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Foreword

Mexico is one of the major gas producing countries in the world but in recent years the country's positon in this sector has weakened with national gas output declining and imports growing. This prompted the Mexican government to take action with a view to encouraging the modernisation and expansion of oil and gas pipelines and storage. In 2013, the government enacted an energy reform bill with the goal of liberalising energy markets and ensuring greater private investment. The key principles of the reform included reaffirming state ownership over subsoil resources, guaranteeing free competition among economic actors in the sector, strengthening regulatory agencies, and focusing on transparency and accountability in new contracts. However, the 2013 reform has proven controversial, generating ongoing debates about its potential impact on the energy industry in the medium and long term, the relevance of international and private investment in the country's industry, and the overall effects on Mexican consumers.

Against this background, the Mexican government asked the OECD to carry out an independent policy assessment to identify rules and regulations that may hinder the competitive and efficient functioning of markets in the Mexican gas sector. This competition assessment took place between October 2017 and October 2018 and follows on from an OECD competition assessment of the medicines and meat sectors which was published in 2018.

The gas sector competition assessment involved identifying and evaluating market regulations along the vertical supply chains, covering:

- Natural gas and its extraction, processing, transportation, distribution to final consumers, and manufacturing of basic petrochemical products from natural gas
- Liquefied petroleum gas (LPG) and its extraction, processing, storage, transportation and distribution to final consumers.

The OECD analysed 279 pieces of sector-relevant federal legislation and made 72 recommendations on specific legal provisions that should be abolished or amended. Most of the recommendations, such as increasing supervision of municipalities building new natural gas pipelines or opening up the market for supermarkets and gas stations to sell liquid petroleum gas (LPG) cylinders, are technical in nature and could be implemented independently of the Energy Reform 2013.

If all these recommendations are implemented in full, they will generate significant benefits for the Mexican economy in terms of long-term positive economic effects on productivity and growth. The OECD calculates that, even if only a small number of these recommendations are implemented at the midstream and downstream levels, this would have an annual positive effect for the Mexican economy between MXN 2182.8 million and MXN 3740.3 million. This amount, of course, could be much larger if full implementation is achieved.

This report provides the new Mexican government with detailed policy options to help mitigate or eliminate regulatory barriers, including those that: restrict entry into a market (e.g. municipal permits); constrain firms' ability to compete (e.g. by regulating prices); restrict firms' ability to choose suppliers (e.g. through requirements to buy national content); treat competitors differently (e.g. through asymmetrical regulation); facilitate co-ordination among competitors; or restrict consumers' ability to compare offers. These are necessary steps towards designing, developing and delivering a more competitive energy sector for the benefit of the Mexican economy and for Mexican consumers.

Greg Medcraft

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Abbreviations and acronyms

AAGR	Average annual growth rate
ADG	Association of LPG Distributors (*Asociación de Distribuidores de Gas LP*)
ADIGAS	LPG Inland Distributors Association (*Asociación de Distribuidores de gas LP del Interior*)
AMEXGAS	Mexican Association of LPG Distributors (*Asociación Mexicana de Distribuidores de Gas LP y Empresas Conexas*)
AMEXHI	Mexican Association of Hydrocarbons Companies (*Asociación Mexicana de Empresas de Hidrocarburos*)
AMGN	Mexican Natural Gas Association (*Asociación Mexicana de Gas Natural*)
ASEA	Agency for Safety, Energy and Environment (*Agencia de Seguridad, Energía y Ambiente*)
BOE	Barrels of oil equivalent
CENACE	National Centre for Control of Energy (*Centro Nacional de Control de Energía*)
CENAGAS	National Centre for Control of Natural Gas (*Centro Nacional de Control del Gas Natural*)
CFE	Federal Electricity Commission (*Comisión Federal de Electricidad)*
CNH	National Hydrocarbons Commission (*Comisión Nacional de Hidrocarburos*)
COFECE	Federal Economic Competition Commission (*Comisión Federal de Competencia Económica*)
CPEUM	Mexican Constitution (*Constitución Política de los Estados Unidos Mexicanos*)
CRE	Energy Regulatory Commission (*Comisión Reguladora de Energía*)
DACG	General Administrative Provisions (*Disposiciones Administrativas de Carácter General*)
DOF	Federal Official Gazette (*Diario Oficial de la Federación*)
EIA	US Energy Information Administration
FOB	Free on board
IEA	International Energy Agency
IMP	Mexican Petroleum Institute (*Instituto Mexicano del Petróleo*)
INEGI	National Institute of Statistics and Geography (*Instituto Nacional de Estadística y Geografía*)
IPGN	National reference index of wholesale natural-gas prices (*Índice de Referencia Nacional de Precios de Gas Natural al Mayoreo*)
kg	Kilogrammes
LNG	Liquified natural gas
LPG	Liquefied petroleum gas
Mcfpd	Million cubic feet per day
MFP	Multi-factor productivity
MWh	Megawatt hour
MXN	Mexican pesos

NAFTA	North American Free Trade Agreement
NG	Natural gas
NGL	Natural gas liquids
NMX	Mexican Standards (*Normas Mexicanas*)
NOM	Mexican Official Standards (*Normas Oficiales Mexicanas*)
ODAC	Co-ordinated Assistance Office for the Energy Sector (*Oficina de Asistencia Coordinada del Sector Energético*)
PCC	Gas release programme (*programa de cesión de contratos*)
PEMEX	Petróleos Mexicanos
PEP	PEMEX Exploration and Production (*PEMEX Exploración y Producción*)
PROFECO	Federal Attorney's Office of Consumer (*Procuraduría Federal del Consumidor*)
PEMEX TRI	PEMEX Industrial Transformation (*PEMEX Transformación Industrial*)
PMR	Product Market Regulation
PPP	Purchasing power parity
SASISOPA	Management Systems for Industrial and Operational Safety and Environmental Protection (*Sistema de Administración de Seguridad Industrial, Seguridad Operativa y Protección al Medio Ambiente*)
SE	Ministry of Economy (*Secretaría de Economía*)
SEDATU	Ministry of Agrarian, Territorial and Urban Development (*Secretaría de Desarrollo Agrario, Territorial y Urbano*)
SEGOB	Ministry of Interior (*Secretaría de Gobernación*)
SEMARNAT	Ministry of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*)
SENER	Ministry of Energy (*Secretaría de Energía*)
SHCP	Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público*)
SIAVI	Online Tariff Information System (*Sistema de Información Arancelaria Vía Internet*)
SISTRANGAS	Integrated Natural Gas Transportation and Storage System (*Sistema de Transporte y Almacenamiento Nacional Integrado de Gas Natural*)
SNG	National Gas Pipeline System (*Sistema Nacional de Gasoductos*)
SPE	State productive enterprise (*Empresa productiva del estado*)
Tbpd	Thousand barrels per day
TCPS	Terms and Conditions for the Provision of Services (*Términos y Condiciones para la Prestación de los Servicios*)
TJ	Terajoule
Tmt	Thousand metric tonnes
TX	Texas
USD	United States dollars
VPM	First-hand sales (*ventas de primera mano*)

