

RFF REPORT

Attaining Sustainable Development of Oil and Gas in North America

Appendix: Mexico Policy Briefs

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ATTAINING SUSTAINABLE DEVELOPMENT OF OIL AND GAS IN NORTH AMERICA

APPENDIX: MEXICO POLICY BRIEFS

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Introduction

The following set of policy descriptions was put together by researchers at the Centro Mario Molina as part of an international review of environmental policies governing oil and gas development in Canada, Mexico, and the United States. The policy briefs presented here cover Mexico, with the [United States](#) and [Canada](#) covered in companion appendices. The broader set is reflected in a summary report covering all three countries: [*Attaining Sustainable Development of Oil and Gas in North America: A Review of the Environmental Regulatory Landscape*](#).

This document includes brief descriptions of policies governing the oil and gas production process, from extraction (well-site permitting onward) to end use in the transportation and electricity sectors. Each description provides context, the current state of regulation and best practice, and commentary options for reform and, in some cases, harmonization.

Abbreviations of government agencies and organizations are for the entities' names in Spanish.

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National Agency for Industrial Security and Environmental Protection

Context

- Reforms to the Mexican Constitution in December 2012 provided the starting point for Mexico's ambitious energy reforms, opening oil and gas activities for the first time in decades to a larger participation by the private sector. These changes are currently being followed by a wave of secondary legislation initiatives that will complete the new institutional framework.
- The opening of the hydrocarbon sectors will imply a large expansion of infrastructure: new fields, both in water and on land, will bring new and additional industrial safety and environmental challenges. The previous integrated arrangement, with the state-owned firm closely working with the environmental agency and assuming most of the industrial safety policy tasks, will have to change.

Current Policy

- Through the transitory text of the 2012 Constitutional reforms, a new environmental and industrial safety agency was created, specifically for the regulation of hydrocarbon activities. The not-yet-launched Agencia Nacional de Seguridad Industrial y Protección del Medio Ambiente (ANSIPMA) would have a broad mandate; a bill now in Congress will define its attributes.
- The institutional design of the agency proposed by the executive branch is now under discussion in Congress. However, some of the proposed elements of the bill suggest serious risks of potential regulatory capture:
 1. Unipersonal position for the agency's head, instead of collegiate direction, the more common approach both in Mexico and elsewhere. Advisory and supervisory boards OK.
 2. Presidential designation and removal of the agency's director, with no overlap between administrations.
 3. Requirements of five years' working in related professional activities are in the right direction, but only one year of separation from incumbent firms is considered too short.
 4. The accountability and transparency requirements are vague; no report to Congress or the public is specified.

Commentary

- The current discussion in Congress should consider some changes to strengthen the agency's design against capture and increase democratic accountability, particularly introducing a collegiate executive direction that would overlap an administration's period.

- The ample mandate of the agency includes authorizations of operations in natural protected areas, standard setting, monitoring and enforcement of regulations, thus reducing the power of SEMARNAT, the institution in charge of these issues nationwide. Should its mandate be spread or shortened to have less capture on topics where interest groups are so narrowly focused?

Mexico's New Hydrocarbons Institutional Framework

Context

The recent constitutional reform of Articles 25, 27, and 28 opened the Mexican energy sector for the participation of the private sector in the activities of exploration and extraction of oil and natural gas, activities that were previously exclusive to Petr leos Mexicanos (Pemex). However, it preserves the stewardship and ownership of the state over Mexico's hydrocarbon resources. The new *Ley de Hidrocarburos* (LdH) expands the parameters of these constitutional articles into a full institutional setup for the hydrocarbon industry,² including mechanisms for allocation of contracts, information requirements, access to distribution networks, and the definition of new systems of administration.

Current Policy

Allocations

- The LdH regulates the figure of allocations to Pemex and other state-owned firms. The Ministry of Energy (SENER) can grant and amend these, given a "favorable opinion" from the National Hydrocarbons Commission (CNH). Pemex and other state enterprises may collaborate with private firms through service contracts for activities related to such allocations.

Exploration and Extraction Contracts

- The CNH, according to the guidelines established by SENER and the Ministry of Finance (SHCP), may establish contracts for exploration and extraction with Pemex, other state productive enterprises and private firms.
- Pemex and other productive state firms have the ability, if needed, to migrate their allocations toward contracts to form alliances or partnerships with private firms.

