Article 29)

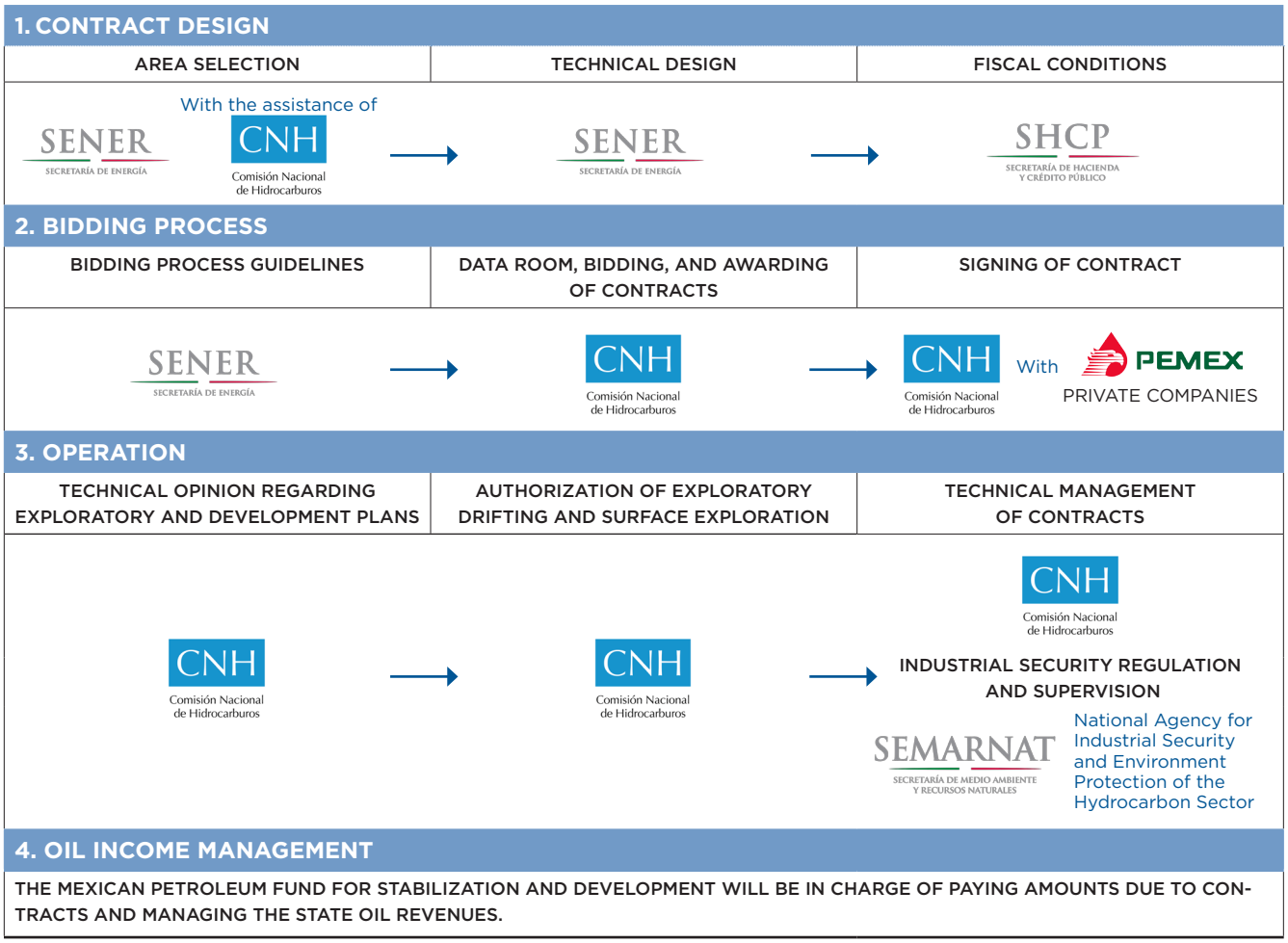
Hacienda will determine the fiscal terms to apply to each contract (including through use of an adjustment factor, for example an "R" factor—roughly the allowed ratio of cumulative costs to cumulative returns), and have audit functions. (Hydrocarbons Law Article 30)

CNH will be the primary interface on an ongoing basis for private companies entering Mexico and for PEMEX, and will be responsible for executing and managing exploration and production contracts. CNH is required to work with SENER to provide technical assistance throughout SENER's planning and approval processes, but it is CNH that will formally open tenders on new areas. CNH is also charged with ongoing oversight of all contractors to ensure their compliance with terms of contracts, including their exploration and development plans. (Hydrocarbons Law Article 31)

Crucially in a country where PEMEX has a monopoly in on-the-ground (and under-the-ground) experience, CNH also is charged to hold and manage seismic and other data, in collaboration with a new National Hydrocarbon Center. (Hydrocarbons Law Chapter III) Finally, CNH also has the authority to revoke contracts, as specified in Article 20 of Hydrocarbons Law, which mirrors the clear yet still not exhaustive language allowing for the revocation of entitlements as detailed in Article 10. However, unlike for entitlements, which CNH can simply revoke, disputes over other acreage are subject to international arbitration, according to Mexican law. (Arbitration clause is Hydrocarbons Law Article 21)

The National Agency for Industrial Safety and Environmental Protection, part of the Secretariat of Environment and Natural Resources, is charged to regulate safety and environmental concerns across the energy sector (Hydrocarbons Law Article 129). President Peña Nieto has announced that such regulations will be released by mid-November 2014.

FIGURE 1. Contract Procedure



Source: SENER

To launch a Round One tender by mid-2015 and migrate PEMEX to new contracts and partners, Hacienda, SENER, and CNH will have to act with extraordinary speed and competence. Hacienda will need to assign terms that reflect the competitiveness of the global market, and how hard, for example, it will be to attract investment in shale gas fields that are far from infrastructure or in insecure areas. SENER will need to make rapid decisions on the forms of contracts to which PEMEX can migrate. Additionally, by the end of 2014, CNH—currently with a staff of little more than eighty people—must organize all of PEMEX's seismic inventory, procure new information on new areas, run auctions for PEMEX's new partners, organize new Round One auctions, and establish rules and procedures for audit and inspection.

They will all need outside help to bolster internal capacities, and the budgetary allocations for these agencies—especially CNH—will be a bellwether of their ability to execute. Although these agencies have been preparing for this calendar for months, they are already behind from a procurement and capacity perspective.

Forms of Contract

Companies awarded exploration and development rights will operate under one of four contract types, and each contract will be assigned to an individually legally incorporated entity under the control of individual or partnering companies. By allowing a variety of contract

FIGURE 2. The Four Forms of Contract

THE GOVERNMENT CAN SELECT FROM A WIDE ARRAY OF CONTRACTUAL ARRANGEMENTS

CONTRACTUAL ARRANGEMENTS			
Service Contracts	**Profit-Sharing Contracts**	**Production-Sharing Contracts**	**License Contracts**
Companies are simply paid cash for their work, often in the form of a per-barrel incentive.	Private companies are paid in cash a percentage of the net profits from developments, with the state receiving the remainder.	Companies are paid in production (oil and gas) a percentage of the net profits from development, with the balance going to the government	Private companies contract with the government and receive product as payment, but pay the government in cash (through taxes and royalties).

Source: Hydrocarbons Income Law, Articles 6-22.

types, the secondary legislation increases the ability of the Mexican government to customize terms according to a diverse resource base [SEE FIGURE 2]:

- **Service contracts**, in which partner companies are paid set fees, like those previously available under Mexican law, are not appealing to international oil majors since they deliver lower returns on capital, and offer no reserve booking option. They can be appropriate for types of work where risk is low and service providers other than international oil companies (IOCs) can perform the required work.
- **Profit-sharing contracts** are most appealing to service companies, which may not be interested in the risk of payment in a commodity.
- **Production-sharing contracts** are typical for frontier energy provinces, and those areas with significant geologic risk like deepwater exploration.[38] Nigeria, Angola, and Azerbaijan all have production-sharing models.
- **License contracts** where private companies receive product as payment, but pay the government in cash (through taxes and royalties) rather than in oil are typical in the Middle East, where there is little geologic uncertainty, and in countries where the government is interested in revenue rather than payment in oil. Libya has some concession agreements, and the United States receives tax and royalty payments for its Gulf of Mexico acreage.

SENER, with technical support from CNH and the non-binding opinion of Hacienda, is charged with determining the type of contract to apply to each development. Hacienda will determine the fiscal terms of each contract and bidding variables. As noted above, CNH is then responsible for administration of the bid rounds and the contract oversight. Industry is eager to see the model contracts to be offered in each category, and the exact terms (including the applicable local content requirement) are a source of some uncertainty that should be clarified within the next six to twelve months.

Fiscal Terms

The fiscal terms applicable to each form of contract, as well as entitlements issued to PEMEX through Round Zero, are established under the Hydrocarbon Revenues Law.[39] These terms include the payments owing to the government and the costs that may be deducted from these payments. Fiscal terms determine the explorationist's return on investment, and are the dominant factor in assessing the attractiveness or international competitiveness of a country's framework.

It is important for countries and companies to have a good risk and reward balance. For contracts to be stable, countries need to participate in the economic rent that comes with high oil prices. For companies to sustain investment, they must earn returns on capital that consider the risks of costly dry wells, high costs of exploration for marginal wells,[40] or early unconventional development.

Mexico has devised a system with the flexibility to address these variable concerns by having royalties that vary with the price of oil, and by allowing Hacienda to assess an "adjustment mechanism"[41] which could be low to incentivize investment in high risk areas, or higher to adjust for very high yield fields or those with very low geologic risk. This flexibility can either be an asset allowing great agility for the Ministry to adapt to changes in the oil market, or a liability if future Ministry leadership overreaches.

Figure 3 [P. 18] shows the taxes and fees that apply to each form of contract. Mexico's law provides for some common and some unique fiscal terms for each form of contract, with great discretion for the Ministry of Finance to assess an adjustment factor to make a particular contract attractive or costly. The categories of taxes and fees are typical for the industry, and Mexico's tax and royalty rates are competitive, with the flexibility to provide greater or lesser incentive as oil prices vary (or as Hacienda's discretion advises).