Executive summary

The OECD was asked by the Mexican government to carry out an independent policy assessment to identify rules and regulations that may hinder the competitive and efficient functioning of markets in the Mexican gas sector. This Competition Assessment on gas took place between October 2017 and October 2018; it was the follow-on project to the first Mexican *Competition Assessment Review*, which evaluated regulations in the medicines and meat sectors and whose final report was presented by the OECD Secretary General in January 2018. For gas, the project team identified and evaluated market regulations along the vertical supply chains in the sector, covering:

- Natural gas and its extraction, processing, transportation, distribution to final consumers, and manufacturing of basic petrochemical products from natural gas.
- Liquefied petroleum gas (LPG) and its extraction, processing, storage, transportation and distribution to final consumers.

The project has proceeded in five stages. Stage 1 defined the exact scope of the natural-gas and LPG sector and saw a list drawn up of the 279 pieces of sector-relevant federal legislation. In Stage 2, this legislation was screened using the OECD's *Competition Assessment Toolkit* to identify potential competition barriers and 105 prima facie restrictions of competition were identified. Additionally, an economic overview of the Mexican gas sector was prepared that contained important economic indicators such as output, foreign trade and price trends. In Stage 3, the policymaker's objective for each provision was investigated. An in-depth analysis was carried out qualitatively and, whenever permitted by availability of data, quantitatively. In order to reach a better understanding of lawmakers' motivations and objectives, a number of meetings were held with officials from the relevant authorities, as well as with representatives of private associations. In Stage 4, draft recommendations for those provisions found to restrict competition were developed, taking into account similar provisions in comparable territories, notably EU countries and the United States. These preliminary recommendations were presented in a workshop on 16 July 2018 and then distributed for comments to the relevant Mexican authorities active in the gas sector: the Ministry of Energy (*Secretaría de Energía, SENER*); the Energy Regulatory Commission (Comisión Reguladora de Energía, CRE); the National Centre for Control of Natural Gas (*Centro Nacional de Control del Gas Natural, CENAGAS*); the Agency for Safety, Energy and Environment (*Agencia de Seguridad, Energía y Ambiente, ASEA*); and the National Hydrocarbons Commission (*Comisión Nacional de Hidrocarburos, CNH*). In the final stage, recommendations were finalised taking into account the comments made by the authorities. Additionally, during the project, the OECD team organised two workshops with officials from relevant authorities to build competition-assessment capabilities in the Mexican administration and to discuss preliminary recommendations.

As a result of this work, the report makes 72 recommendations on specific legal provisions that should be abolished or amended. The recommendations support the Mexican government's 2013 Mexican energy reform, which aimed to liberalise the energy markets and ensure greater private investment.

The main recommendations for the upstream (exploration, production), midstream (transport and storage) and downstream (distribution and retail) gas sector are summarised below.

Upstream

Since its 2013 energy reform, the Mexican government has held two main rounds of tenders during which areas containing gas have been allocated to private companies for production. Not all areas were successfully tendered, however, and industry participants have complained that certain post-tender conditions might reduce or delay production. The OECD makes the following recommendations to facilitate production at the upstream level.

- Allow private companies active in exploration and extraction to select their suppliers freely instead of obliging them to hold tender procedures when the contract passes above certain financial thresholds; a tender might not always be the most efficient way for a private company to choose a supplier. Companies should, however, have to report all their subcontracting to CNH to help it detect and prevent collusive agreements.
- Standardise the preconditions that CNH requires private companies and state productive enterprises to fulfil in order to participate in tenders for contracts (such as financial or technical conditions). Furthermore, introduce a registry for pre-qualified tender participants to avoid companies having to prove compliance with the same requirements more than once. This should regularly be verified that companies still comply with conditions.
- When choosing farmout partners, allow SPEs (including PEMEX) to decide when to start a tender procedure and how run the process; it should, however, be supervised by CNH.
- Study the possibility of regulating access to PEMEX's natural-gas processing facilities for a limited time period and giving gas exploration companies a right to have their gas processed in PEMEX facilities under fair and non-discriminatory conditions.
- Make the Mexican government aware that requiring companies to use national content will make natural-gas exploration and production more expensive and that the obligation to use national-content clauses should be accompanied by knowledge transfer, so that local companies become more competitive both in the Mexican and the international markets. Clarify the methodology for companies to easily calculate and measure the national content they must use during the exploration and extraction of hydrocarbons.
- Grant sufficient resources to SENER's General Directorate of Social Impact and Surface Occupation that it is able to issue social-impact studies within shorter time frames.
- Harmonise those Mexican Official Standards (Normas Oficiales Mexicanas, NOMs) in the gas sector that state that they are not in line with current international standards.

Midstream

The OECD makes the following recommendations to facilitate production at the midstream level.

- Establish a department within a federal agency to facilitate midstream and downstream business for natural-gas and LPG companies at a municipal level and help them obtain municipal permits more easily. This department would work within the limits of Article 115 of the Mexican Constitution and respect municipalities' autonomy. Its tasks might include suggesting models of permit applications (*modelos de solicitudes de permiso*) to municipal authorities; signing collaboration agreements (*convenios de colaboración*) with municipal authorities or states; advising applicants on how to best deal with municipal authorities; publishing an annual report about the situation of LPG companies at the local level; holding capacity-building workshops with municipal officials; and acting as amicus curiae in legal cases about municipal permits that have been unfairly denied.
- Study the possibility of granting municipalities incentives (e.g. regular payments, contributions to infrastructure building) for natural gas sold in or transported across their territories to motivate them to support the construction of new natural-gas pipelines; this could help natural-gas companies better compete for end customers.
- The 2013 energy reform changed the legal status of PEMEX and established "asymmetrical regulation", meaning that the former state monopoly is subjected to greater regulatory restraint than other participants in the gas industry for such a time as deemed necessary to rebalance its dominant market position. CRE should publish regular (for example, annual) reports about the status of all upstream and midstream markets in which PEMEX is subject to asymmetrical regulation. In these reports, CRE should explain the criteria on which its evaluation is based for each market and the changes still needed for asymmetrical regulation to be lifted.
- Establish that final decisions on compensation for any land used for the construction of new natural-gas pipelines should be made by government authorities. Grant a federal authority the power to set compensation for landowners on whose land a natural-gas pipeline is to be built rather than it being determined in bilateral negotiations.
- Establish that an authorisation instead of a rejection should be granted by default (*afirmativa ficta*) if a request for a change of land use for the construction of a natural-gas pipeline is not answered within the established timeframe and if the timeframe was not interrupted, because, for example, the application was incomplete and did not include all the required facts. In cases where an authorisation granted by default leads to unforeseen negative (e.g. environmental) consequences, SEMARNAT should be able to challenge or withdraw the authorisation within a limited time period.
- Allow notaries (in addition to local judges) to validate contracts between gas companies and landowners.
- Eliminate the duty of gas companies to report the same set of facts to two authorities. For example, negotiations between gas companies and owners of land currently need to be reported both to SENER or SEDATU, while accidents linked to natural gas must be reported to ASEA and CRE.

