

# A Brighter Future for Mexico: The Promise and Challenge of Electricity Reform

BY LISA VISCIDI AND PAUL SHORTELL\*



This publication is a product of the Inter-American Dialogue's program on Energy, Climate Change and Extractive Industries, which seeks to improve understanding and communication on energy policy issues in Latin America through research, public events and roundtable discussions. By producing balanced analysis and convening policymakers, corporate leaders and industry experts, the program informs and shapes policies that promote investment while encouraging economically, socially and environmentally responsible development of natural resources.

While Mexico's oil and gas reform has stolen the limelight both at home and abroad, the electricity reform is arguably more critical to the country's economic growth, trade and fiscal budget. High power generation costs, deficient infrastructure, and barriers to competition are leading Mexico on a path toward soaring industrial electricity tariffs and unsustainable energy subsidies. In a sweeping overhaul of the country's framework for the electricity and hydrocarbons sectors, Mexico's Congress in December 2013 approved constitutional reforms that would increase private participation in generation, transmission and distribution and restructure electricity institutions in an effort to promote investment in new energy sources, particularly natural gas and renewable energy.

In the long term, this vital reform should reduce electricity prices for the key industrial sector, alleviate operational and budgetary constraints for CFE, and move Mexico toward a cleaner energy matrix. But while the government has taken important steps toward establishing the right energy framework, much work remains to be done—and the many potential challenges and uncertainties mean that the reform is unlikely to bear fruit in the short term. The Mexican government, having promised that the reform will lead to lower electricity prices within two short years, must set more realistic expectations to maintain public support over the long term.

## The Need for Electricity Reform

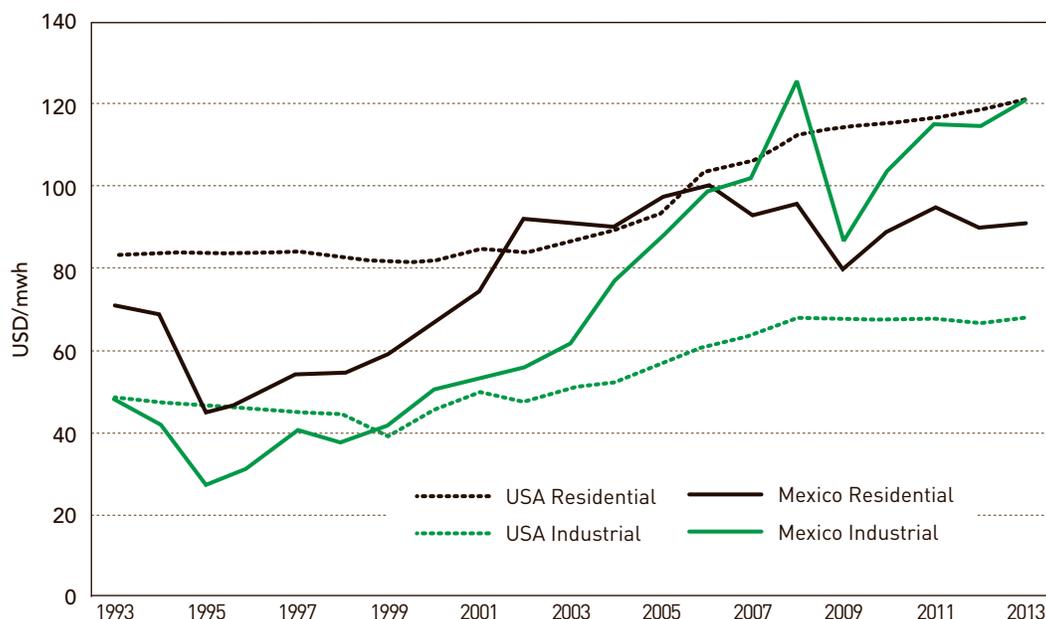
With power demand projected to grow by 4 percent annually between 2012 and 2026, Mexico needs to invest in its crumbling electricity grid and increase generation capacity to expand supply and lower costs. Electricity prices for the industrial sector—which employs a quarter of Mexico's work force and accounts for 93 percent of exports—have increased nearly threefold since 2002 and are almost double those of its main trading partner, the United States. Meanwhile, Mexico's average residential rates are low, thanks to significant subsidies that take a toll on public finances.

High electricity generation costs stem in part from Mexico's heavy reliance on expensive oil products, which account for some 20 percent of power generated by the state-owned Federal Electricity Commission (CFE), although oil's share in the matrix has gradually declined over the past decade. The use of oil as well as coal for power generation is also a key contributor to Mexico's greenhouse gas emissions, which are 38% higher per capita than the average for Latin America and the Caribbean.