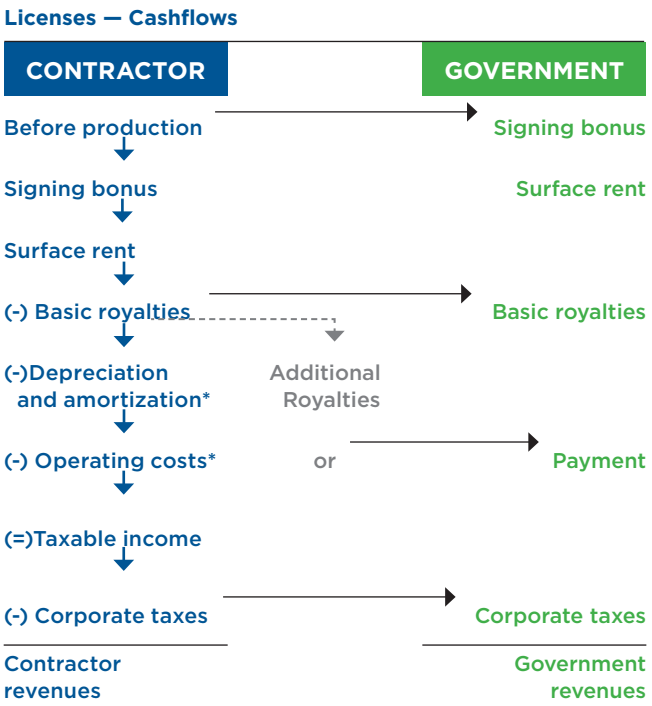
All companies pay the general corporate tax rate.[42] Other payments reflected in figure 3 are also typical. The "adjustment mechanism" can be assessed against either gross or net revenues and will allow the state to capture a large portion of upside gains. Contractors will have to pay *surface rent* on a monthly basis for holding the acreage so there is a payment to the government before activity begins. This rent will shift from $1,150 pesos to $2,750 pesos (or approximately $90 to $210) per square kilometer after the first five years of the contract period and have yearly adjustments for inflation. These rent payments cannot be included by companies in their cost recovery accounting, but they will be deductible for corporate income tax purposes. The surface rent is intended to serve as an incentive for the investor to begin production, and it will no longer have to be paid once production begins.

The final version of the Hydrocarbons Income Law also introduced new exploration and extraction taxes, as detailed in Article 55 of the law. These taxes, which the investor will pay during the exploration and extraction phases, respectively, are intended to shift some of the rent directly to Mexican states and municipalities. Although the investor will have to pay the surface rent tax and the exploration phase taxes concurrently, the surface rent tax was decreased in the final version of the law. The difference was transferred to comprise the exploration tax, so there is no material difference in the amount of tax the investor will pay.

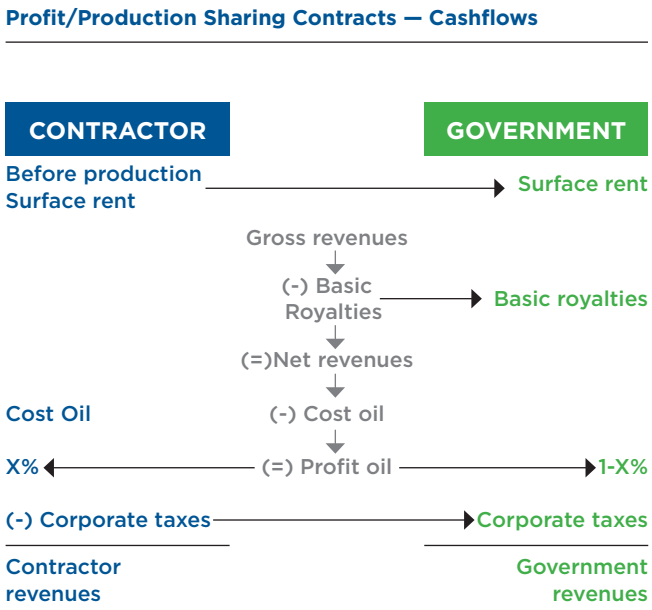
Royalties will be assessed on actual production and are required to be indexed to market prices. Some legislators initially sought royalty rates as high as 35 percent, but the royalty rates agreed to be far lower [SEE FIGURE 4, P. 19]. For crude oil, the rate is set at 7.5 percent when the per barrel cost is below $48/bbl, while the royalty rate for condensate is set at 5 percent when the per barrel cost is below $60/bbl.[43] The royalty rates for both crude and condensate will increase at higher per barrel prices pursuant to rate formulas prescribed in the Hydrocarbons Income Law.[44] For associated gas, a linear upward trajectory for royalty rate and gas price will apply, whereas, recognizing the dire need to boost gas production in the country, non-associated gas will enjoy no royalties when natural gas prices are below $5/mBtu (million British thermal units) and will be on a sliding scale thereafter. Mexico has adopted an excellent best practice in utilizing international benchmark prices (tied to the quality of each product stream) to set royalties rather than an "official" (usually below benchmark) selling price of the government.

All payments except taxes will be directly sent to the Mexican Oil Fund, which will be responsible for disbursing funds per a formula established in the transitory articles of the constitutional amendment.[45] The Mexican Oil Fund will also be

FIGURE 3. A New Contract Tax Structure



Source: Secretaría de Hacienda y Crédito Público.



Source: Secretaría de Hacienda y Crédito Público.

responsible for calculating payments to contractors, which Hacienda can verify. Financial flows will be made public.

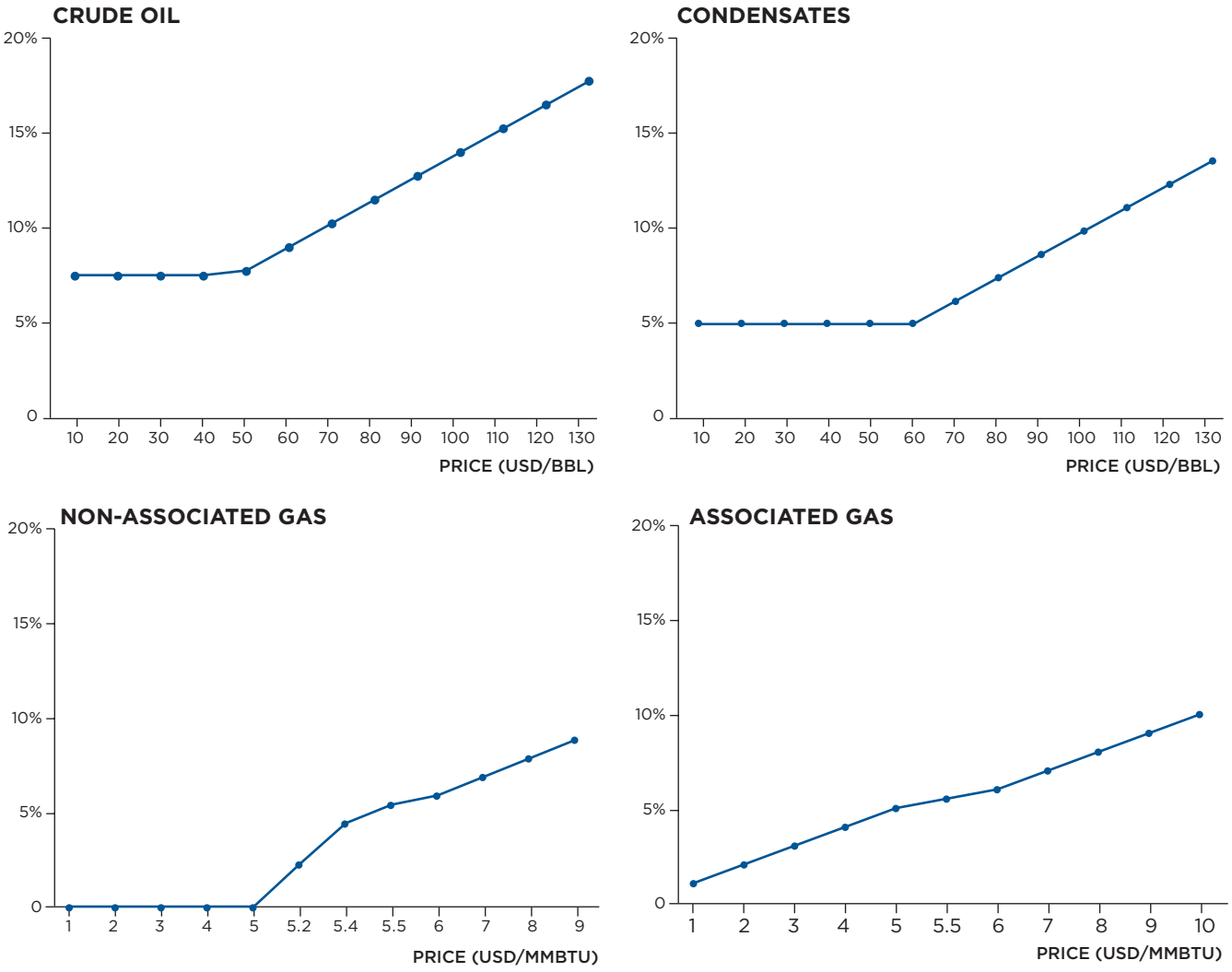
In the process of negotiating secondary laws, two significant tax provisions that could have significantly harmed investment were largely resolved for deepwater developments. The final law eliminated "ring fencing" within the scope of upstream exploration and production activities, allowing costs incurred in development to be deducted against profits in another.[46] However, mid- and downstream projects will remain ring-fenced. In other words, companies will not be permitted to deduct costs incurred in mid- and downstream projects against profits in either other mid- or downstream projects or upstream project profits.

The final secondary laws also adjusted the ten-year carry-forward restriction that applies to most investments to allow for losses to be carried forward for fifteen years for deepwater (over 500 meter) projects. These changes, along with the inclusion of some weight for quantifiable work plans, show the willingness of Mexican leaders to adapt to investor need, and will substantially improve the prospects of a successful deepwater bid round.

The Hydrocarbons Law contains many provisions that could cause unanticipated costs, delays or deterrents, although none are expected to be serious handicaps to investment in the sector.

One is the requirement for *Social Impact Assessments*.[47] The law requires that SENER conduct a social impact study before any area can be put out to tender, and that companies awarded tenders do the same with negative impact mitigation proposals. Moreover, SENER has the authority to require companies awarded blocks to engage in local spending programs. Subsequent regulations should set the scope of that authority. Less concerning but still costly is the requirement that any employee in Mexico for thirty days or more be taxed as a Mexican resident (which is standard

FIGURE 4. Royalty Rates



for the economy), adding cost and administrative complexity to operations.[48]

Another potential deterrent is the apparent provision for unlimited liability for gross negligence in industrial accidents.[49] Mexican experts note that these concepts are recognized in the Mexican Civil Code and will be interpreted in the Hydrocarbons Law as such, and explain those provisions may appear harsh in comparison to their US counterparts because US government-imposed liability exists alongside civil liabilities. Mexican officials assert that the country has only a limited civil liability regime, while legal experts note that it is very difficult to prove gross negligence under Mexican law. The contracts will also provide more precise definitions of what constitutes gross negligence. Yet the risk is that only the largest companies, with the ability to self-insure, would take the risk of investing in Mexico's deepwater.