Information Obtained from Exploration and Extraction Activities

- All geological, geophysical, petrophysical, and petrochemical information obtained from the activities of surface exploration and extraction is considered national property (*propiedad de la naci n*). The CNH will establish and administer a national hydrocarbon information center.

² Specifically it regulates hydrocarbons exploration and production; treatment, refining, alienation, commercialization, transportation and storage; processing, compression, liquefaction, regasification and decompression, as well as transport, storage, distribution and public sales of natural gas; transport, storage, distribution and public sales of liquefied petroleum gases; transport, storage, distribution and public sales of oil products; and pipeline transport and storage linked to pipelines of petrochemicals.

Open Access

- Licensees that provide transport and distribution services by pipeline, storage of hydrocarbons, LPG, oil products, and petrochemicals are obliged to provide open access, subject to the availability of capacity in their systems.

Commentary

Mexico's ambitious hydrocarbon reform is expected to bring competition and increase capital investment, technology, and productivity in the sector, boosting economic growth over the short and long term. However, the increase in the number of actors and projects will make environmental regulation and monitoring more complex, posing significant risks for the environment if regulation, monitoring, and enforcement capacity does not increase at the same pace.

The LdH additionally regulates the following:

Exploration and Extraction Contracts

- The remuneration stated in the contracts will be subject to the provisions of the Revenue Act of Hydrocarbons.
- The Ministry of Energy (SENER) is responsible for the following:
 - Selecting areas
 - Approving and issuing the five-year plan of tenders
 - Establishing a recruitment model for each area to maximize national revenue
 - Designing the technical terms and conditions of each contract
- The Ministry of Finance (SHCP) is responsible for the following:
 - Establishing economic conditions on tax terms for tenders and contracts
 - Determining adjudication variables of the tender process
 - Performing administrative and accounting audits on the tax terms of contracts
- The National Hydrocarbon Commission (CNH) is responsible for the following:
 - Providing technical assistance to SENER
 - Performing tenders
 - Subscribing the contracts

Other Hydrocarbon Activities

- SENER will issue licenses for oil treatment and refining; natural gas process; hydrocarbon imports and exports; LPG transport and storage not linked to pipelines, distribution, and public sales; oil products; and petrochemicals.
- The Energy Regulatory Commission (CRE) will issue licenses for oil products and petrochemicals transport, storage, distribution, compression, liquefaction, decompression, regasification and public sales; LPG pipeline transport, storage linked to pipelines.

Public Sales

- Quality specifications will be established in the Mexican official norms (NOM) issued by CRE.
- Jet fuel cannot be sold directly; it will be controlled by ASA according to the terms of the Airports Act.

National Center for Control of Natural Gas (CENAGAS)

- CENAGAS is the independent operator of the system and is commissioned to ensure the continuity and security of gas supply in the country.

Integrated National Transport and Storage System of Natural Gas

- This system will integrate the following:
 - Transport pipelines and storage infrastructure of natural gas
 - Compression, liquefaction, decompression, and regasification equipment linked to the transport and storage of natural gas

Environmental Regulation for Shale Oil and Gas Extraction in Mexico

Context

- The US Energy Information Administration assessed 137 shale formations in 41 countries outside the United States. Mexico was ranked in sixth worldwide for shale gas reserves, with 545 trillion cubic feet, and eighth for shale oil reserves, with 13 billion barrels. [1]
- In its current energy planning stage, Mexico incorporated some of these formations for the exploration and production of unconventional reservoirs [2]. Petróleos Mexicanos (PEMEX) identified five geological provinces as precursors for shale oil and gas—Sabinas, Burros-Picachos, Burgos, Tampico-Misantla, and Veracruz—where an estimated 141.5 trillion cubic feet of natural gas and 31.9 billion condensed barrels are available. [3]

Current Policy

- Before the ambitious energy reforms of 2013–2014, only PEMEX could extract hydrocarbons in Mexico. Now, the sector has been opened to private sector participation, individually or in association with state-owned firms.
- There is not yet any specific regulation for environmental and industrial safety regarding shale oil and gas hydraulic fracturing, as the activities themselves are at an experimental or pilot stage in the diverse regions in the country. However, while specific regulation is being written, existing regulations and procedures, such as water quality standards or environmental impact assessments requirements, will allow federal agencies to ensure a basic coverage of most of the relevant aspects of the activity.