Mexico can reduce emissions while increasing power supply by replacing oil-fired generation with lower cost, cleaner burning natural gas or renewable energy. Mexico boasts sizeable undeveloped reserves of conventional gas and an

\* Lisa Viscidi is Program Director and Paul Shortell is Program Assistant of the Energy, Climate Change and Extractive Industries Program at the Inter-American Dialogue.

**Figure 1. Industrial and Residential Electricity Tariffs in the United States and Mexico, 1993–2013**



Source: Secretaria de Energía de México (SENER) and United States Energy Information Administration (EIA).

impressive 545 trillion cubic feet of technically recoverable shale gas reserves, the sixth largest in the world. However, while gas demand is on the rise, declining domestic production and a lack of pipeline infrastructure have led Mexico to import some 30 percent of total gas consumption, including pipeline imports from the US and expensive liquefied natural gas from other countries.

A lack of investment in electricity infrastructure also imposes heavy costs. According to government projections, the grid will be expanded at an average rate of only 1 percent per year through 2026, which experts say is insufficient to meet rising demand. Nearly half of the country’s transmission lines are more than twenty years old, contributing to technical losses averaging 15 percent, almost double the OECD average. Another 6 to 7 percent of capacity is lost due to illegal access, poor metering and incorrect billing.

CFE’s control of most power generation and its monopoly over transmission and distribution have impeded investments in new power plants and other infrastructure. Until

now, private power generation has been allowed only under limited schemes, such as self-generation and small independent power producers generating under 30 MW. A lack of market competition for power generation contracts leads to inefficient practices, such as the continued operation of obsolete plants.

CFE also faces an unsustainable financial burden that prevents it from making crucial investments. Regressive subsidies to residential and agricultural consumers set by the Secretariat of Finance and Public Credit (SHCP) create liabilities for CFE that well exceed its earnings. This widening gap—which is covered by Mexican taxpayers—has caused the company’s equity to plummet by nearly 50 percent between 2007 and 2012. And a clientelistic relationship between CFE and the electricity workers union, SUTERM, has resulted in a bloated workforce, whose productivity is an eighth that of Chile’s Endesa and a third that of Brazil’s Eletrobras, according to Mexico’s Center for Development Research (CIDAC).

## Peña Nieto Introduces Crucial Overhaul

In a bid to reverse rising costs and dwindling investment, President Enrique Peña Nieto has led an ambitious campaign to increase private participation in the power sector and improve the operation of CFE. After approving constitutional reforms in December, Mexico's Congress is now poised to pass secondary legislation that will further shape and clarify the sector's restructuring. The Peña Nieto administration has promised that the reform will reduce natural gas and electricity prices within two years of approval, allow for the construction of 10,000 kilometers of new natural gas pipelines, and boost domestic gas production by more than 25 percent by 2018. More private investment could expand Mexico's generation capacity, encourage the integration of natural gas and other low-cost generation sources, and speed the retirement of obsolete plants.

Under the reform, Mexico will establish a wholesale generation market, creating competition which should lead to lower average electricity costs over time. CFE will compete alongside private entities for generation contracts and the National Center for Energy Control (CENACE), currently an entity within CFE, will become an independent system operator that manages the wholesale market, guarantees open access for new generators and handles national grid planning. Large industrial consumers will for the first time be able to purchase power directly from any generator or via independent suppliers, while CFE will continue to supply small to medium enterprises and residential consumers at subsidized rates. CFE will also act as a supplier of last resort in case of national emergencies.

CFE will maintain its transmission and distribution networks but will have the ability to contract with private companies for the construction, maintenance, and operation of the national grid, which should help reduce technical losses and expand transmission lines. The reform will also allow private generators to independently construct and operate transmission lines connected to the grid. This will reduce barriers to constructing new generation projects, particularly for renewable energy sources in remote locations.

The reform also presents a roadmap for restructuring public institutions in the electricity sector. CFE will become a "productive state enterprise" with operational and budgetary autonomy from the federal government. Four non-government representatives will be added to its board and SUTERM's delegation will be reduced from three seats to one. The Energy Regulatory Commission (CRE) and CENACE will gain greater independence and take on a broad range of new regulatory and operational responsibilities.

Electricity prices for the industrial sector—which employs a quarter of Mexico's work force and accounts for 93 percent of exports—have increased nearly threefold since 2002 and are almost double those of the United States.