Until investors know what fiscal terms, what cost deductions, and which form of contract will apply to each field, they cannot calculate the return on their investment. While some experts privately estimate that the government's share of income will range from 50 to 75 percent, this will remain unknown until the government announces the Round One tender and provides the forms of contracts for each field.

Hacienda has, so far, reserved the right to assign fiscal terms to each individual contract, rather

than to an entire class of assets—say all deepwater contracts or all shale gas contracts. However, outside observers expect Hacienda to leverage this authority judiciously and apply similar terms across each asset class except when unique circumstances warrant adjusted terms.

The enormous discretion inherent in this arrangement has the potential to impose an undue administrative burden on Hacienda. As the reforms are implemented, if Hacienda finds that it must set variable terms on the same contract types on a frequent basis, it will need to ensure it has requisite financing and staff with relevant expertise to set these terms in a timely fashion. Hacienda is establishing a new unit for contract implementation with nearly eighty people—an excellent sign. Hacienda's discretion is a two-edged sword for investors. While a pro-international investment environment at Hacienda will be strengthened with legal flexibility, it also makes it hard for potential investors to predict what terms and returns will apply to Mexico's oil sector in the near term and raises future risk if Hacienda has less investor-friendly leadership in the future.

Overall, however, the secondary laws reflect a profound understanding that fiscal terms should reflect markets. Other than the adjustment mechanism, the terms are endogenous and set by bidders. As reflected in treatment of PEMEX, investments in riskier areas (unconventionals and deepwater) offer greater returns, ongoing production in marginal fields is rewarded, market benchmarking and CPI-indexing are used, and the government take is variable based on market conditions.

The hydrocarbons law provides a target of 25 percent local content in the sector by 2015 and 35 percent by 2025.

Local Content

The constitutional amendments' transitory articles mandated establishment of rules to maximize local content in the procurement of goods and services by operators. SENER and the Ministry of Economy are tasked with the authority of ensuring the enforcement of national content targets for each contract.

That provision prompted significant concern by private industry that Mexico might follow the course of Brazil, where onerous requirements, sometimes in the range of 55 percent,[50] have driven up production costs and deterred investment.

However, Mexico's secondary laws include a flexible national content regime, and the targets are reasonable.

The hydrocarbons law provides a national target of 25 percent local content in the sector by 2015 and 35 percent by 2025.[51] Local content requirements were among the most hotly debated in negotiations over the secondary laws as Congress raised the baseline goal from 25 percent during the course of the debate. It applies to oil and gas, except that deep and ultra-deepwater projects will have separately tailored targets determined by SENER and the Ministry of Economy.

Specific, binding targets for all upstream projects will still be determined on a contract-by-contract basis to reflect Mexico's input capacity. The 35 percent target is an aggregate target, and Hacienda will determine a percentage and ramp-up schedule on a contract-by-contract basis, considering international treaty obligations and the ability of local providers to fulfill the project requirements.

This is a flexible but administratively complex

methodology. Hacienda and SENER have recognized that Mexico may lack the capacity to provide national content in certain areas, like deep offshore technology and for certain classes of expertise or equipment.

Therefore the target in deepwater could be as low as 1-2 percent in initial years, rising to 5 percent by 2025.

The Hydrocarbons Law also sets forth certain criteria that must be applied in setting a target, including the origin of goods and services, the availability of local labor, local, and regional infrastructure investment, and technology transfer. Although the precise nature of this methodology will remain uncertain until the regulations further detailing how it should be applied are promulgated, it affords Mexico the opportunity to measure local content on the basis of aggregate economic activity of the project, rather than more intrusive mandates on particular components of the value chain. But there is no cap on this content and requirements in other areas could be well north of 35 percent in early years.

Given the public scrutiny on local content provisions, the law requires that Hacienda set up an independently funded office to promote growth of Mexican suppliers, register Mexican supply companies and enforce compliance.[52] Violations for non-compliance could be severe.[53]

Capable Mexican companies (requiring, simply, incorporation in Mexico to qualify as "Mexican") will enjoy an additional competitive advantage by being given explicit preferential treatment under the law.

Moreover, the secondary laws call for Hacienda to create and subsidize a funding facility, called a Public Trust to Promote Development of National Suppliers and Contractors of the Energy Industry, to be established in September 2014. This Trust will promote domestic energy companies through training, certification, and financial backing.[54]

Mid- and Downstream

Constitutional reform paved the path for near complete opening of the mid- and downstream segments of the energy sector in Mexico. Refining, marketing to consumers, transportation, processing, and storage are no longer "strategic" under Mexican law, so PEMEX, CFE, or other state-productive enterprises will be allowed to freely co-invest in those areas and international companies will be allowed to directly invest.[55]

PEMEX will continue to lead this aspect of the energy sector, given its legacy assets. All of Mexico's refineries and liquids pipeline infrastructure is under PEMEX control. Likewise, it dominates natural gas infrastructure. Recognizing a high barrier to entry for new companies, the secondary legislation contains numerous regulatory provisions to encourage competition, keep PEMEX in check, and transition to market pricing schemes attractive to investors. CRE holds broad authority to regulate PEMEX pricing in oil, products, and natural gas until a competitive market develops to ensure that PEMEX is not unduly taking advantage of its dominant market position.[56] PEMEX will likely transfer some assets to new subsidiaries and bring in outside investors for some assets.

SENER and CRE will play a vital role to ensure market access for new entrants and manage the transition as PEMEX relinquishes its mandate to provide for the entire nation.[57] SENER will manage permits for refining petroleum, natural gas processing, import and export,[58] and will monitor those activities.[59] CRE has permit jurisdiction over transportation, storage, distribution, compression, liquefaction, decompression, regasification, marketing and sale of crude oil, oil products, and natural gas,[60] as well as ongoing monitoring.[61]

A central aspect of CRE's authority is enforcement of open access of all oil, product and natural gas pipelines and storage, which will be in force within a year.[62] Without that, new exploration and

Both PEMEX and private entrants in the mid- and downstream oil sector are expected to build export capacity to Pacific markets.

production entrants could struggle to move product. However, this remains an area of possible concern. Although PEMEX and CFE will be required to make excess pipeline capacity available for other companies on a user-fee basis, they each have first call on that capacity for their own product, giving it a substantial advantage.[63] For natural gas, this concern may be mediated somewhat by the newly formed CENAGAS operator but no such intermediary exists for oil. It is expected, however, that PEMEX will spin-off its pipeline business into a subsidiary, or less likely an affiliate, due to general prohibitions in the secondary laws on owners of transport infrastructure also marketing the product under transit.[64]

The Hydrocarbon Law requires that CRE manage "integrated systems" of pipeline and storage for oil, petroleum products, and natural gas.[65] This system approach should help promote national infrastructure development, ensure security of supply, and foster competition where PEMEX, and to a lesser extent CFE, will enter with a tremendous advantage. Assets of state-owned productive enterprises must be integrated into the system, however, privately held pipelines and storage facilities can join only voluntarily. CRE leads regulation of the integrated system and in the process of issuing permits may require physical modifications and interconnections.[66] Recognizing the difficulty in instituting a full national system, the law allows for regional authorities, or managers to regulate integrated systems. Overall authority remains with CRE.[67]

The secondary legislation phases in retail competition and market pricing for gasoline and diesel, and it phases out PEMEX's monopoly on retail sales and product imports. Negotiations over the secondary law achieved a more rapid liberalization than previously contemplated. As of 2016, any existing service station may begin retailing motor fuels without franchise from PEMEX.[68] Furthermore, existing retail stations are free from their supply contracts with PEMEX as of 2017, and PEMEX may not limit its sales of gasoline and diesel to only franchised stations. Some expect this process to be gradual, as CRE will still have to issue permits for the sale of gasoline and diesel to the public. More details will be released with the promulgation of regulations. As of 2017, PEMEX will cease its monopoly on product imports. But unless PEMEX divests product pipelines or new pipelines are built, its remaining dominant position in distribution may pose an obstacle for new entrants in retail.

The legislation also quickly decontrols motor fuel prices. Beginning in 2015, Hacienda will raise prices on a monthly basis per established regulations determining the maximum price, and both gasoline and diesel prices will be completely decontrolled by 2018.[69] Removal of motor fuel pricing control has proven controversial in many countries, but it was necessary to encourage increased domestic refining capacity.

Looking ahead, both PEMEX and private entrants in the mid- and downstream oil sector are expected to build export capacity to Pacific markets. With US supply of light tight oil surging, there is little room for exports to the US market. Mexico may start importing light crudes from the United States as its refinery base expands. Mexico's dominant crude production is in heavier oils. It will compete principally with Canada for that market.

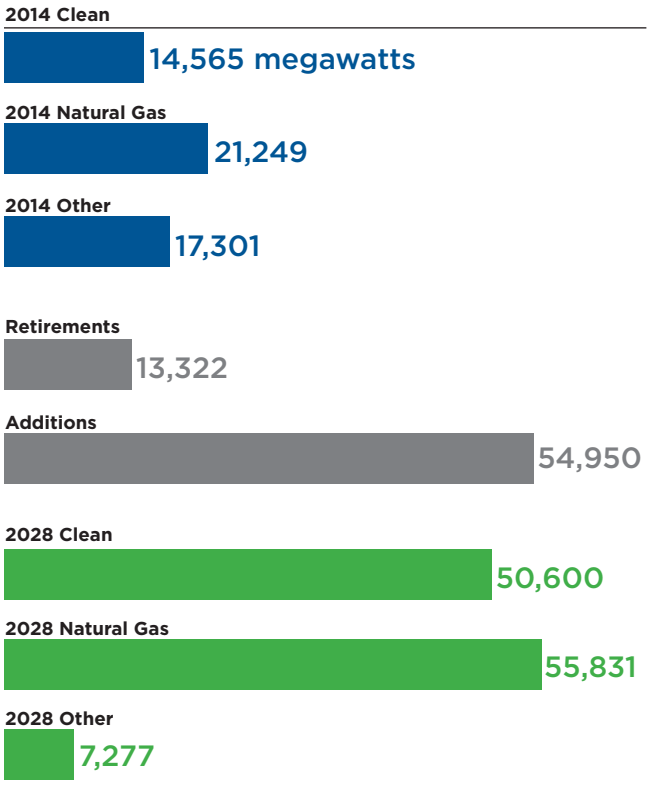
Natural Gas: Production to Power

Increased access to natural gas is the hidden political lynchpin of the energy reform. Mexico, a nation with likely the sixth-largest technically recoverable shale gas resources in the world,[70] also has high electricity prices and recently had gas shortages in some parts of the country. Its pipeline infrastructure is woefully insufficient to build an internal market and meet demand.