Commentary

A recent study by the Centro Mario Molina [4] identifies the following key points for action:

- There is a need for new regional plans for water availability and usage in the shale areas.
- Water pollution and wastewater management plans are needed, plus standards or guidelines to ensure the mechanical integrity of wells during their lifetime to avoid aquifer damage.
- The hydrocarbon sector regulator in environmental matters must design and implement a program to minimize flaring and venting, with a baseline for GHGs and criteria pollutants.
- Installing a seismic “traffic light” that provides feedback on the fracking procedures and the disposal of polluted subsurface waters.
- More transparency and participation mechanisms are needed to communicate risks and the actions taken to reduce it, with an emphasis on informing poorer stakeholders and neighboring or otherwise environmentally linked communities.

Hydrocarbon Extraction in Natural Protected Areas

Context

- Mexico is one of the five countries with highest biodiversity in the world. A signatory of the international Convention on Biological Diversity, the country has responded to its global responsibilities and to its citizens by declaring nearly 1 percent of its territory as natural protected area (NPA), with different degrees of protection and economic activities allowed.
- Because new sources of hydrocarbon wealth are found within NPAs, the interaction of both policy goals becomes complex and will likely not be resolved without friction or conflict. As private firms are expected to play a larger role in hydrocarbon extraction, transport, and processing, thanks to the energy reforms, these interactions will grow in complexity and tension over time, as they have done in mining activities.

Current Policy

- Mining operation authorizations require the involvement of at least a dozen federal agencies,³ of which, the Ministry of Economy (SE) gives extraction concessions, and the Ministry of the Environment (SEMARNAT) handles its environmental regulation. In contrast, NPAs are created by presidential decree and regulated through the General Law of Ecological Balance and Environmental Protection (LGEEPA), with little involvement of other agencies besides SEMARNAT and its NPA commission.
- Article 87 of the General Environmental Protection Law has a default prohibition on extraction of minerals in NPAs, overridden only if the NPA’s particular management plan allows it and if SEMARNAT grants special authorization. All mining activities within an NPA have to submit an environmental impact assessment to SEMARNAT to obtain authorization,

³ Ministry for Foreign Affairs, Ministry of Economy, Ministry of Finance and Public Credit, Ministry of Agrarian Development and Urban Territory, Ministry of Labor and Social Welfare, Ministry of Environmental Protection, Ministry of National Defense, Ministry of Energy, Water National Commission, Mexican Social Security Institute, National Commission for the Development of Indigenous Peoples, National Agrarian Registry and the Mexican Geological Service.

but the rules differ depending on whether the mineral wealth was discovered before or after the NPA was created:

- If the mineral concession existed before the NPA decree, the extraction and removal of minerals can be carried out, if permits are in order.
- If the mineral wealth is found after the NPA was created, extraction can be carried out only after a positive response in litigation is obtained, and with all the environmental regulations fulfilled. Some activities do not win the legal challenge.

Commentary

- ANSIPMA, the new environmental agency for hydrocarbons, will have SEMARNAT's attributes regarding authorizations within NPAs. Will the newly created ANSIPMA accelerate the process and provide certainty and sustainability to investment projects, or will stakeholders on either side of the spectrum capture it?

Environmental Impact Assessment (EIA)

Context

- Mexico relies heavily in its environmental impact assessment (EIA) procedure to grant construction and operation permits for large-scale projects, including mining and hydrocarbons.
- Mexico's EIA process also plays the function of covering any environmental issues not covered in the obligatory standards (Normas Oficiales Mexicanas, NOMs).
- The EIA review and authorization process is perceived as slow, with bottlenecks due to government's lack of personnel and technical expertise and some low-quality analysis by the private sector. Private firms complain about costly delays stemming from this.
- The EIA process has a public review period that has the objective of increasing transparency and governance.
 - However, it is perceived by civil society organizations as too short to inform the public properly.
 - The review also faces some contradictions between the general law and its derivative regulation regarding the timing and length of the process. Civil society organizations have gained injunctions on this basis.

Current Policy

- The general law (LGEEPA) distinguishes between activities that require EIAs submitted to the local authorities and those that should be submitted to the federal agency (SEMARNAT). Oil and gas fall in the latter category.
- SEMARNAT's Undersecretariat for Environmental Management has a "general direction" to direct the process.