Downstream

The OECD makes the following recommendations to facilitate production at the downstream level.

- Increase competition between distributors of LPG cylinders. Specifically, issue regulations for the exchange of branded cylinders; standard deposits for exchanges; the creation of cylinder-exchange centres; requiring distributors of branded cylinders to accept competitors' branded cylinders; and preventing distributors of branded cylinders from holding competitors' cylinders.
- Introduce a tool that enables residential consumers to compare the aggregated prices of LPG and natural gas in their area in order to increase competition between the two types of gas.
- Reassess safety conditions for partial filling of cylinders (known as *pigteleo*).
- Introduce a one-stop shop (*ventanilla única*) for companies for procedures such as applying for permits and authorisations related to ASEA, CRE and CNH, and possibly also SENER and SAT.
- Require CRE to publish an annual report with statistics on the average time needed to issue different types of permits.
- Issue guidelines for determining the duration of LPG and natural-gas-related permits (i.e. for transport, storage, distribution, commercialisation and sales to the public) depending on the specific activity in order to give more transparency to market participants.
- Issue a NOM that deals specifically with the verification of the net content of LPG cylinders by PROFECO.
- Issue guidelines for co-ordinated inspection visits by CRE and ASEA, and establish an interagency body between CRE and ASEA to help co-ordinate visits.

Chapter 1. Assessment and recommendations

This assessment identifies distortions to competition in Mexican federal legislation and proposes recommendations for removing regulatory barriers to competition in the gas sector of the Mexican economy, including natural gas and liquid petroleum gas (LPG) and the vertical chain of production for gas (exploration, production, processing, transport, wholesale, retail). It identifies and analyses 105 potential regulatory restrictions, and makes 72 specific recommendations to remove potential barriers and increase competition. Benefits from increased competition will include lower prices, and greater choice and variety for consumers. This report identifies the sources of those benefits and, where possible, provides quantitative estimates.

The Mexican Competition Assessment of Laws and Regulations in the Gas Sector is the follow-on project to the first *Competition Assessment Review* for Mexico, which evaluated regulation in the medicine and meat sectors. That final report was presented by the OECD Secretary General in January 2018 (OECD, 2018). This new project has identified and evaluated market regulations along the vertical supply chains in the gas sector, covering natural gas and its extraction, processing, transportation, distribution to final consumers, and manufacturing of basic petrochemical products from natural gas, as well as liquefied petroleum gas (LPG) and its extraction, processing, storage, transportation and distribution to final consumers.

In December 2013, the Mexican government enacted an energy reform with the goal of liberalising the energy markets and ensuring greater private investment. The key principles of the reform included reaffirming state ownership over subsoil resources, guaranteeing free competition among economic actors in the sector, strengthening regulatory agencies, and focusing on transparency and accountability in new contracts. The energy reform included Petróleos Mexicanos (PEMEX), the state-owned monopoly for natural gas and LPG production, becoming an SPE – a 100% state-owned enterprise with the objective of creating economic value – that enjoys far-reaching technical, management and budgetary autonomy.

This work aims at identifying regulatory barriers that restrict entry into a market (such as municipal permits); constrain firms' ability to compete (for example, by regulating prices); restrict their ability to choose their suppliers (for example, through requirement to buy national content); treat competitors differently (such as through asymmetrical regulation); facilitate co-ordination among competitors; or restrict consumers' ability to compare offers. The methodology followed in this exercise is summarised in Annex A, which also provides full references to the OECD Competition Assessment methodology.

1.1. Market regulation and competition

The Mexican Competition Assessment project in the gas sector, with its focus on natural gas and LPG, has the goal of removing regulatory barriers and introducing more competition to the sector.

One of the main reasons to pursue pro-competitive regulatory reforms is to benefit the Mexican national economy. Customers benefit when they can choose between different providers of goods, as does the economy as a whole, and their ability to choose forces firms to compete with each other. Choice and variety for consumers is seen as a good thing in itself, but, more importantly, firms that operate in competitive markets experience faster productivity growth than firms in less competitive environments.

The conclusion that increased competition generates high productivity is supported by detailed studies of industries and individual firms. For example, Nickell (1996) states that evidence suggests that "competition, as measured by increased numbers of competitors or by lower levels of rents, is associated with a significantly higher rate of total factor productivity growth". Building upon and deepening Nickell's work, Disney, Haskel and Heden (2003) use data on 140 000 separate UK businesses and conclude that "market competition significantly raises both the level and growth of productivity". Blundell, Griffith and van Reenen (1999) examined a set of data on manufacturing firms in the United Kingdom and found product market competition had a positive effect on productivity growth. A wide variety of empirical studies, as summarised in OECD (2014), confirms that industries in which there is greater competition experience faster productivity growth.

Other benefits from competition include lower consumer prices, greater consumer choice and better quality of products and services, higher employment, greater investment in R&D, and faster adoption of innovation.

In addition to this evidence of competition promoting growth are studies of the effects of product market deregulation, the most relevant area for this project. Arnold, Nicoletti and Scarpetta (2011) studied firm-level data in ten countries from 1998 to 2004, conducting the analysis using the OECD's Product Market Regulation (PMR) index at industry-level. The authors found that more stringent product market regulation reduces firms' multifactor productivity (MFP). This result also holds at the aggregate level (Égert, 2016). In a study of 15 countries and 20 sectors, from 1985 to 2007, Bourlès et al. (2013) estimate the effect of regulation of upstream service sectors on productivity growth downstream. They find that anti-competitive regulations have an impact that goes beyond the sector in which they are applied, and that this effect is more important for the sectors closer to the productivity frontier.

Innovation and investment in knowledge-based capital (KBC), such as computerised information, intellectual property rights (IPRs) and economic competencies, are also negatively affected by stricter PMR (Andrews and Criscuolo, 2013; Andrews and Westmore, 2014). For instance, PMR affects innovative efforts, as higher firm entry rates can increase new ideas and put pressure on incumbents to innovate. In addition, it influences innovation because it enables innovative firms to combine the resources needed to market new ideas and products more efficiently. The 2013 paper notes that "a policy reform that would alleviate regulatory barriers in business services from the OECD average (i.e. France) to the low level in Sweden is associated with a 30% increase in investment in innovative firms".