The reform aims to accelerate the growth of the entire economy, not just grow oil and gas production. Broad-based growth relies on attracting new investment, which depends on large consumers enjoying reliable low cost power. These low costs depend on increased access to affordable natural gas, which, in turn relies upon access to US gas and, further down the line, increased domestic production. As a result, the natural gas industry will be undergoing a tremendous—and badly needed—restructuring.

Mexico now has an ambitious plan to double its installed generation capacity by 2028, to 110,000 MW, largely fueled by the addition of over 50,000 MW of natural gas-fired capacity[71] [SEE FIGURE 5]. CFE has plans to build a network of midstream natural gas pipelines to transport natural gas from the United States, domestic gas from Mexico's prospective shale fields, and imported liquefied natural gas to satisfy projected demand of 7.7 bcfd (billion cubic feet per day) by 2028 for CFE alone.[72] CFE is currently in the process of tendering $2.2 billion of natural gas pipelines to enter commercial operation in 2016-2017,[73] together with over 1,600 MW of new gas-fired capacity to be fueled by them. CFE also recently announced plans to convert seven plants totalling 4,600 MW from oil to gas at a cost of $300 million over 2014–2016. The energy reform is intended to provide incentives for additional midstream gas investment by CFE and PEMEX, who together control over 90 percent of Mexico's gas pipeline capacity, and private sector actors.

FIGURE 5. CFE Projected System Growth: Installed Capacity (in MW)



Source: CFE

Natural Gas Strategy

The natural gas strategy is to liberalize the production, transportation, and sale of natural gas to make for a more internally and

internationally competitive sector with an ultimate goal of lowering power costs. The secondary laws open each stage of the value chain, with the exception of some retail power sales discussed in the next section.

Gas exploration and production will benefit from reforms opening the upstream sector. It is expected, however, that as a part of contract terms, new gas production may not have to be linked to the Henry Hub price. This crucial step will help incentivize geographical dispersion of development, but in the near term the strategy relies on imports of US natural gas. This can be a significant advantage because the Henry Hub priced gas is cheap compared to liquefied natural gas imports and can be delivered quickly if US and Mexican regulators permit new lines swiftly. New gas pipelines[74] are being built from the United States to Mexico. These will serve as relief valves for Mexican industry while the nascent unconventional and deepwater gas efforts increase.

A primary aim of the secondary laws is to foster a competitive gas market. To achieve that end, the laws limit vertical integration of natural gas companies and install CRE oversight of all retail gas marketing. Mexico wants to ensure competitive pricing for natural gas, and one way to accomplish that goal is to ensure that the companies cannot dominate both transportation and distribution.

This healthy caution may also prevent PEMEX or even CFE from exerting monopoly position. A pillar of this effort is a new independent National Natural Gas Control Center (CENAGAS).[75] CENAGAS will be responsible for managing the national integrated system of gas transportation and storage and for planning its expansion, subject to the approval of SENER with advice from CRE, which also regulates the system. The stated intent is to avoid market domination by regulating open access to gas pipelines, requiring the marketing of any unused capacity, and imposing consistent transportation tariffs, with the expectation of providing transparency over gas allocation.

Insufficient gas infrastructure has been a lingering source of concern in Mexico. For that reason, CENAGAS has a mandate to produce five-year plans for infrastructure development, in conjunction with planning for transmission and gas storage.[76] Those plans will contain both "strategic," including major pipelines, redundancies, some storage, and corridors to particular markets, and nonstrategic infrastructure to be built. CENAGAS, under CRE supervision, will directly tender strategic projects and state-owned productive enterprises (presumably first of all PEMEX) will be able to participate, although not exclusive of private partners.

CENAGAS will be established by executive order within twelve months,[77] but Peña Nieto is wasting no time in indicating a decree for its creation that will be promulgated in August 2014. That decree will also require immediate transfer of PEMEX's gas transportation contracts to CENAGAS. At the same time, per the terms of the broader energy reform, CFE is evolving from a power company into an energy company with rights to commercialize natural gas. Some fear the risk of creating another monopoly over gas supply in the electricity sector. CFE and PEMEX are required to transfer ownership and management of Mexico's pipeline infrastructure to CENAGAS, which will act as the independent systems operator (ISO), CENAGAS *will not* have the authority to make available pipeline capacity that is already in use. It will, however, have the authority to make excess, non-contracted pipeline capacity available. More ample pipeline capacity will thus be available to private investors as more privately owned pipelines are built.

CRE will enforce open access provisions for both state-owned and private infrastructure to enable a competitive marketplace.[78] Gas marketing by transport companies is prohibited except in select operative emergency situations,[79] and electricity

generators will not be able to hold equity interests (directly or indirectly) in operators of gas transportation or storage in the same geographical area as their generation. While CENAGAS will control pipelines, PEMEX (or other producers) will retain first call on their pipelines to transport gas they produce, and CFE will continue to enjoy exclusive rights to the capacity it has contracted. With limited capacity on the existing trunk pipelines bringing gas from the United States, PEMEX and CFE will retain control of natural gas access for some time. Until new pipelines with excess available spare capacity are constructed, there will be legitimate concerns over the ability of the private sector to access natural gas on equal footing for new generation projects.

To foster a competitive market, the laws limit vertical integration of natural gas companies and install CRE oversight of all retail gas marketing.

An Unconventional Gas Future?

There are significant challenges to the framework where domestic shale gas development is concerned, including lack of infrastructure in northern Mexico, higher cost of providing oil field services in Mexico (versus the service hub in Texas), high risk and cost of providing security, and high transaction cost of accessing land rights from the ejido (communal land) owners.[80] The challenge of attracting investment in unconventional acreage far from services and infrastructure and with uncertain permitting rules is not unique to Mexico. Colombia, for example, recently received only one bid for its unconventional acreage in its 2014 bid round, while interest in on and offshore acreage was high.[81]

Mexico will need to address security issues both for unconventional and pipeline investment. Much of Mexico's best prospects for shale gas are interspersed in violent regions with a large presence of criminal networks.[82] Oil companies have experience working in difficult and dangerous environments, sometimes providing for their own security but more often relying on the host government for protection. For some smaller companies with no such experience, financial incentives may not be enough to overcome hesitancy of workers or corporate boards to enter what they perceive as a dangerous country.

The Mexican government will need to communicate its strategy for addressing security in all areas of investment, although the issue onshore is acute.

Land access issues present another serious concern, and the secondary laws contemplate a complex process of engagement with local communities. Mexico's land tenure system, where land can be owned collectively through the ejido system, makes it difficult to identify who the authorized owner of the land is and who can agree to terms and enforce them.

In addition, Mexico does not enjoy the private mineral rights ownership that has encouraged shale development in the United States. Article 101 of the Hydrocarbons Law attempts to address this issue by allowing (but not requiring) investing companies to pay between 0.5 percent and 3.0 percent for non-associated gas and 0.5 percent and 2.0 percent[83] for other gas after-tax revenues as an incentive for surface access.[84] These percentages are applicable only in the event of a commercial discovery. Although these percentages are fixed by law, compensation may be paid either in cash,

through the performance of community projects, any other remuneration scheme not prohibited by law, or a combination.

Article 96 of the Hydrocarbons Law states clearly that exploration and production activities are in the public interest and take precedence over any other use of the surface or subsurface of the land. Accordingly, the investor is entitled after a period of 180 days of negotiation with the landowner to petition the judiciary to declare a legal right of way for hydrocarbons activities in the land in dispute. At this point, mediation before the Ministry of Agrarian, Territorial and Urban Development is also an option. If mediation fails within thirty days, SENER is granted the authority to request the Ministry to take necessary measures allowing for a declaration of a legal right of way for hydrocarbons activities.[85]

In the case of ejidos, if individual landowner rights are recognized in that community, payments may be made directly. If not, then payments will go to the government-administered National Trust for Ejido Development or another entity determined by the negotiating parties.[86] This arrangement invites confusion and difficulty in working with local communities.

Companies will have some flexibility. Landowners can only grant surface access so companies may drill laterals from one site underneath property where they do not have surface access. This may provide some incentive for community cooperation. But the inherent lack of clarity of ownership and the need for companies to engage in public consultations with communities new to development prior to development (required under ISO standards) make the transaction cost of pursuing onshore development high. This may prove a challenge—and a deterrent—for many companies.

The fiscal terms for domestic shale gas development will need to be generous.

Security and access are not inherently damning to unconventional oil and gas development in Mexico. They can be overcome if the fiscal terms of exploration and development contracts take into account the higher risks that come in these areas. Those contracts must also recognize that the unconventional space is undergoing a transition as it matures in the United States. Many of the US independents that have pioneered shale oil and gas development have abundant acreage and commitments to spend their capital in the United States. It may be a challenge to get their boards to agree to a major project in another country with higher risks. Hacienda will need to be sensitive to the fact that fiscal terms will need to be generous, which can mean bids will be low, and security improved to make these shale gas investments attractive.

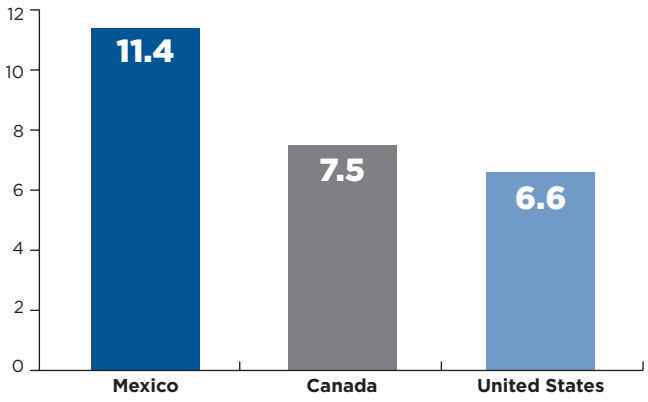
Electricity Reform

The Ley de la Industria Eléctrica, or the Electricity Industry Law,[87] reaffirms the strategic nature of the key aspects of the electricity system—planning, transmission, and distribution—and the continuation of public sector control of these functions. It also sets the principles by which Mexico intends to create a competitive electricity market, which include broader private sector participation. The accompanying Ley de la Comisión Federal de Electricidad (Federal Electricity Commission Law) provides a map for the transformation of CFE from a state monopoly to a state-owned productive enterprise (SPE).