- In the current prereform institutional context, PEMEX is an active player in developing and thoroughly reviewing EIAs internally, with few delays. Its compensation measures are considered up to global standards. (External independent reviews are needed to verify the claim).
- Private sector tourism, energy, and mining face the most frequent problems, regarding both technical and public review issues. The public reviews do not generally achieve the aims of gaining support and delivering feedback from stakeholders. (This assertion also requires verification.)
- The president presented, as part of the energy reform, an initiative creating a new, specialized institution for the hydrocarbon activities, ANSIPMA. The proposed agency would, among other things, assume the tasks of EIA review and authorization for oil and gas activities. In principle, a more specialized body for the regulation of the hydrocarbon activities could make the process more efficient. However, given the institutional design of the ANSIPMA currently under debate, it is not clear how the EIA process will evolve.

Commentary

To address the current structural bottleneck and prevent it from worsening when the energy reforms open more activities to private firms, some options can be considered:

- More funding, directly and/or through the creation of the new hydrocarbon environmental agency.
- Lighter workload, allowing for regional EIAs that cover a certain level of activities, to which private firms join, with a lesser burden of analysis and reporting requirements.
- Clarification of federal/local matters and public review requirements. Less conflict would create fewer delays.
- Requirements for the qualifications of EIA consultants.

Environmental Operation Licensing and Reporting

Context

- The Environmental Operation License (LAU) emerged as a response to industry groups' request to consolidate various environmental permits into a single process. It also helped make comparable the pollution inventories of NAFTA partners: the United States' Toxic Release Inventory (TRI), Canada's National Pollutant Release Inventory (NPRI), and Mexico's Pollutant Release and Transfer Registry (RETC).
- The LAU applies to air emissions from stationary sources under federal jurisdiction⁴ (Article 111bis of LGEEPA), which includes oil and gas activities.⁵ The license is issued once and is permanent, but it must be updated if the facility changes its process or production rates.

⁴ The fixed sources under federal jurisdiction are installations operating in the following sectors: chemical, petroleum and petrochemicals, paints and inks, automotive, pulp and paper, metallurgical, glass, electric power generation, asbestos, cement and lime and treatment of hazardous waste and electricity generation industries.

- One condition of the license is submission of a mandatory annual operation report (COA). The COA covers production, inputs for production, criteria pollutants and their precursors, wastewater discharges, and generation and management of hazardous waste. Additionally, under the pollutant release and transfer section of the COA, installations must report on hazardous air pollutants (HAPs), ozone-depleting substances (ODS), and greenhouse gases (GHGs).

Current Policy

- Many COAs are incomplete because the use of estimation methods is not well disseminated and/or enforced; typical problems in the reports include missing estimations for fugitive emissions and other nonregulated emissions.
 - In most cases, fugitive emissions are not declared in the reports for lack of knowledge and diffusion of estimation techniques. Additionally, although recommended in the manual for reporting, the reporting of fugitive emissions is not explicitly required in the current legislation.
- It is not explicitly defined whether the application to obtain the LAU should start before the construction process or once the operation starts.
- Because of the lack of specific regulation for the oil and gas sector, some of the requirements of a LAU are not applicable for some installations; for example, installations without combustion systems are asked for compliance with the standard on air emission limits for boilers.
- In the oil and gas sector there is no clear delimitation of the limits of installation—that is, systems and subsystems. Some subsystems may not require an LAU because they have associated no emissions or other environmental impacts. This is especially relevant in the oil sector: if the systems and subsystems of an installation were explicitly regulated, fewer LAUs would be required, and regulatory costs would also decrease.

Commentary

To increase the quality and quantity of the data reported in COAs, some options can be considered:

- Modify and explicitly regulate in which part of the process an LAU is required, and what are the limits of the installation.
- Introduce sanctions for failure to provide information and sanctions for repeated erroneous information.
- Harmonize current regulation (NOMs) on the hydrocarbon sector in Mexico with international standards.
- Introduce an explicit section on fugitive emissions and enforce its publication in the industries needed.

⁵ The LAU format also requests information related with fresh water supply sources, wastewater discharges and hazardous waste generation, management and disposal.

Opening of Electric Power Activities to Private Firms

Context

- The Mexican Constitution made electric power generation, transformation, transmission, and distribution the exclusive activities of state-owned firms. In 2013, unprecedented reforms to Articles 25, 27 and 28 of the constitution opened up these activities to the private sector. The specific rules and the new roles are still to be defined by separate bills, currently under discussion by the Mexican Congress and Senate, but a new institutional framework is clearly emerging.