Lifting barriers also enables innovative firms to combine more efficiently the resources needed to market new ideas and products. Pro-competition reforms to product market regulation are associated with an increase in the number of patents (Westmore, 2013).

Another benefit of greater regulatory flexibility in PMR is higher employment. A recent OECD study (Criscuolo et al., 2014) finds that across 18 countries over a ten-year period, small firms that are five years old or under on average contribute to about 42% of job creation. As noted by the OECD (OECD, 2015), "such a disproportionally large role by young firms in job creation suggests that reducing barriers to entrepreneurship can contribute significantly to income equality via employment effects". Using the OECD's summary index of product market regulation in seven non-manufacturing industries, covering energy, telecom and transport sectors, Causa, de Serres and Ruiz (2015) find a negative impact of stringent product market regulation on household disposable income. This result holds both on average and across the income distribution, and leads to greater inequality. The authors note that lower regulatory barriers to competition would "tend to boost household incomes and reduce income inequality, pointing to potential policy synergies between efficiency and equity objectives".

Further OECD work (Ennis and Kim, 2017) investigates the relationship between competition and inequality. The authors calibrate a model to assess the redistributive effects of market power in eight countries and find that it benefits the wealthiest households. In their model, the share of wealth of the top 10% of households deriving from market power may lie between 10% and 24%. Introducing more competition into a sector will therefore proportionally benefit poorer households.

1.2. Key findings from the Competition Assessment project in Mexico

The main aim of this latest stage in Mexican Competition Assessment project is to investigate how to improve competition in the gas sector of the Mexican economy through the removal of regulatory barriers.

The outcomes discussed in this section were reached by identifying regulatory barriers to competition, assessing their impact in terms of harm to competition, and suggesting specific recommendations to lift the restrictions. This is not an economic-impact assessment; rather, it is a methodical analysis of the legislative texts related to the sectors under analysis.

The work has led to the identification of 105 regulatory restrictions in the 279 legal texts selected for assessment. In total, the report makes **72 specific recommendations** to mitigate harm to competition. These can be consulted in Annex B.

Table 1.1. Legal provisions analysed and recommendations made up-, mid- and downstream

	Upstream	Midstream	Downstream	Total
Prima facie restrictions found	31	26	48	105
Recommendations made	20	17	35	72

Source: OECD analysis.

1.3. Main restrictions identified and recommendations

The restrictions are briefly summarised below, as are the main recommendations for the upstream, midstream and downstream gas sector.

1.3.1. Upstream

The upstream gas sector comprises exploration and production, as well as processing of gas. In the sector, the OECD recommends a number of measures to facilitate production of natural gas. These may lead to foreign gas being substituted by Mexican production, and so a reduction in imports and a boost to national production. This may also increase investment into the national infrastructure with possible long-term benefits. Details are given in Annex 2.A1.

1.3.1.1. Procurement

- **Requirement for private companies to hold tender procedures.** For the exploration and extraction of hydrocarbons in Mexican territory, the federal government can either use an assignment, granting the exclusive right to carry out exploration and extraction activities within a defined area for a determined duration to PEMEX or other state productive enterprises (SPEs), or award contracts for hydrocarbon production rights to private companies or SPEs. If an assignee or a contractor subcontracts or makes acquisitions for amounts lower than USD 5 million, the assignee or contractor can use any selection procedure it chooses. If the amount is between USD 5 million and USD 20 million, however, the assignee or contractor must choose its provider using the "restricted invitation procedure" in which at least three companies are invited to submit offers and the contract is awarded to the best in terms of quality and price. Finally, for amounts over USD 20 million, the assignee or contractor must run a tender procedure. These thresholds apply to both private companies and SPEs. This despite a tender not necessarily being the most efficient way for a private company to choose a supplier.

The provision might increase their costs for private companies as they are forced to run tender procedures even for comparatively small amounts. Also, private companies are limited in their freedom to choose suppliers. The OECD recommends that private companies should be able to select their suppliers freely. They should also have to report all their subcontracting to the National Hydrocarbons Commission (Comisión Nacional de Hidrocarburos, CNH) to help detect and prevent collusive agreements between companies that initially competed in the contract tender process (or did not participate due to an agreement). Additionally, the OECD recommends adding a clause to all calls for tenders to require companies to reveal any intention to subcontract and then report any subsequent subcontracting, as well as the selection criteria.

- **Pre-conditions for participating in tenders.** In order to participate in tender procedures for contracts for the exploration and extraction of hydrocarbons, SPEs and private companies must fulfil certain preconditions for CNH (for example, financial or technical conditions); these are usually established in the calls for tender. A company wanting to participate in a tender needs to pre-qualify for each tender even if it participated the same year in a tender that had the same or even stricter requirements. Several market participants have claimed that preconditions for participating in tenders can be excessive and might increase participation costs. The OECD recommends as much as possible standardising preconditions that private companies and SPEs are required to fulfil in order to participate in tenders for contracts of CNH. These standard conditions can then be modified, if necessary, on a case-by-case basis. Furthermore, the OECD suggests introducing a registry for pre-qualified tender participants to avoid private companies or SPEs having to prove compliance with the same requirements more than once. Conditions should, however, be regularily verified (for example, every five years) to ensure that the company in question still complies with all of them.

1.3.1.2. Preference for Mexican goods and services

- **Requirement for assignees and contractors at upstream level to buy a minimum of national content.** The 2013 energy reform establishes that to promote the participation of national enterprises at all levels of the energy-sector value chain, a minimum percentage of national content should be used, including in the exploration and extraction phase. Assignees and contractors have to use a mandatory minimum percentage of national content of 25% (including Mexican goods and services, qualified Mexican labour, training of Mexican labour) in 2015; this is foreseen to gradually increase to at least 35% by 2025. The Mexican government should be aware, that requiring companies to use national content will make natural-gas exploration and production more expensive and that the obligation to use national-content clauses should be accompanied by knowledge transfer, so that local companies become more competitive both in the Mexican and international markets. In practice, according to industry participants, it is very difficult to keep track of whether a company complies with the regulation on minimum national content since all the suppliers used by exploration and extraction companies (who have their own sub-contractors and, in turn, their sub-contractors) have to be taken into account. Market participants claim to face uncertainty concerning which accountability methodologies to use in order to estimate whether they comply with the requirements of the provision. The OECD recommends clarifying the methodology for companies to easily calculate and measure the

national content they must use. For the moment, the OECD makes no other recommendation concerning national content and the minimum percentage of national content companies must use, since helping national industry and allowing for knowledge transfer is a legitimate objective

- **Requirement for SENER, CNH and CRE to prefer a Mexican offer under "equivalent conditions".** When issuing permits and granting assignments and contracts for the exploration and extraction of gas, SENER, CNH and CRE, taking account of the opinion of SE, must include in the terms and conditions a clause stating that under equivalent conditions of price, quality and timely delivery, assignees, contractors and permit holders must contract Mexican goods and services. The Hydrocarbons Law does not define the exact meaning of "equivalent conditions". It is therefore unclear how it is determined when conditions are indeed "equivalent" since two offers will never be identical in terms of price, quality and delivery. Also, it does not seem that the provision is often applied in practice. The OECD recommends the Mexican government abolishes the part of the provision related to the preference for national staff or nationally produced goods under equal circumstances. A transition period could be foreseen to grant Mexican companies time to adapt to new market conditions. Alternatively, the Mexican government could consider issuing guidelines in order to clarify how to determine when circumstances are equal in which case the preference for national products and labour should apply.