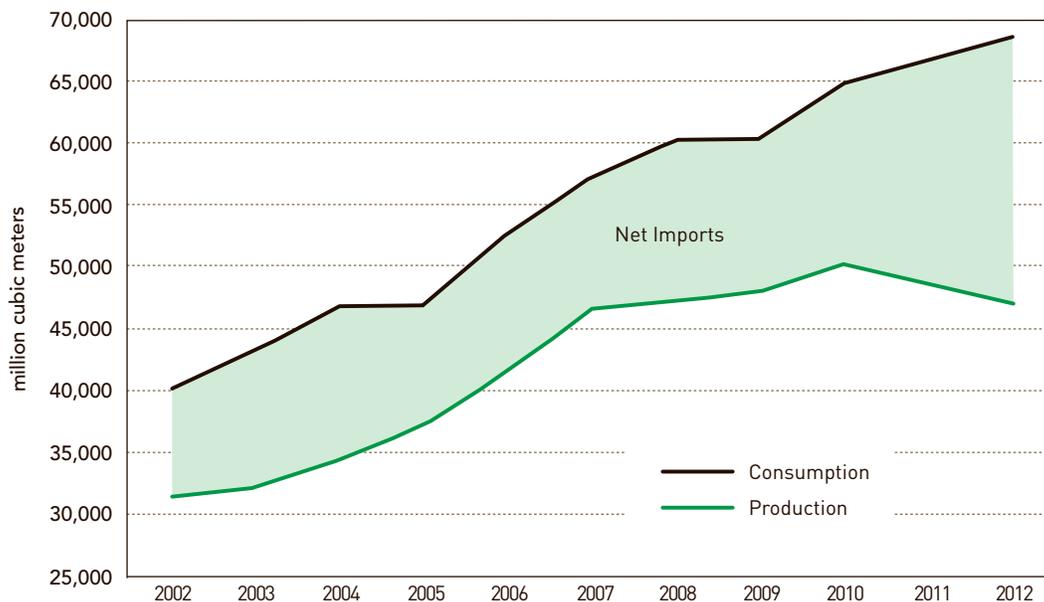
## Obstacles to Implementation Remain

While the reform's approval is a major triumph, its implementation will entail a complex process whose benefits will take years to materialize. The process for setting up the new framework, awarding contracts, building new power plants and expanding infrastructure will be lengthy. Moreover, the extent to which the reform will attract private investment and increase installed capacity of cleaner energy sources is still unclear. Key obstacles and uncertainties include:

### Timing

Peña Nieto's promise of lower electricity prices within two years of the reform's approval is unlikely to materialize given the long timeline needed to establish the new framework. The complex process of sector restructuring and rulemaking alone could last two years or more following the passage of secondary legislation. This process includes the transfer of resources and responsibilities from CFE to CENACE, which will be managed by the Secretariat of Energy (SENER). Transitory laws allow an 18 month window for the process, but inefficient coordination or failures of individual agencies to meet their legal deadlines could cause further delays.

**Figure 2. Production and Consumption of Natural Gas in Mexico, 2002–2012**



Source: Secretaría de Energía de México (SENER).

Once the wholesale electricity market for large industrial consumers is formally established, regulators will need to set up and conduct bidding rounds for contracts and approve environmental licenses. Developers will then construct new plants and supporting infrastructure before additional installed capacity finally comes online. Accounting for these activities, independent experts estimate that the timeline for industrial electricity tariffs to decrease will be around five to ten years. The costs of providing power to residential and smaller industrial users may decline even more slowly because they will still be supplied by the CFE rather than the competitive wholesale market. Given Mexico's substantial subsidies, it is unlikely that the costs of producing power could decline enough for households to see lower bills.

### Contract Terms

Uncertainty over contract terms and agency rules to be set by SENER, CRE and CENACE in the months following approval of secondary laws poses another potential barrier, as these terms will ultimately factor into private

players' decision to invest in Mexico's electricity sector. One key factor will be which consumers qualify as "large industrial consumers" and can contract power independently from the wholesale market instead of through CFE. Although industry consumes more than half of the country's electricity, SENER's benchmarking system considers "large users" to account for less than a quarter of total electricity consumption.

State institutions will also be charged with setting a range of other policies, including the minimum level of national content in electricity projects and taxes levied on private companies. Establishing efficient procedures for environmental permitting and the timely resolution of right-of-way disputes in Mexico's courts will also be critical to ensure project feasibility.