Mexico introduced private competition in power generation in 1992, with the launch of its IPP (independent power producer) program. Since then, IPPs have grown to provide more than 30 percent of Mexico's installed generation capacity. In the last fifteen years, 55 percent of CFE's investment requirements were financed by private investors, either through IPPs or turnkey EPC (engineering, procurement, and construction) contracts.[88] Cogeneration and industrial self-supply projects have also been successful in providing the industry with reliable, lower cost sources of power than those offered by the grid.[89] Gas supply has remained a constraint, with CFE in some cases forced to operate dual-fueled plants on oil, or limit expansion of generation assets due to lack of gas. But CFE has demonstrated an ability to attract and direct private capital flows to achieve its objectives.

The ability of the government to deliver on its promises of lower electricity tariffs—a crucial selling point for the public—will be the single largest determining factor of the energy reforms' success in domestic political terms. Figure 6 shows Mexico's competitive weakness in industrial electricity prices. The primary objectives of the sector restructuring are to lower electricity tariffs and to upgrade the electricity infrastructure. This will empower a more efficient system that is able to capitalize on the country's natural resources, particularly the natural gas expected to become more available as a result of the broader energy reform.

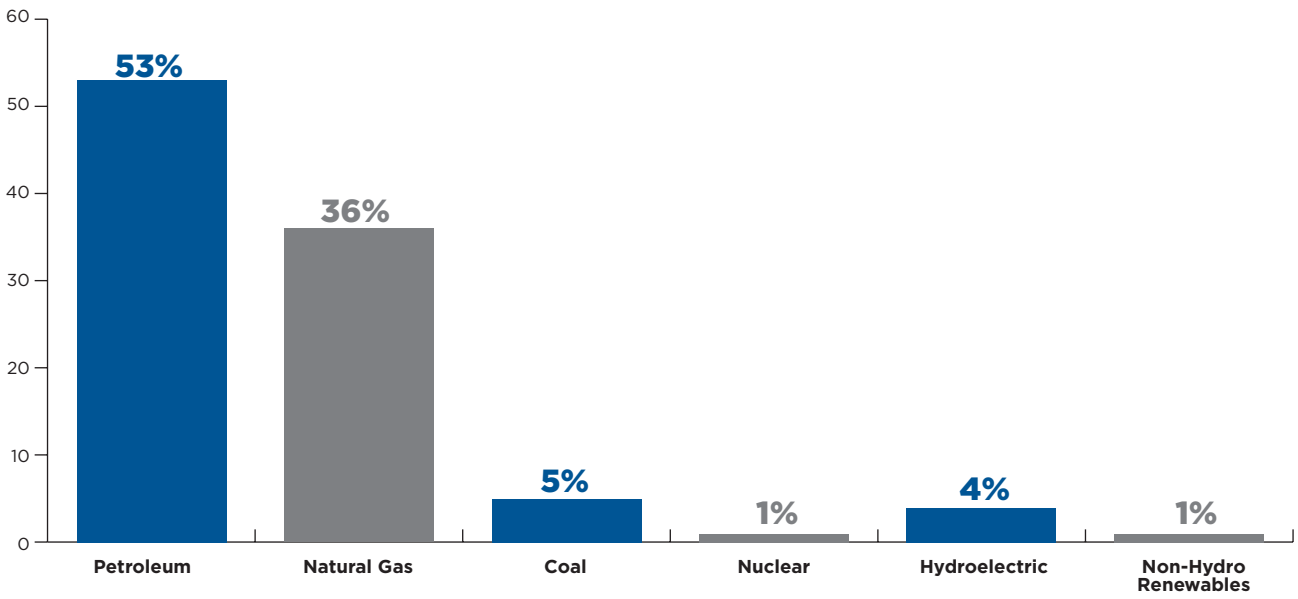
FIGURE 6. North American Electricity Prices for Industrial Users (IN US DOLLARS/MEGAWATT HOUR, 2012)



Sources: IEA and Government of Canada.

The letter from Peña Nieto accompanying submission of the draft Electricity Industry Law to Congress lays out the problem: 20 percent of power is generated by expensive and high carbon fuel oil and diesel. As figure 7 [P. 28] demonstrates, this has serious implications for the competitiveness of Mexico's industrial sector. Mexico's transmission grid suffers from a lack of density (or coverage), with 1.1 percent projected annual

FIGURE 7. Total Energy Consumption In Mexico (BY TYPE, 2012)



Source: US Energy Information Administration.

system growth through 2026 failing to keep up with 4.1 percent projected annual demand growth over the same time period.[90] Forty-one percent of Mexico's transmission lines are more than twenty years old, and only 8 percent have been built in the last five years.[91] Losses in the transmission and distribution system are 21.3 percent, almost twice the Organization for Economic Cooperation and Development (OECD) average.[92] Average tariffs are 25 percent higher than in the United States, despite significant subsidies.[93] Some estimate that without those subsidies, power prices would be as much as 73 percent higher than in the US.[94]

The state monopoly on the electricity sector, implemented by CFE, with its accompanying budgetary restrictions and central planning, has created a bottleneck that limits the pace at which new supply can be added to the system and constrains operational improvements. Today, CFE owns all generation outright or controls it via Power Purchase Agreements, except cogeneration plants and self-supply projects. It also owns all transmission and distribution.

The solution in the legislation is to break CFE's monopoly and liberalize the electricity market, allowing large users and consumers to freely negotiate bilateral supply contracts with private-sector generators and creating a wholesale electricity market, regulated by an ISO that stimulates competition and favors the lowest cost provider.

Legislative Framework

Although the goals of the electricity reform are ambitious, the legislation passed so far is not nearly as specific for the power sector as it is for upstream oil and gas.

In generation, CFE retains all of its existing assets. CFE currently owns or controls (via contracts) 85 percent of generation in Mexico.[95] Existing contracts and projects in advanced

development[96] for IPPs will be respected and continued. Operating self-supply and cogeneration projects may continue as is or enter the wholesale market. Private investment in generation is permitted, with the exception of nuclear energy,[97] and electricity may be imported and bid into the wholesale market. Current barriers to entry, including requirements to negotiate sales ("offtake") contracts with CFE or seek approval for bilateral contracts are eliminated, and CFE's existing and new generation assets will compete on a level playing field with new entrants.

Price alone will determine the priority of dispatch—the source of power used first by the ISO to sell to customers. This arrangement means that the generator that produces power most inexpensively gets to sell first. This is intended to favor generation fueled by natural gas over capacity fueled by higher cost diesel or fuel oil, even if CFE is the generator. Transmission and distribution assets and management are retained by CFE, but CFE may now contract with private sector providers to introduce technology and expertise. For example, post-reform, CFE can hire a private company to reduce transmission and distribution losses in exchange for financial incentives.

The National Energy Control Center (CENACE), currently a part of CFE, will become a decentralized public agency with a constitutional mandate for the planning, control, and operation of the national electricity system. With CENACE as its ISO, a wholesale electricity market will be created to allow trading among market participants that will include generators, qualified users,[98] commercializers, and suppliers.[99]

Qualified users and providers (including CFE) can contract directly or buy and sell electricity through the market. The market will also provide for trading of ancillary services such as frequency and voltage regulation, black start capability (supply used to recover from a blackout or shutdown of the transmission system), demand reduction, and operating and spinning reserves, to facilitate the efficient operation of the system.

CFE will be subjected to strict vertical separation for its activities of generation, transmission, distribution, and commercialization; generation will be separated horizontally to foster free competition; and distribution will be separated regionally, though there is no specific timeline for this.[100] The implementation of this separation and the support offered for CFE businesses to compete with each other is a key component of building a competitive market, given CFE's current monopoly position and that, per the legislation, it will retain all of its assets.

Electricity provision to all residential accounts and consumption below the large or "qualified users" threshold is considered basic service, and their tariffs will be regulated. CFE retains its monopoly on distribution to all customers below the qualified user threshold but may subcontract elements of this to private contractors.

Basic service suppliers must provide electricity to all consumers in their area of operation on a nondiscriminatory basis and must acquire all of their energy via auctions conducted by CENACE specifically for basic service supply.[101] The expectation is that the auctions will comprise CFE's legacy plants and IPPs to ensure that the lowest cost generation is dispatched first to serve the basic service consumers. In the transition period, basic service suppliers also have the option of signing energy purchase contracts with legacy generators.[102]

CRE will determine regulated tariffs for basic service supply and for distribution and transmission that will permit companies to obtain the estimated necessary income to recover efficient costs of operation, maintenance, financing, and depreciation applicable to the various types of service; the technical and nontechnical losses, according to standards set by the CRE; taxes; and

a reasonable, though not guaranteed, return.[103]

CFE's transmission subsidiary is required to interconnect with all facilities that meet CENACE's technical standards, without discrimination, and within a specified timeframe, and in the priority established by CENACE in the market rules.[104] The practical implications of implementing this given the current limitations on grid capacity remain to be seen. Generators and load centers in need of transmission capacity may construct it at their own cost, acquire or sell the transmission rights, or request that it be included in the expansion plans for the national grid.[105]

Fuel switching to natural gas should lower prices and decrease the costs of financing basic user subsidies.

CRE permission is required to import electricity from a power plant located outside Mexican territory and connected exclusively to the Mexican grid.[106] The law is silent on whether facilities connected to the US grid would be permitted to bid power into Mexico. To date, US-based export projects have supplied dedicated industrial customers rather than connecting to the Mexican grid, and have been subject to transmission limitations. The arbitrage between Mexican and US power prices may provide an incentive to export electricity should it be permitted by the detailed regulations and sufficiently attractive to justify the necessary transmission investments.

In the short term, the experience of receiving and paying for electricity most likely will not change for the retail consumer, and CFE will retain responsibility for sales and collections for basic service customers—the sector with the highest tariff subsidies and nontechnical losses. CFE is required to guarantee continuity of electricity supply to basic service users in the event that their supplier goes out of business, until their contract is transferred to another supplier. Fuel switching to natural gas should lower prices and thereby decrease the costs the government will continue to shoulder in financing basic service user subsidies.

Although the reforms call on the government to recalibrate subsidies to focus on those who truly need them, the costs of providing these subsidies is expected to remain high absent any decreases in real electricity costs that only increased adoption of natural gas can realistically provide. There is also a provision for a supplier of last resort for qualified users in the event that their supplier fails to honor its contract; tariffs and maximum prices for these suppliers will be regulated by CRE. Commercial and small industrial customers that meet the new definition of a qualified user will have the challenge and opportunity of managing their electricity purchases from the range of existing and new providers expected to enter the market, and a steep learning curve is anticipated for these users as more of them are phased into the program.

The development and deployment of detailed regulations will be required for the reform to acheive the intended level of competition. In addition to the current ambiguity of the framework, potential private sector developers of electricity infrastructure face the same challenges in terms of land acquisition and acquisition of permits and approvals from multiple layers of officials as discussed earlier for developers of oil and gas assets. Many potential private investors, however, have expressed confidence in the government's

significant progress to date and expect to take advantage of the opportunities provided by the new regime. Whether these new providers actually enter the market; when; and at what scale depends on the nature in which the implementation of the reforms, including the development and content of implementing regulations, progresses.