- **Requirement for assignees and contractors to prefer Mexican offer under "equivalent conditions".** For exploration and extraction of hydrocarbons carried out in Mexican territory, the government can either grant assignments to SPEs or contracts to private companies or SPEs. Subcontracting undertaken by assignees and contractors is regulated in terms of national origin of subcontracted goods and services. In particular: i) contractors or assignees must hire local companies if they offer "equivalent conditions to the existing ones in the international market, including quality, availability and price"; and ii) contractors or assignees must preferably buy "nationally produced materials, equipment and other goods, if they are offered under 'equivalent conditions' to those available in the international market, including in terms of quantity, quality, delivery dates and price". In both cases, the best offer should be determined according to "market rules", which are defined as a "competition principle under which the parties involved in a transaction are independent and participate under equality of conditions and out of self-interest". As there is no clear definition of what constitutes equivalent conditions in an offer or a more extensive definition of "market rules" to identify the best offer, there is a risk of discretionary behaviour. Also, foreign or Mexican suppliers participating with foreign products or services might be discriminated against. The OECD recommends the Mexican government abolishes the part of the provision related to the preference for national staff or nationally produced goods under equal circumstances. A transition period could be foreseen to grant Mexican companies time to adapt to new market conditions. Alternatively, the Mexican government should consider issuing guidelines in order to clarify how to determine when circumstances are equal in which case the preference for national products and labour should apply.

1.3.1.3. Permits and authorisations

- **Social-impact study.** SENER, with the collaboration of the Ministry of Interior (*Secretaría de Gobernación, SEGOB*) and other relevant authorities, will undertake a social-impact study (*estudio de impacto social*) before running tenders for contracts for the exploration and extraction of hydrocarbons or before assigning an area to an SPE. According to market participants, the General Directorate of Social Impact and Surface Occupation has limited staff and, as a consequence, the analysis of social-impact assessment submissions can take a considerable amount of time. As a consequence, additional suppliers might be delayed in entering the market. The OECD recommends granting sufficient resources to SENER's General Directorate of Social Impact and Surface Occupation so it can issue resolutions within shorter time frames. Costs may be passed onto assignees or contractors as a fee for the analysis of social-impact assessment submissions.

- ***Registry of Importers.*** Importers of hydrocarbons must be included in the Registry of Importers (Padrón de Importadores), as well as the Registry of Importers of the Hydrocarbons Sector (Padrón de Importadores Sectorial de Hidrocarburos). Both registries are held by the Tax Administration Service (Servicio de Administración Tributaria, SAT). For each transaction, importing companies must provide the Registry of Importers of the Hydrocarbons Sector with information including from whom they will buy the gas or natural gas and to whom they will sell it, as well as proof that their clients have CRE permits for storage or distribution. The requirement for importers to name their buyers in advance might inhibit imports of LPG and natural gas. Some market participants have described these entry conditions as excessive. Also, requiring applicants to provide a list of customers to whom they will sell imported products might delay imports, as importers may not yet know potential clients. The OECD recommends eliminating the requirement that importers of LPG and natural gas must indicate in advance to the Registry of Importers of the Hydrocarbons Sector to whom they will sell imported LPG or natural-gas products.

- **Registration of third parties with CNH.** For exploration and extraction of hydrocarbons carried out on Mexican territory, assignees as well as contractors have to submit annual reports to CNH detailing the quantity of reserves (i.e. 1P, 2P, 3P). These must be certified by independent third parties (*terceros independientes*), experts on the classification, analysis, estimation, assessment and certification of reserves. One requirement to be an independent third party is having at least ten years' experience in the oil and gas industry in areas such as exploration, geology, geophysics, reservoir engineering, production or economic assessment. The law is not clear about whether international experience is regarded as equivalent to experience in Mexico. The OECD thus recommends clarifying in the legislation that international experience is regarded as equivalent to experience in Mexico.

1.3.1.4. PEMEX

- **Possible conflict of interest within the Mexican Institute of Petroleum (Instituto Mexicano del Petróleo, IMP).** The Mexican Institute of Petroleum is a public research institution for the oil industry that provides technical goods, such as patented technologies, and services for research and training to develop and educate highly specialised Mexican technicians. It was created in 1965 to support PEMEX and now provides technical assistance to the whole industry. The IMP has

a board of directors consisting of the Minister of Energy, two independent experts and representatives of three universities, as well as the ministers or general directors of SHCP, SEMARNAT and PEMEX. As PEMEX has a seat on IMP's board of directors, the institute benefits from the company's large industrial experience and knowledge. However, PEMEX participation on the board of directors of a research institution providing technical support to the whole oil industry may influence the institute's decision-making process in PEMEX's favour. For instance, IMP may conduct specific research projects to favour PEMEX or PEMEX may have access to sensitive industry data, as well as knowledge of new patented IMP technologies. The OECD recommends amending the legislation mentioning rules on the Mexican Institute of Petroleum's independence to avoid any possible conflict of interest. This should include a provision that allows board members to recuse themselves when voting on any matters that could create a possible conflict of interest.

- **Compensation payments to PEMEX.** SENER selects areas (*áreas*) to be tendered for the exploration and extraction of hydrocarbons. After the selection of an area, CNH becomes responsible for granting exploration and production contracts for it through tender processes. According to the 2013 energy reform, if PEMEX invests in the development of a project (for example, it has financed the seismic study, exploration or even drilling) that is then awarded to a different company, SENER should determine the level of compensation that PEMEX should receive from the production company after estimating the "fair economic value" of the investment cost. According to the Ministry of Interior (*Secretaría de Gobernación, SEGOB*), general guidelines that describe the methodology for calculating "fair economic value" do exist, but remain unpublished. Furthermore, in the few cases that have so far been determined (all in midstream cases), PEMEX claims that its compensation was undervalued. The lack of specific guidelines to determine "fair economic value" could affect both PEMEX and its competitors if a payment is over- or underestimated. The OECD recommends publishing the methodological guidelines used to determine the compensation to PEMEX, and the level of compensation for investments in areas that are later granted to other companies.