### Infrastructure

Infrastructure must be expanded to avoid bottlenecks to rapidly increasing electricity generation. Reducing technical losses will require upgrading hundreds of thousands

of miles of the grid, a massive investment of several years that could cause temporary power outages. In addition, new transmission lines will have to be built to move power from new plants to consumers. Pipeline infrastructure will need to be expanded, both within Mexico and across the US border. Looking to ease the supply constraints driving up Mexico's natural gas prices, the government plans to import more gas from the United States and expand cross-border pipeline capacity from 8 billion cubic feet per day to 20.6 billion cubic feet per day in the coming decade. But most of these new pipelines are not expected to begin operating until 2018 or later.

### Government Institutions

The reform's success will rest in great part on the capabilities of electricity sector institutions. CRE and CENACE will require significant human and financial resources to efficiently process new permits, monitor activities, and enforce standards throughout the system. The rapid expansion of responsibilities will require sufficient funding from the central government and qualified professionals capable of performing highly technical analyses.

CFE will encounter greater competition from private firms in generation and commercialization. But as the sole supplier for residential, small commercial and agricultural users at subsidized rates determined by SHCP, it will likely continue to shoulder heavy financial obligations. The government will have to take steps to improve CFE's fiscal situation to allow it to compete effectively in the wholesale market and tackle other pressing issues in the sector, such as electricity theft.

### Natural Gas Production

The promise of lower electricity tariffs hinges in part on greater use of relatively cheap natural gas to replace oil-fired plants. But while the new hydrocarbons framework creates a more favorable environment for private investment in oil exploration and production, it is unclear whether the reform will lead to a significant increase in domestic gas production. Government officials are still in the process of determining what resources Pemex will retain in

the first upstream auction before new contract terms are unveiled, and the outcome of this process will determine investor interest in exploration and production contracts. Even under favorable investment conditions, however, it is unclear how much of Mexico's gas resources will be attractive to oil companies. Its shale gas resources are mainly concentrated in remote, water-poor areas with high security risks and are not believed to be liquids-rich, meaning profit margins would be lower. Moreover, the development of new fields will take a minimum of 5 to 10 years. This underlines the importance of moving ahead with imports from the United States to meet Mexico's growing natural gas deficit.

Looking to ease the supply constraints driving up Mexico's natural gas prices, the government plans to import more gas from the United States and expand cross-border pipeline capacity from 8 billion to 20.6 billion cubic feet per day.

### Renewable Energy

Mexico's new framework includes some measures that could boost renewable energy generation and help the country reach its non-binding target to produce 35% of electricity from clean energy sources by 2024, compared to 15% in 2012. Establishing an independent grid operator will remove the CFE's conflict of interest in encouraging renewable energy projects to connect to the grid, which compete with its own generation plants and provide intermittent energy, requiring CFE to dispatch back-up power. The CFE's ability to subcontract with private parties to build and operate transmission lines should also ease bottlenecks for renewable energy developers which often face long delays in connecting to the grid because of inadequate transmission capacity and resistance from the CFE.

However, some of the key concerns for renewable energy investors remain unaddressed. Mexico does not offer any major fiscal incentives for renewable energy, such as feed-in tariffs, and it is unclear how competitive renewables will be against natural gas. New laws oblige SENER to establish a scheme of clean energy certificates and emissions permits but stop short

of defining terms or benchmarks. And similar systems, such as the carbon tax levied by Mexico's Congress in October 2013, have been undermined by legal loopholes and poor implementation. A new law will increase private participation in geothermal energy, where Mexico already ranks as one of the world's top producers, but other renewable sources, like wind and solar, do not enjoy special support from the reform. The Peña Nieto administration, however, plans to introduce seven new "green laws," to Congress in July 2014, which could help boost investment in clean energies.

## Looking Ahead

Now that Mexico's government has won public support for the new electricity framework, policymakers must continue the public dialogue to sustain momentum for this critical endeavor. The new legislation opened the door for much-needed improvements in the electricity sector, but structural change will be a protracted process and the greatest benefits of power sector reform will materialize only over the course of a decade. Mexico's government should establish a more realistic timeline for change, set clear public expectations and work quickly to resolve uncertainties and hurdles to sustain the momentum that has driven support for the reform and ensure its long term success.

Despite the challenges, the reform's contribution to Mexico's development, if done right, will be immense. Creating an efficient, competitive electricity market can reduce the fiscal burden on CFE and the national government, improve operating costs for businesses, and boost competitiveness to fuel Mexico's economy.