Policy, regulation, and monitoring of the electricity sector will be headed by SENER and CRE. CRE will define tariff regulations; issue rules for the interaction of generators and distributors; issue permits and model contracts; impose sanctions; authorize auctions; establish interconnection requirements and resolve disputes; and generally regulate the market to ensure its efficient operation. CRE will also set tariffs, with the exception of those that are set by the Federal Executive in order to target vulnerable sectors.[107] SENER will serve as regulator for the first year of operation of the wholesale market, to allow CRE time to complete its transition. The legislation also establishes extensive information requirements, with CRE required to publish its tariff calculations, including the effect of any subsidies.[108] CENACE is required to publish models used to calculate wholesale prices and to develop transmission expansion plans;[109] and SENER is required to publish SPE contracts,[110] among other information.

Mexico's opening to private investment is more limited than, for example, Chile's reforms in its retention of all existing state-owned generation assets and all transmission and distribution capacity for the state. Continued state dominance may limit the dynamism and efficiency of the wholesale market and the entire electricity sector in the early years, and potentially for the longer term.

As Mexico progresses in these reforms, officials will find it beneficial to remember that progress is rarely linear. Countries in the region that have found success reforming their electricity sectors have done so in large part because of their willingness to make adjustments accounting for contingencies that were not foreseen in the legislative and regulatory development phases. For example, Chile has meaningfully amended its electricity law on at least four occasions since it first entered into force in 1982.

Clean Energy

In 2012, Mexico became only the second country in the world (after the United Kingdom) to implement national climate change legislation with legally binding targets of reducing greenhouse gas (GHG) emissions by 30 percent by 2020 and by 50 percent by 2050. Additionally, earlier this year the country unveiled an ambitious commitment to provide 35 percent of its energy from clean sources, (including nuclear and hydroelectric power) by 2024, up from 22 percent today.

Wind power in particular has grown significantly in recent years, with an estimated 2.4 GWh in operation by the end of 2014, of which 600 MW was built by CFE and the remainder through self-supply contracts. The expansion of self-supply contracts for wind power was enabled by incentives including subsidized distribution charges and simplified wheeling (transmission) charges that levy the same amount for transporting electricity generated by renewables to anywhere in the system.

With the new energy reform, all projects with existing interconnection contracts or at an advanced stage of development (see endnote 96) will be respected, but the reform does not address the extension of the existing incentives to future development.

While one of the stated goals of the legislation is to promote clean energy development, the mechanism to do so is undefined. Load centers will be required to ensure that a minimum percentage of their energy consumption is generated by sources with clean energy certificates.[111] The clean energy certificate requirements will apply to suppliers,

qualified users, and end users that generate electricity for their own use. The certificates will be tradable in the wholesale market.

SENER will establish principles for awarding certificates to clean generation sources, which are defined to include hydro, wind, solar, geothermal, biomass, and cogeneration, among others.[112] In the first trimester of every calendar year, SERNA will determine the requirements of acquisition of energy certificates for the following three calendar years, and once set, the required levels may not be reduced.[113] It is not clear how those certificates will be evaluated and awarded, what the required levels will be, or whether there will be sufficient supply and strictly enforced sanctions for non-compliance to support a reasonable price and a robust marketplace to incentivize investment. Indications are that guidelines for issuance of the certificates and incentives for their use may be issued in October.[114]

The basic concept of the scheme implies an expectation that renewable sources will compete with non-renewable sources in the wholesale market, but without specific targets and stiff penalties, renewables projects are unlikely to be dispatched and unlikely to be built. Interconnection barriers will need to be addressed by CFE or the renewable generator with sufficient compensation. Microgenerators can sell locally without requiring a generation permit, and demand reduction will be valued and sold according to CRE regulations.

By being deferred for legislative action, renewable power in Mexico faces an uncertain future. Indications are that the clean energy provisions will be addressed in further legislation in the last quarter of 2014. The PAN recently introduced an early proposal on renewable energy for debate, but with the *Pacto* frayed, its prospects are unclear.

Conversations among Mexican officials and the renewables lobby behind the scenes indicate debate over the merits of continuing subsidies of the renewable industry, reflected in evaluation of the levels of targets and fines for non-attainment, as well as advocacy for an alternative scheme of Power Purchase Agreement (PPA) auctions for renewables along the lines of those conducted by Mexico's neighbors in Central America, and considered successful by renewables proponents. CFE is pushing forward with an ambitious plan to develop additional hydro facilities, and exploiting Mexico's geothermal potential. In Mexico, as elsewhere, there is inherent tension between support for clean energy objectives and political pressure to reduce tariffs. It remains to be seen how Mexico will balance these competing objectives.

Transition

The new secondary laws anticipate a transition period of one to two years before the wholesale market is up and running. That is an optimistic goal given the scope of work required.

Per the legislation, CENACE must be created within six months of the legislation coming into effect[115] and, like CENAGAS, Peña Nieto has indicated a decree for its creation will be issued in August 2014. Within nine months, CRE will issue model contracts,[116] and CENACE will sign contracts with market actors within no more than a three-month period.[117] The transfer of human resources from CFE to CENACE must take place within three months of CENACE's creation.[118]

The sensitivity of the labor transition is addressed with a provision that CFE's governing board approve all changes in personnel or compensation during the transition period,[119] and the law must not negatively affect any past, retired or current CFE employees.[120] The CFE labor union will have a seat in the Administrative Council. Members of the electricity industry will be included in the board of directors of CENACE, one third of which will be represented by independent advisers.[121]

CFE will be under pressure to generate a profit,

and its various subsidiaries will be evaluated against respective target rates of return established by Hacienda. Failure to meet those objectives for a two-year period may result in a temporary freeze on new investment.[122] CFE expects to recover its costs and to be reimbursed by Hacienda for the cost of the retail consumer price subsidies.

Given the political pressure to demonstrate tariff reductions, and the significant spending required to modernize the country's power infrastructure, the expectation is that subsidies will continue but may be retargeted. Mexico may move from providing all residential consumers with subsidized power to a more targeted system where those in need of income support get a voucher as with the US Low Income Home Energy Assistance Program,[123] or a fixed amount of free power known as a lifeline tariff. That debate is deferred for now. Public statements from members of the administration have indicated that tariffs are to be reduced within two years of the legislation becoming law. Some members of the public are upset that it has not happened already.

The legislation takes a significant step in establishing CENACE as an independent operator and CRE as an independent regulator.

Power Sector Challenges and Opportunities

Mexico's policymakers are wise to understand that the power sector reform is a long and complicated process, and it will likely require continual improvement and even additional legislative intervention over a period of many years to perfect a system that provides real competitive benefit for the country.

The reform in the electricity sector has the potential to transform the productive base of the country, and it is a big bet on natural gas fueling Mexico's future. If the government is successful in removing constraints on natural gas supply, providing fair and balanced regulation of the market, and fostering real competition to drive wholesale electricity prices down, while retaining public support for the process, Mexico will be well-positioned to achieve the many economic and job growth benefits promised to its population as part of this reform.

Mexico faces a number of challenges in fully engaging the private sector to achieve these development goals. Mexico is embarking on a significant investment program (relying on natural gas) and has an explicit goal of strategic partnerships with the private sector, offering investment opportunities for private contractors in the transmission and distribution sectors and developers of new generation and pipeline assets. Ending CFE's monopoly on generation is the crucial step in introducing transparency and accountability into the sector, and it lays the foundation for a reckoning of the true cost of resolving Mexico's infrastructure deficit.

The return objectives for state-owned productive enterprises will provide a basis for measuring their success and encouraging improvement. This is particularly relevant in light of CFE's losses in 2013, which totaled a net loss of 37 billion pesos, or about $2.8 billion.[124] The designation of the country's lowest cost generation for fulfillment of basic service requirements will mean even higher electricity prices from remaining generation for non-residential consumers. This will incentivize replacement of CFE's obsolescent generation capacity with more competitive options, including

conversion of CFE oil-fired generation to gas (assuming sufficient supply) and independent competition. There is the short-term risk, however, of disincentivizing some of the small-scale economic development the country hopes to support with this reform, without subsidies to smooth the transition.

Mexico's wholesale electricity market is at least two years away from entering into operation, and the regulations and rules that will define it have yet to be written. The legislation takes a significant step in establishing CENACE as an independent operator and CRE as an independent regulator with real power to govern market interaction and impose sanctions. Demonstration of their independence and power in the initial stages of the reform will be key to investor confidence.

The government's commitment that CFE will retain all of its assets poses a significant constraint on the development of a competitive wholesale market. At the outset of the market, one market actor will control 85 percent of generation capacity. The legislation's requirement that CFE be separated vertically and horizontally; that there be open access to the transmission system; the creation of an ISO and independent regulatory bodies; and the extensive public information requirements are all important components of supporting the transition from a state-dominated system to a competitive market. They represent a positive effort to limit the potential for CFE to exert excessive and potentially manipulative control over the sector, and to provide as level a playing field as possible for new entrants, to stimulate efficient competition.

CFE retains many of the legacy burdens of a large workforce and the obligation to supply the subsidized and losses-heavy residential sector, as well as the benefits of its existing power generation assets and gas supply contracts, and monopoly control of the distribution and transmission assets (albeit by separate legal entities). Time, and the development and implementation of detailed regulations, will tell how CFE leverages its assets and manages its liabilities in the new environment and how private actors have incentive to compete.

The commitment to source basic service contracts—comprising 90 percent of customers and 30 percent of revenues[125]—via dedicated auctions takes a large amount of capacity out of the wholesale market. Allowing continued bilateral contracts between qualified users and providers as well as continued self-supply projects removes even more. In the near term this may mean that the wholesale market operates on a provisional basis, more as a balancing market rather than a large-scale competitive one, advancing slowly as the generation sector develops primarily via regulated auctions and bilateral contracts.

While the regulations that will govern the sector in the future are still being developed, immediate opportunities appear in serving CFE's infrastructure expansion in midstream gas pipelines, transmission and distribution grid expansion and gas-fired generation; in businesses that will commercialize power for the large and growing qualified users sector; and in developing additional generation for self-supply and bilateral contracts. There may also be an attractive opportunity for near-term electricity imports from the United States.

Significant competition is expected in serving the industrial market and some participants may even accept sub-market returns to participate, driving prices down. There is also a clear need for companies to provide outsourced services to CFE in loss reduction and energy commercialization, and to CRE and CENACE in consultative and other services on the market's evolution and management.