- **Farmouts.** Farmout agreements – also known in Mexico as strategic agreements (*asociaciones estratégicas*) – are agreements between an SPE that has been granted an assignment (such as the mineral rights of an area) and a private company that is interested in providing services to the SPE for the project in exchange for a percentage of the proceeds in kind, In Mexico, the usual arrangement of a farmout involves PEMEX being granted an assignment by CNH and then requesting permisison from CNH to bring onboard a partner. Currently, an SPE is consulted during the pre-qualification stage about possible partners, but its choice is not binding. For example, if PEMEX has been assigned an area in which it wants to explore and produce hydrocarbons, but does not want to make all the financial investment, it might seek a partner. Yet, to do so it needs to ask CNH to hold a farmout-agreement procedure. According to PEMEX, this procedure can be lengthy and dissuade potential partners. The OECD recommends allowing SPEs to decide when to start a tender procedure, run the process and choose their own farmout partners. The process should be supervised, rather than managed, by CNH to guarantee a fair and transparent process.`

- **Processing of gas through PEMEX.** Currently, PEMEX owns the only nine natural-gas processing plants (*complejos procesadores de gas*) in Mexico. Processing gas is not subject to economic regulation, such as tariffs or open-access obligations. Companies wanting to process natural gas in Mexico have to use facilities that belong to PEMEX. As this could lead to PEMEX using its market power when negotiating prices and conditions for access, the OECD proposes to study the possibility of regulating access to PEMEX's natural-gas processing facilities for a limited time period. This right to access could be limited, for instance, to a five-year period and be granted on a non-discriminatory basis. Any study might, however, find strong arguments against the regulation of processing, particularly as natural-gas processing is generally not regarded a natural monopoly. Interested parties could choose to either negotiate with PEMEX or, if not satisfied with the conditions, build their own processing facilities or use processing facilities abroad.

1.3.1.5. Non-harmonised standards

- **Non-harmonised standards.** The OECD recommends updating all Mexican Official Standards (NOMs) so that they are in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if international standards or best practices already exist. The *National Standardisation Programme for 2018* mentions that four of these NOMs (NOM-001-SEMARNAT-1996, NOM-115-SEMARNAT-2003, NOM-143-SEMARNAT-2003 and NOM-138-SEMARNAT/SSA1-2012) are currently being modified.

1.3.2. Midstream

The midstream sector comprises the transportation, mainly by pipeline, and storage of gas. The main issues and recommendations are as follows.

1.3.2.1. Construction of new infrastructure for natural gas

Currently, only 8% of Mexican households use natural gas as their main fuel source. The reason for this is that most households, as well as the communities they live in, are not connected to natural-gas pipelines and thus have to rely on LPG, which tends to be more expensive. The OECD recommends a number of measures to facilitate the building of natural-gas pipelines. If implemented, those measures would lead to more consumers having a choice between LPG and natural gas. The OECD estimates that the benefit to consumers would range between MXN 1 395.7 million and MXN 2 670 million. For the lower bound, it was assumed that 50% of households currently using stationary LPG tanks would change to using natural gas. For the upper bound, it was assumed that 25% of households currently using LPG cylinders would additionally switch to natural gas. Details of the quantification are explained in Annex 2.A.1

- **Municipal permits.** Market participants have frequently described obtaining the necessary construction permits from municipal authorities as the biggest obstacle to building new gas pipelines. According to point f, letter V of Article 115 of the Mexican Constitution, municipal governments have the power to issue construction permits and licences. According to market participants, municipal governments frequently deny or significantly delay construction permits to companies that already possess a federal CRE permit to transport natural gas through pipelines.

Difficulties in obtaining municipal permits for infrastructure construction delays, or in some cases even prevents, the development of natural-gas pipeline projects. Natural-gas companies cannot easily enter regional markets and compete with local LPG distributors. The OECD recommends establishing a department within a federal agency to facilitate business for natural gas and LPG companies at a municipal level and provide that department with sufficient financial and human resources. This department would work within the limits of Article 115 of the Mexican Constitution and respect municipalities' autonomy in the authorisation of land use and issuance of construction permits. This department's tasks might include:

- suggesting models of permit applications (*modelos de solicitudes de permiso*) to municipal authorities;
- signing collaboration agreements (*convenios de colaboración*) with municipal authorities or states;
- advising applicants on how to best deal with municipal authorities;
- publishing an annual report about the situation of LPG companies at the local level;
- holding capacity-building workshops with municipal officials; and
- acting as amicus curiae in legal cases about municipal permits that have been unfairly denied.

- **Misalignment of interests between municipal authorities and companies.** There seems to be a general misalignment of interests between municipal authorities and companies interested in developing natural-gas transport and distribution projects in municipalities. Municipal authorities frequently do not support (and even hinder) new projects for the building of natural-gas pipelines, delaying and even preventing many natural-gas projects at a municipal level. As a consequence, natural-gas distributors are often not able to compete with LPG distributors. The OECD recommends studying the possibility of granting incentives to municipalities (such as contributions in the form of infrastructure payments or regular compensatory payments for the use of community ground based upon the amount of natural gas sold in or transported across their territories). Care should be taken so that any payments suggested in this study do not lead to discrimination between natural-gas and LPG suppliers.
- **Change of land use.** Natural-gas companies intending to build a pipeline have to change the land-use registration of the land on which the planned pipeline is to be built. Much of the land in question is currently registered as forestry at the Ministry of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales, SEMARNAT*). Companies interested in changing the land-use registration of forests (*cambio de uso de suelo en terrenos forestales*) for their projects have to fill in a form issued by SEMARNAT and submit it to ASEA. If SEMARNAT does not issue a resolution within this timeframe of 60-75 work days, and does not have a reason to "stop the clock", the application is automatically rejected (*negativa ficta*). The OECD recommends changing the legislation so that if SEMARNAT, through ASEA, does not answer a request for changing the use of land for building a natural gas pipeline within the established timeframe, an *authorisation* (instead of a rejection) will be granted by default (*afirmativa ficta*).

This change would avoid project delays for new gas-pipeline projects. In cases where an authorisation granted by default leads to unforeseen negative consequences (such as environmental damage), SEMARNAT should be able to challenge or withdraw the authorisation (within a limited time frame).