## Bibliography

- Bailey, Jed (2013). "Mexico's Natural Gas and Electric Power Reform: First Impressions," *Energy Narrative*.
- Congreso General de México (2012). Ley general de cambio climático.
- García, Karol (2014). "En dos años bajarán las tarifas de gas y electricidad: Coldwell," *El Economista*.
- García, Karol (2014). "CFE construirá cinco gasoductos junto a la IP," *El Economista*.
- International Energy Agency (2014). International Energy Indicators.
- Mares, David R. (2013). *Shale Gas in Latin America: Opportunities and Challenges*. Inter-American Dialogue Energy Policy Group Working Paper.
- Presidencia de México (2014). "Preguntas y respuestas sobre la reforma energética."
- Presidencia de México (2014). Propuesta de legislación secundaria en materia energética, (1) Ley de hidrocarburos, (5) Ley de la industria eléctrica, (6) Ley de la energía geotérmica, y (10) Ley de la Comisión Federal de Electricidad.
- Secretaría de Economía de México (2014). Información estadística y arancelaria.
- Secretaría de Energía de México (2014). Sistema de información energética.
- Secretaría de Energía de México (2013). *Prospectiva del sector eléctrico 2013–2027*.
- Serra, Luis et al. (2013). *Luz a la competitividad nacional*. Centro de Investigación para el Desarrollo A.C. (CIDAC).
- Lujambio, José María et al. (2013) *Gestión de oferta y demanda de gas natural en México*. Centro de Investigación para el Desarrollo A.C. (CIDAC).
- United States Energy Information Administration (EIA) (2014). Mexico Country Notes.
- Viscidi, Lisa (2014). "Mexico Energy Reform Promises to Boost Renewables." Energy Intelligence Group.
- World Bank Group (2014). World Development Indicators.



## **Inter-American Dialogue Board of Directors**

**Ernesto Zedillo**, *Co-Chair*, Mexico

**Carla A. Hills**, *Co-Chair*, United States

**L. Enrique Garcia**, *Co-Vice Chair*, Bolivia

**Thomas F. McLarty III**, *Co-Vice Chair*, United States

**David de Ferranti**, *Treasurer*, United States

**Fernando Henrique Cardoso**, *Chair Emeritus*, Brazil

**Ricardo Lagos**, *Chair Emeritus*, Chile

**Enrique Iglesias**, *Vice Chair Emeritus*, Uruguay

**Alicia Bárcena**, Mexico

**Francis Fukuyama**, United States

**Donna J. Hrinak**, United States

**Marcos Jank**, Brazil

**Jim Kolbe**, United States

**Thomas J. Mackell, Jr.**, United States

**M. Peter McPherson**, United States

**Billie Miller**, Barbados

**Brian O'Neill**, United States

**Pierre Pettigrew**, Canada

**Marta Lucía Ramírez**, Colombia

**Arturo Sarukhan**, Mexico

**Eduardo Stein**, Guatemala

**Roberto Teixeira da Costa**, Brazil

**Martín Torrijos**, Panama



**Michael Shifter**

*President*



The Inter-American Dialogue is the leading US center for policy analysis, exchange, and communication on issues in Western Hemisphere affairs. The Dialogue brings together public and private leaders from across the Americas to address hemispheric problems and opportunities. Together they seek to build cooperation among Western Hemisphere nations and advance a regional agenda of democratic governance, social equity, and economic growth.

The Dialogue's select membership of 100 distinguished citizens from throughout the Americas includes political, business, academic, media, and other nongovernmental leaders. Sixteen Dialogue members served as presidents of their countries and more than three dozen have served at the cabinet level.

Dialogue activities are directed to generating new policy ideas and practical proposals for action, and getting these ideas and proposals to government and private decision makers. The Dialogue also offers diverse Latin American and Caribbean voices access to US policy discussions. Based in Washington, the Dialogue conducts its work throughout the hemisphere. A majority of our Board of Directors are from Latin American and Caribbean nations, as are more than half of the Dialogue's members and participants in our other leadership networks and task forces.

Since 1982—through successive Republican and Democratic administrations and many changes of leadership elsewhere in the hemisphere—the Dialogue has helped shape the agenda of issues and choices in inter-American relations.

**1211 Connecticut Avenue, NW, Suite 510  
Washington, DC 20036**

**PHONE: 202-822-9002 ■ FAX: 202-822-9553  
EMAIL: [iad@thedialogue.org](mailto:iad@thedialogue.org) ■ WEB SITE: [www.thedialogue.org](http://www.thedialogue.org)**