Conclusion and Recommendations

Mexico has made tremendous strides in addressing the questions that emerged following the constitutional amendments.

In our earlier paper, we identified seven principal questions. The secondary laws answer three of those questions—would the laws truly liberate PEMEX to act independently, would the fiscal framework trust the market, and would local content requirements be manageable?—in the affirmative. Two others —can Mexico offer competitive fiscal terms, and can it build effective regulators?—now have solid legal foundations and committed political leadership. So, we are optimistic. The final two questions—can the Peña Nieto administration manage public expectations and can it offer a compelling value proposition for electricity sector investors—remain to be addressed.

In coming this far, Mexico has accomplished an amazing political feat by passing comprehensive energy reform. Despite the heavy burden on the Peña Nieto administration to implement these reforms, it has exceeded expectations every step of the way. On the day Peña Nieto signed the secondary legislation into law, his administration also announced that Round Zero would be completed a full month early and that acreage to be tendered in Round One would be released immediately. The budgets and staffs of SENER, Hacienda, and CNH have increased this year and next, with significant budget for CNH to hire outside advisors for legal and other support. Ministry and regulatory officials fully understand the challenge ahead—and the need to be flexible and quick to accomplish their goals.

Looking ahead, with major political compromises now behind them, Mexico must take six urgent steps to assure the success of the reforms.

- **Ensure fiscal and contract terms are competitive.** Hacienda's discretion in setting fiscal terms, CNH's contract language, and the Economy Ministry's local content definitions of targets and eligible content will determine the success of the early bid rounds. All must show market savvy in tailoring terms to differentiate the diverse risk profiles of acreage offered, return long-term value, and be competitive with what Mexico's peers offer.

- **Let PEMEX evolve.** PEMEX must be allowed to become an efficient company and not the government's policy instrument. PEMEX enters into a new competitive marketplace with tremendous advantages, but it also remains vulnerable to political and bureaucratic interference. PEMEX must be allowed to improve efficiencies, allocate capital according to its own strategic planning, and not be required to take on investments dictated by the government. PEMEX must also focus on its core mission. Recent indications that PEMEX may secure its own drilling, logistics, worker hotel, and tugboat companies suggest the challenges of moving beyond its monopoly perspective.

- **Build regulatory capacity.** CNH, CFE, CENAGAS, and CRE must grow their internal staffs to manage the increased workload and promulgate new, best in class, implementing regulations quickly. This is a goal Peña Nieto

embraced when he announced that all regulations will be promulgated by October 2014 to encourage quicker private investment. All of these agencies will need significant external assistance in the coming months to meet this task. Meeting these needs is on track: Hacienda is adding up to 80 personnel into a dedicated unit, CNH's 2015 budget will be five times higher, and CRE's two times. Supplemental budget financing has also been provided for the remainder of 2014.

- **Issue implementing regulations quickly.** A near-term spike in interest, including in conversion of existing service contracts, should be expected but no serious investment will not reach scale until the regulatory framework is clear. All of the rules for oil and gas exploration, energy transportation, and safety and environmental protection must be tailored for a system with nongovernmental actors. Although the Mexican government is likely already at work on these, it is a formidable task. Rules must be consistent with the newly drafted laws, efficient in practice, and be promulgated quickly. For example, the details of how people, goods, and services can be brought into the country will determine the cost structure (or economics) of operating in Mexico. The length of time it takes to get a permit for operating will determine when work—and the economic stimulus the population expects—will begin.

- **Develop the electricity sector reform strategy and expedite regulations.** Establishing clear and transparent regulations over access to gas and transmission for private generation will be critical to encouraging private investment in generation in a market currently dominated by CFE. The Mexican government should lay out a roadmap with clear milestones and timetables to make the power sector strategy clear. These could include provision of detailed open access rules; the pricing regime for transmission and gas pipelines; and the plans for the build out of transmission and pipeline capacity. Beyond the regulations, the actions of the government and the regulators in the initial phases of the transition will be key to demonstrate that the legislation has teeth, that open access will be provided, and that the regulators will exercise their powers independently to ensure a competitive enivronment. Further information on the renewables policy and on subsidy retargeting will also be crucial to investors' analysis.

- **Create a security strategy for energy investment areas.** Mexico's internal security and the success of energy reforms are intertwined. The government needs to publicly describe how it will secure pipelines, areas of onshore exploration, and land bases for deepwater development. So long as risk premiums around security are high, production will lag and government rents will be low.

The United States has deep interests in Mexico's prosperity, security, and stability and can speed the success of Mexico's reforms. At the same time, the United States must be sensitive to Mexico's sovereignty and historic skepticism of foreign investment. The United States should be prepared to help in three ways if Mexico seeks cooperation:

- **Facilitate regulatory harmonization on North American energy integration.** Mexico's energy reforms will eventually invite further integration with the United States and, by extension, Canada. Rationalizing natural gas, crude oil, product, and electricity trade will be increasingly important as Mexico increases production, demand, and further links to Central

American markets. Crude oil should be an area of early examination. The United States retains a need for imports of heavy oil, and Mexico needs lighter oils to blend with its crude streams to create more marketable exports to the global market. These requirements beg for clear rules for swaps of oil and re-exports of oil and gas. In addition, cooperative investment on natural gas transportation could enhance Mexico's role as an energy bridge to the Americas. Trilateral dialogue, including the potential for a natural gas network from Calgary to Colombia, should be on the agenda for the 2015 North American Leadership Summit.

- **Fast track gas pipeline border crossings.** The United States should facilitate gas trade with Mexico, which is a near-term priority since increasing its domestic production will take some time. The Federal Energy Regulatory Commission should increase its capacity to issue cross-border pipeline permits given the likelihood of increased Mexican demand for US gas. State-level authorities must also be prepared for an increase in pipeline permit applications.

- **Offer technical assistance if requested.** While it may seem obvious, the long regulatory experience in the United States could be of use to Mexico. This means making US regulators privately available to engage with Mexican officials and provide lessons learned and assistance to Mexican agencies and regulators as they begin efforts to draft regulations and implement the reforms.

The succession of structural reforms Mexico has produced is transforming its international stature. Effective governance, even if mediated by robust political competition, is on the rise and Mexico can become a significant new magnet for foreign investment. The energy sector itself will attract foreign investment, but the prospect of lower priced and more reliable electric power, plus a recovering US economy to supply, will give investors in non-energy sectors confidence that Mexico will be a manufacturing destination of choice.

Mexico's revival will also positively impact global energy security. Market analysts who projected Mexican production declines will now factor in rising production, creating downward pressure on the need for OPEC production and oil prices more broadly, and positioning Mexico to take advantage of rising demand across the Pacific. Mexico's deepwater program should produce significant volumes by 2025, the point at which many forecasters have targeted as the peak of US unconventional production. Mexico therefore will become a strategic supplier of oil just as US production plateaus, extending the run of North American energy self-sufficiency at an optimum moment.

With a constitutional mandate, a comprehensive legislative framework, and impressive and courageous leadership and governance, there are no question marks left on whether Mexico's energy reform will proceed. The countdown is over. Mexico is ready to launch.

Endnotes

1 US Energy Information Administration, "Mexico: Overview," http://www.eia.gov/countries/cab.cfm?fips=mx; "Mexico Supreme Court Allows New Private Service Oil Contracts," *Wall Street Journal*, December 8, 2010, http://online.wsj.com/news/articles/SB10001424052748703493504576007781863133572.

2 For a comprehensive discussion of the Constitutional reforms, see David Goldwyn, *Mexico Rising: Comprehensive Energy Reform at Last?* (Washington, DC: Atlantic Council, December 2013), http://www.atlanticcouncil.org/images/publications/Mexico_Rising.pdf.

3 Kenneth Culotta and Adrian L. Talamantes, *Mexican president Enrique Peña Nieto promulgates secondary oil and gas legislation*, King & Spaulding, August 12, 2014.

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5 The new law governing Pemex and CFE is available in full in Spanish at http://dof.gob.mx/nota_detalle.php?codigo=5355990&fecha=11/08/2014.

6 The Constitutional reforms mandate the transition of Pemex and CFE into state-owned productive enterprises, a new category of institution with a mandate to create economic value and increase revenues, rather than simply exert nationalistic control over resources. See amended Articles Twenty-Five and Twenty-Seven of the Mexican Constitution.

7 See the initial report, *Mexico Rising: Comprehensive Energy Reform at Last?*, for analysis of the constitutional reforms. Notably, that paper discusses creation of the Mexican Petroleum Fund for Stabilization and Development, which is not detailed in this paper. The Fund is set to be formally established in September 2014.

8 Elisabeth Malkin and Michael Corkery, "Mexico Authorizes Arrests in Fraud at Citigroup Unit," *New York Times*, June 1, 2014, http://dealbook.nytimes.com/2014/06/01/mexico-issues-arrest-warrants-in-banamex-fraud-inquiry/; Juan Montes, "Mexican Leftists Warn Investors About Energy Sector," Wall Street Journal, May 29, 2014, http://online.wsj.com/articles/mexicos-left-goes-to-washington-1401395473; E. Eduardo Castillo, "Mexico Divided Over Debating Historic Energy Reform While Mexicans Glued to World Cup," Associated Press, June 11, 2014, http://www.startribune.com/sports/soccer/262594191.html#tiq82akdXRQb8uf5.97; Jude Webber, "Mexico's Energy Reform: Wading through Mud," Beyondbrics (blog), Financial Times, June 18, 2014, http://blogs.ft.com/beyond-brics/2014/06/18/mexicos-energy-reform-wading-through-mud/; Laurence Iliff and Amy Guthrie, "Oil-Tinged Graft Scandal Roils Mexico," Wall Street Journal, May 29, 2014, http://online.wsj.com/articles/oil-tinged-graft-scandal-roils-mexico-1401409692.

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10 Cory Siskind, "To Reform Mexico's Economy, Peña Nieto Must Tackle 'Culture of Monopolies,'" *World Politics Review*, December 4, 2012, http://www.worldpoliticsreview.com/articles/12539/to-reform-mexicos-economy-pena-nieto-must-tackle-culture-of-monopolies; Nick Miroff, "Mexico's President Enrique Peña Nieto Slumps in Polls Despite Policy Wins," Washington Post, April 13, 2014, http://www.washingtonpost.com/world/mexicos-president-enrique-pena-nieto-slumps-in-polls-despite-policy-wins/2014/04/13/4d1c9f53-bafc-4d2e-9ad7-543a5e315899_story.html.