- **Compensation of land owners.** Natural-gas companies intending to build a new pipeline have to agree a compensation payment with owners or holders of land (*titular o propietario de la tierra*) for the use of their property. Usually, there is no expropriation of land for natural-gas pipelines (unlike land for roads, for example), as pipelines are not built by the state. The current law does not foresee a maximum payment amount to be paid to the owner or holder for the use of the property. This lack of a maximum gives the landowner or holder strong bargaining power and the possibility of setting high prices and raising the cost of building natural-gas pipelines. Also, negotiations with landowners or holders may lead to delays in building the pipelines and restrict natural-gas companies wishing to enter regional markets and compete with local LPG distributors. The OECD recommends that decisions about compensation for use of land for building of new natural-gas pipelines should be made by government authorities. Compensation for landowners on whose ground a pipeline for natural gas is to be built should be set by a federal authority and not be determined in bilateral negotiations between a gas company and a landowner or holder.
- **Validation of contracts by a local judge**. Assignees or contractors (in this case, gas companies) negotiate agreements with landowners or holders to establish compensation payments and conditions for the use of land through which gas pipelines pass. Once negotiations have ended, a local judge must validate each contract before it enters into force. This might delay the construction of natural-gas pipelines and restrict the ability of natural-gas distributors to compete with LPG distributors. The OECD recommends that notaries, as well as local judges, should also be able to validate contracts between gas companies and landowners.

1.3.2.2. Obligations to report to authorities

- **Double-notification of SENER and SEDATU concerning negotiations with owners.** When a gas company interested in building a new pipeline begins compensation negotiations with landowners or holders, it must notify SENER and SEDATU separately of each negotiation on a property-by-property (*predio por predio*) basis. Both SENER and SEDATU use their own notification forms, even though both demand similar data. The need to notify two authorities on this basis and provide similar data twice generates unnecessary administrative burdens for companies and might unnecessarily delay projects. OECD recommends combining these two notification templates for the reporting of negotiations between owners and gas companies, so that only one need be submitted to either SENER or SEDATU.
- **Need to obtain a planning report from ASEA.** NOM-003-ASEA-2016 establishes that each time permit holders for distribution of natural gas or LPG build new infrastructure, extend or modify their facilities, they must obtain a planning report (*dictamen de diseño*) from a verification unit (an accredited third party that performs conformity evaluation activities). The wording of this NOM implies that permit holders must obtain a new planning report for every modification to their facilities, no matter how minor. According to industry participants, however, in

practice, the norm is applicable only for new pipelines. The text of the NOM might lead to uncertainty for industry participants. The OECD recommends clarifying the legislation so that this provision is only applicable when building new pipelines.

- **Double reporting of accidents to CRE and ASEA.** Importers and exporters of natural gas, as well as permit holders for the transport, storage and distribution of natural gas must notify CRE about any loss (*siniestro*) or incident that takes place. This report must be presented to CRE within ten working days following the date of the incident or loss. Companies must also provide a similar report to ASEA. The OECD recommends allowing companies to provide a single report to ASEA and CRE. Ideally, this report should be uploaded to a common one-stop-shop platform (*ventanilla única*) after which the information could be accessed by both agencies. The creation of the Co-ordinated Assistance Office for the Energy Sector (Oficina de Asistencia Coordinada del Sector Energético, ODAC) is a first step in this direction.

1.3.2.3. Asymmetrical regulation of PEMEX

The 2013 energy reform changed the legal status of PEMEX and established "asymmetrical regulation", meaning that the former state monopoly is subjected to greater regulatory restraint than other participants in the gas industry for such a time as deemed necessary to rebalance its dominant market position. Provisions restricting PEMEX in its business practices are below.

- **The requirement to publish its first-hand sales (*ventas de primera mano*, VPM) of natural gas on an "information system".** VPM are defined as the first transfer on Mexican soil of a hydrocarbon to third parties by a Mexican SPE or a private company on behalf or at the behest of the state. The regulation requires PEMEX to use its information system to publish a list of all contracts and transactions that PEMEX's subsidiaries have concluded between themselves for the VPM of natural gas, including information of the purchase-sale terms, prices and quantities of these contracts and transactions. All this information must be made available by PEMEX to potential buyers of VPM natural gas. PEMEX's incentives to offer discounts to targeted customers may be reduced, as its competitors might be able to observe those discounts in the information system and react to them within short time periods.
- **VPM prices for LPG must be approved by CRE.** CRE introduced a methodology that allowed PEMEX to compute maximum prices for LPG VPM. The formula used by PEMEX (and monitored by CRE) takes into account several factors, including the value of LPG at the relevant reference point (borders or ports where LPG can be imported or exported) in order to determine the price at each of PEMEX's processing facilities; the minimum transport cost to deliver LPG to each selling point; and infrastructure costs. PEMEX claims that maximum-price regulation makes it slow to adapt to new market situations as CRE approval is required for every new LPG VPM selling point before its application, which might take several months.
- **Commercialisation contracts for LPG and natural gas must be approved by CRE and include the right to an early termination.** CRE must approve commercialisation contracts that PEMEX subsidiaries sign with buyers. CRE resolution RES/1520/2017 provides a template contract that PEMEX Industrial

Transformation (PEMEX Transformación Industrial, PEMEX TRI) can sign with buyers for the commercialisation of LPG. The 13th clause of this template – which PEMEX claims it is required to include by CRE – establishes that the contract can be terminated before the official end date by either party with at least 30 working days' notice. The mandatory clause diminishes PEMEX ability to plan long-term as customers are able leave at short notice.

- **Prices at which PEMEX sells wet gas are regulated (upstream restriction).** Before the 2013 energy reform, PEMEX subsidiary PEMEX Exploration and Production (PEMEX Exploración y Producción, PEP), together with the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público, SHCP*) calculated the internal price that PEP could charge to PEMEX subsidiaries for wet gas, among other hydrocarbons. Article 82 of the Hydrocarbons Law establishes that CRE can issue regulations on the terms and conditions, as well as prices for those hydrocarbons activities subject to CRE regulation. Therefore, the prices and terms and conditions at which PEP sells wet gas (among other products) to PEMEX TRI, another PEMEX subsidiary, can be determined by CRE. According to the 12th recital of resolution RES/389/2014, as long as CRE considers its own material and human resources insufficient to calculate prices and publish terms and conditions, then 2014 prices and terms and conditions for selling all hydrocarbons, which include wet natural gas, will continue to apply. The resolution is not clear, however, about the price level of wet gas sold by PEP to private companies. According to PEP, CRE is planning to issue a price methodology in the near future, though it will not include sales terms and conditions. This restriction stops PEP charging its chosen sale price and so limits its ability to sell wet gas to other PEMEX subsidiaries, particularly since, according to PEMEX, the regulated price is uncompetitive based on current market conditions. Also, it seems that there is no mechanism for PEMEX to sell to third parties; PEMEX does not publish a price for third parties as CRE does not permit this.

The OECD generally supports asymmetrical regulation. It proved difficult, however, to gather information about the current status of the asymmetrical regulation affecting PEMEX and when regulation restricting its business practice will be lifted. The OECD recommends therefore that CRE publishes regular (for example, annual) reports about the status of markets in which PEMEX is subject to asymmetrical regulation. In these reports, CRE should explain the criteria on which its evaluation is based for each market and the changes still needed for asymmetrical regulation to be lifted.