Current Policy

- Planning and operation of the National Electricity System (SEN) would be under the operational control of an independent decentralized public institution: the Centro Nacional de Control de Energía (CENACE), which would also control and operate the wholesale electric market.
- Regulation of power generation would involve several institutions.
 - All types of power generation are open to public and private firms, and the associations they may form, except for nuclear power, whose generation would remain with state-owned firms.
 - The Energy Regulatory Commission (CRE) would be responsible for regulating and granting power generation permits to participating public and private firms.
 - CENACE would work to ensure competition conditions for private and public generators—for example, by forcing the separation of generation firms from operation ones.
 - National electric coverage to consumers would still be the direct responsibility of CFE; however, the state firm could be “supported” by private firms on these tasks. The specific way this subsidiary participation would take is still debated.
- Transmission and distribution
 - Electric power transmission and distribution is the responsibility of the government: there are no concessions in these activities. Networks are managed, operated and owned by CFE.
 - CRE establishes the transmission and distribution fees and guarantees open access to networks for all generators.
 - SENER determines the expansion needs of the SEN and selects the agent (CFE or privates) to execute them, according to criteria that would include environmental aspects.
 - CFE can contract with private firms to finance, install, maintain, operate, and expand the actual infrastructure to supply the public service (through public-private partnership models and similar schemes).
- Fees and trading

- The Ministry of Finance (SHCP), with the participation of the Ministry of Energy (SENER) and the Ministry of Economy (SE), regulates and establishes the fees charged to end users.
- According to their consumption, end users will be classified as either qualified or basic supply users. CFE will provide the basic supply users' electricity under regulated fees.
- Qualified users, on the other hand can buy energy directly from the wholesale electricity market or from independent suppliers. In this case they are free to negotiate prices and terms between parties to the transaction.

Commentary

The ambitious energy reform in Mexico is expected to bring competition and competitiveness into the generation of electric power in Mexico. It would allow a faster and more efficient expansion of transmission and distribution networks, and will offer the consumers a wider range of voltage and quantities of electric power at more competitive prices.

Fuel Efficiency Standards for Vehicles in Mexico

Context

- In Mexico, 20.4 percent of total greenhouse gas emissions—nearly 145 million tons of carbon dioxide equivalent (CO₂e) each year—is produced by the transport sector [5].

Current Policy

- Mexico has no fuel efficiency standards for heavy vehicles. President Peña Nieto's administration was expected to present a regulation package to harmonize regulations with Canada and the United States, but the process is stalled.
- New light vehicles must now comply with the official standard NOM-163-SEMARNAT-SENER-2013-SCFI. This official standard establishes corporate goals regarding the reduction of CO₂ emissions and equivalent gases for vehicles weighing less than 3,857 kg. These goals are reflected in the average fuel efficiency (fuel average performance) (km/l) per fleet of cars produced. The target is to achieve an average fleet efficiency of 14.9 km/l by the year 2016.
 - The rule provides incentives (banking credits, etc.) to improve compliance.
 - The Federal Attorney's Office for Environmental Protection will monitor vehicle production and apply sanctions.
- From 2013 to 2032, the regulation is expected to reduce gasoline consumption by 112.8 billion liters, thereby avoiding 265 million tons of HC, CO₂, and CO emissions, plus 546,000 tons of NO_x and 88,000 tons of SO₂. The expected benefits in health and averted deaths are valued at 26,818 million pesos [5].

Commentary

- For light vehicles, one option for reform is to create “feebates,” charging those who pollute above the limit and subsidizing those below the limit. This would favor cleaner technologies and create incentives for development.
- Lowering the cost of technological development would lower barriers to innovation and create incentives.
- Introducing financial incentives in banking markets could help close the gap between clean and dirty vehicle technologies.

Sources

- [1] US Energy Information Administration. (2013). Technically Recoverable Shale Oil and Shale Gas Resources: An assessment of 137 Shale Formations in 41 Countries outside the United States. Washington, DC: EIA.
- [2] Government of Mexico. (2013). National Development Plan 2013-2018.
- [3] Secretaría de Energía. (2013). Estrategía Nacional de Energía 2013-2027. México: SENER.
- [4] Centro Mario Molina. (2013). Sustainable Production of Shale Oil and Gas in Mexico.
- [5] Diario Oficial de la Federación. (2013). NORMA Oficial Mexicana NOM-163-SEMARNAT-ENER-SCFI-2013, emissions of carbon dioxide (CO₂) generated by the exhaust and its equivalence in terms of fuel efficiency, applicable to new motor vehicles of gross vehicle weight of up to 3 857 kg.