11 Article 28 of the Mexican Constitution mandates the establishment of the Mexican Oil Fund, officially known as the Mexican Petroleum Fund for Stabilization and Development. The Fund will be administered by Mexico's independent Central Bank, and Hacienda is tasked with building mechanisms to send all oil revenues (except taxes) to the fund, which will then redistribute them based on a set hierarchy of obligations established in the reforms. The secondary law which lays out the mechanics of the Mexican Oil Fund is available at: http://dof.gob.mx/index.php?year=2014&month=08&day=11&edicion=VES.

12 The new laws are available in their entirety in Spanish at: http://dof.gob.mx/index.php?year=2014&month=08&day=11&edicion=VES.

13 The Constitutional reforms mandate the transition of PEMEX into a state-owned productive enterprise. The mechanics of this transition and its implications are further laid out in the reform law addressing changes to Pemex and CFE, which is available at: http://dof.gob.mx/nota_detalle.php?codigo=5355990&fecha=11/08/2014.

14 Hydrocarbons Revenue Law, Article 39 : Transitory Eight.

15 Pemex Law Article 15.

16 Ibid.

17 Two of the government board members are required to be the Minister of Energy and Minister of Finance and Public Credit. Pemex Law Article 15(I).

18 Pemex Law Article 47.

19 CFE Law Article 14.

20 Nominations for independent directors for PEMEX and CFE are expected to be sent to the Senate in August 2014.

21 Authorization to create subsidiaries, which are state-owned productive enterprises tax the investor under federal law, and affiliates, is found in PEMEX Law Article 59. For press coverage, see "Mexico's Premex to Launch Transport, Drilling Companies in 2015—Radio," Reuters, August 4, 2014, http://af.reuters.com/article/commoditiesNews/idAFL2N0QA0LF20140804; "Premex Weighs Business Plans," August 5, 2014, News, http://thenews.com.mx/index.php/mexico-articulos/24832-Pemex-weighs-business-plans.

22 PEMEX must turn its information over to CNH within ninety days of the passage of the Hydrocarbons Law but must operate the facility for a year until CNH has a new vendor.

23 Hydrocarbons Law Article 17 states that PEMEX or another state entity is mandated to participate. This provision reflects the long-held public concern that Mexican resources could be drained from the other side of the border, and practically ensures that PEMEX will be a partner in any unitization agreement established under the US-Mexico Transboundary Agreement. Currently some disagreement exists between officials as to whether the law mandates PEMEX participation or whether it mandates that PEMEX participation be made possible.

24 Hydrocarbons Law, Article 16.

25 Hydrocarbons Law Article 122.

26 There are provisions in the law that can limit the ability of PEMEX to grow exceedingly dominant over the sector. The law allows for the creation of other SPEs. Norway created Petoro, an entity to hold the state's financial interest in certain assets to create a more competitive sector. Brazil created Pré-Sal Petróleo SA to hold its presalt assets for the same reason. Mexico may decide in the future to create a new SPE to own its entitlements under production sharing agreements, although that is not contemplated at this time.

27 Authorization provided in Hydrocarbons Law Transitory 28.

28 Hydrocarbons Law Article 13.

29 US Energy Information Administration, "Mexico: Overview."

30 Chevron, "Chevron Reports Second Quarter Net Income of $5.7 Billion," news release, August 1, 2014, http://phx.corporate-ir.net/External.File?item=UGFyZW50SUQ9MjQ1NDkzfENoaWxkSUQ9LTF8VHlwZT0z&t=1.

31 The government has broad authority to revoke PEMEX's entitlements for its asignaciones (entitlements Pemex won in Round Zero and did not migrate to new contracts). Unlike open tenders for contracts in subsequent rounds, revocation of entitlements has no obvious arbitration mechanism.

32 Pemex Law, Article 101.

33 Pemex Law, Article 103.

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35 "Round Zero Results Announced and Round One Initiates," legal brief transmitted to Goldwyn Global Strategies by López Velarde, Heftye y Soria, S.C. via e-mail on August 14, 2014.

36 Thorough explanation of the terms "proved" and "probable" reserves as they are understood in energy sector parlance are available at http://www.eia.gov/tools/glossary/.

37 Adam Williams, "Pemex Granted All Probably Reserves Sought in Oil Opening," Bloomberg, August 13, 2014, http://www.bloomberg.com/news/2014-08-13/pemex-s-production-future-set-at-21-share-of-potential-deposits.html; "Round Zero Results Announced and Round One Initiates," legal brief transmitted to Goldwyn Global Strategies by López Velarde, Heftye y Soria, S.C. via e-mail on August 14, 2014.

38 These are the most likely vehicles for deepwater projects. In the case of production sharing contracts, the government's share will be marketed by PEMEX for at least the first three years of the new legal regime. Thereafter, other entities may be chosen to market the product, including private companies, but it is expected that the government of Mexico will continue to prefer to use its state-owned outlet.

39 Second Title, Chapter II, Article 26 of the Hydrocarbons Revenue Law.

40 Marginal wells can include those at the tail end their productive life where a producer must spend more, by injecting more water or gas or conducting specialized drilling, to extract the remaining hydrocarbons. The Hydrocarbons Revenue Law provides for reduced duty rates.

41 The adjustment mechanism serves as factor that can multiply one of the payments to the government.

42 Energy companies will be allowed certain special deductions, including depreciation of wells (25 percent) and storage and transportation (10 percent), and an immediate write-down of exploration costs.

43 For the crude oil rate, see Article 24 (I) of the Hydrocarbons Income Law. For the condensate rate, see Article 24 (III) of the Hydrocarbons Income Law.

44 The formulas to determine royalty rates at prices exceeding $48 USD/bbl for crude and $60 USD/bbl for condensate are available in Article 24 (I) and Article 24 (III), respectively, of the Hydrocarbons Income Law

45 For a comprehensive discussion of the this, see the "Revenue Management" section, pages 13-14, of David Goldwyn, *Mexico Rising: Comprehensive Energy Reform at Last?*.

46 Hydrocarbons Revenue Law, Article 19(XIII).

47 Article 118-121 of the Hydrocarbons Law.

48 Title Five, Article 70 of the Hydrocarbons Revenues Law.

49 Second Title, Chapter II, Article 19, Item XIV of the Hydrocarbons Law.

50 Noe Torres, "Mexico's Senate Committees Approve Energy Reform Bills," Reuters, July 15, 2014, http://www.reuters.com/article/2014/07/15/mexico-reforms-idUSL2N0PQ21U20140715.

51 Hydrocarbons Law Article 46 and Transitory 24. Additionally, Article 46 of the Hydrocarbons Law identifies five criteria for considering domestic content: goods and services, skilled and unskilled labor, workforce utilization, local infrastructure investment, and technology transfer.

52 Hydrocarbons Law Transitory 18.

53 Up 10-20 percent of the revenues resulting from noncompliance. Article 156, Para VIII.

54 Article 125 of the Hydrocarbons Law.

55 Hydrocarbons Law Article 51.

56 Hydrocarbons Law Transitory 13.

57 As described above, the National Agency for Industrial Safety and Environmental Protection also plays a regulatory role.

58 Hydrocarbons Law Article 48(I).

59 Hydrocarbons Law Article 80.

60 Hydrocarbons Law Article 48(II).

61 Hydrocarbons Law Article 81.

62 Hydrocarbons Law Article 70 and deadline in Transitory 15.

63 Hydrocarbons Law Article 70.

64 Hydrocarbons Law Article 71.

65 Hydrocarbons Law Article 60-63.

66 Hydrocarbons Law Article 48(II), 52.

67 Hydrocarbons Law Article 62.

68 Hydrocarbons Law, Transitory 14.

69 Hydrocarbons Law, Transitory 14, Point I, Item B.

70 US Department of Energy, *Technically Recoverable Shale Oil and Shale Gas Resources: An Assessment of 137 Shale Formations in 41 Countries Outside the United States* (Washington, DC: June 2013), http://www.eia.gov/analysis/studies/worldshalegas/.

71 "Natural Gas Tenders in Mexico 2014," presentation by Comisión Federal de Electricidad, 2014.

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75 Hydrocarbons Law Article 66-69.

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77 Hydrocarbons Law Transitory 12.

78 Hydrocarbons Law Chapter IV.

79 Hydrocarbons Law, Article 71.

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83 Hydrocarbons Law, Article 101(VI)(c).

84 Land owners can be compensated for the land itself but not for the subsoil minerals. Hydrocarbons Law 101(IX).

85 Articles 96, 106, 107, 108, 109 of the Hydrocarbons Law

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92 Ibid., p.5.

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94 Eric Save, Michael S. Hindus, and John B. McNeece III, "Proposed Implementing Legislation for the Mexican Energy Reform Will Creat an Open, Competitive Electrical Power Industry," Pillsbury, June 26, 2014, p. 3, http://www.pillsburylaw.com/siteFiles/Publications/AdvisoryJune2014CorporateSecuritiesProposedImpendingLegislationfortheMexicanEnergyReform.pdf.

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96 The project must have requested and/or received permission to generate or won it via a CRE auction prior to the new legislation being passed; inform CRE within sixty days following the new legislation being passed of its intent to continue the project; and must demonstrate complete financing and the investment of at least 30 percent of project costs by 12/31/16. In these cases it may celebrate an interconnection contract for up to twenty years. Such contracts will be cancelled if the project does not enter into full operation by December 31, 2019. These periods may be extended by CRE. (Electricity Law, Transitorio, Decimo Tercero). CFE will complete the RFP process for capacity investments included in the 2015 budget (Electricity Law, Transitorio, Decimo Octavo).

97 Mexico has one 1,400 MW nuclear plant that provided 3 percent of installed capacity and 5 percent of total GWh generated in 2012. Construction of new plants is as challenging in Mexico as elsewhere in the world given safety considerations, particularly after Fukushima.

98 Qualified users are defined as electricity consumers that will consume 3 MW or more at the start of the wholesale market. This threshold will decrease to 2 MW at the end of one year of operation, and 1 MW at the end of two years of operation. Companies that meet or exceed this threshold are authorized, pursuant to the Electricity Law, to purchase power directly from the wholesale market. Users below the threshold must continue to purchase power from commercializers of the basic service. (Electricity Law, Transitorio, Decimo Quinto)

99 Electricity Law, Article 3, XXVIII.

100 Electricity Law, Transitorio, Cuarto.

101 Electricity Law, Article 53.

102 Electricity Law, Transitorio, Decimo Noveno.

103 Electricity Law, Article 140.

104 Electricity Law, Article 33.

105 Electricity Law, Article 34.

106 Electricity Law, Article 17.

107 Electricity Law, Article 139.

108 Electricity Law, Article 139.

109 Electricity Law, Article 160.

110 Electricity Law, Article 161.

111 Electricity Law, Article 122. Guidelines for clean energy certificates are scheduled to be released in October 2014.

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117 Electricity Law, Transitorio Octavo.

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