1.3.2.4. General

- **Requirement for natural-gas processing permit holders to buy national goods and services.** SENER permits for natural-gas processing have terms and conditions that stipulate permit holders must choose Mexican goods or services if Mexican and foreign providers offer "equivalent conditions", such as similar prices, quality and delivery times. This regulation contains neither a definition of "equivalent conditions" nor further explanations about equality of prices, quality and timely delivery. The OECD recommends the Mexican government abolishes the clause of the provision related to the preference for national staff or nationally produced goods under equal circumstances. A transition period could be foreseen to grant Mexican companies time to adapt to new market conditions. Alternatively, the Mexican government should consider issuing guidelines in order to clarify how to

determine when circumstances are equal in which case the preference for national products and labour should apply.

- **Lack of regulation for setting tariffs.** There is no detailed regulation for the tariffs applied to integrated systems, which are systems for the transport of gas through pipelines and its storage grouped together for tariff purposes. Companies that transport natural gas require a CRE permit, which has an annex called Terms and Conditions for the Provision of Services (Términos y Condiciones para la Prestación de los Servicios, TCPS) that establishes general tariffs (such as maximum tariffs), rights and obligations permit holders must apply to their users. The lack of a detailed methodology regulating the setting of tariffs within integrated systems creates legal uncertainty for users of natural-gas transport capacity. The OECD recommends establishing specific regulations that provide users with certainty about levels of transport tariffs. The tariffs, as well as their methodology, should be published and easily accessible.
- **Non-harmonised standards.** The OECD found five NOMs that specifically state that they are not in line with international norms. This might hinder access for foreign competitors to the Mexican market, as well as access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. The OECD recommends updating all norms so that they are, as far as possible, in line with international standards and that they state when there are no existing international standards or best practices.

The main recommendations for the midstream gas sector are described in Chapter 2 and listed analytically in Annex B.

1.3.3. Downstream

The downstream sector comprises the distribution and retail of LPG and natural gas. The main issues and recommendations follow.

1.3.3.1. Liquid petroleum gas (LPG)

- **Municipal land permits for distributors.** Distributors wishing to distribute LPG through plants must apply for a permit from CRE and also obtain a land-use permit from municipal authorities. Municipalities have the power to authorise, control and oversee the use of land within their competence. Municipal legislation on land use differs significantly between municipalities. There is no nationwide standard of how municipalities grant land permits. While not a problem in some areas, in others, LPG operators face serious difficulties in accessing land on which to build LPG-distribution plants. As described above for the midstream sector, the OECD recommends establishing a department within a federal agency to facilitate business for LPG companies at a municipal level and providing that department with sufficient financial and human resources.
- **Municipal permits for retailers of LPG cylinders.** Retailers often have difficulties selling LPG cylinders due to complications in obtaining municipal permits. Currently, LPG cylinders in Mexico are mainly sold by distributors. Very few retailers (for example, supermarkets or service stations) are active in the market selling LPG cylinders to end consumers from their premises. Municipal permits are often difficult to obtain as requirements can vary across municipal authorities and must be obtained on an establishment-by-establishment basis (i.e. individually for

each store or service station). The lack of clear criteria for the granting of municipal permits appears to make the sale of portable cylinders at retail stores and service stations more difficult. The lack of additional suppliers, especially retail stores and fuelling stations, deprives consumers of greater diversity and better prices. The OECD recommends establishing a department within a federal agency to facilitate business for LPG companies at a municipal level, as described in 1.3.3.1. For retail storage facilities selling LPG cylinders (*bodegas de expendio*), the department could also offer model permit applications to municipalities. If the OECD recommendation to increase the number of LPG distributors is fully implemented, and consequently more supermarkets and large fuelling stations are able to sell portable cylinders, the benefit to consumers is estimated at between MXN 787.1 million and MXN 1 338.8 million. For the lower bound, benefits were calculated based upon having one additional supplier of LPG cylinders in small cities with fewer than 100 000 habitants (where currently competition is often limited due to a low number of suppliers). For the upper bound, OECD assumed that having one extra supplier in cities with more than 100 000 habitants would also lead to a price decrease (though a smaller one). Details of the quantification are explained in Annex 2.A.

- **Duration of CRE permits for LPG-related activities.** Several permits for LPG-related activities can be granted for up to 30 years, and extended once for up to half of their original duration. The duration of permits might pose competition concerns as, due to the lack of guidelines, authorities could theoretically discriminate between applicants in a same activity by granting permits with different durations to different applicants. A competitor having to renew a permit with a shorter duration would have to bear additional costs in comparison to a competitor holding a permit with a longer duration. The OECD recommends that CRE issues guidelines for determining the duration of LPG-related permits depending on the specific activity in order to give more transparency to market participants.

- **Time frame for CRE to issue LPG permits.** A number of LPG activities such as transport, storage, distribution and retail require a CRE permit. CRE has 90 working days after receiving an application to decide whether to grant or refuse a permit. For certain other activities, it only has 78 working days (for example, commercialisation of LPG and propane; distribution of LPG through plants; LPG retail through service stations for own consumption; and LPG retail through retail storage facilities). It is claimed by some market participants that CRE takes too long to issue permits and extends official deadlines (this claim is difficult to verify). Participants are kept out of the market until they obtain a permit from CRE. The OECD recommends that CRE publishes an annual report with statistics on the average time needed to issue different types of permits, as well as how often additional information is required. Moreover, explanations should be provided for cases in which CRE did not meet its own deadlines. The OECD encourages CRE to pursue its effort in reducing the time frame for permit issuance.

- **CRE authorisation of new vehicles used to distribute LPG.** If a company holding a CRE permit to distribute LPG through plants decides to acquire new vehicles, such as new tanker trucks or cylinder-delivery trucks, it has to submit a request to CRE to update the permit title (issued as an authorisation). This stops companies immediately using their newly acquired vehicles. The OECD recommends that companies should only have to notify CRE of the acquisition of

new vehicles to distribute LPG through plants. As part of that notification, companies would need to confirm that they comply with all requirements, as well as provide each vehicle's insurance policy.

- **Ownership regime of LPG cylinders.** In Mexico, there are currently two types of LPG cylinders: those branded by LPG distributors; and generic unbranded cylinders. Branded cylinders can only be filled by the distributor that branded them, while generic cylinders can be filled by any LPG distributor. Currently, there is a lack of regulation of LPG cylinders, but CRE has said that it is working on new General Administrative Provisions. The OECD recommends issuing regulations that deal with the exchange of branded cylinders; standard deposits for exchanges; the creation of cylinder-exchange centres; forcing distributors of branded cylinders to accept competitors' branded cylinders; and preventing distributors of branded cylinders from holding competitors' cylinders. The OECD does not make any recommendation about the question of whether a branded or a generic system is preferable as this seems to be a security, rather than a competition, issue.
- **Partial filling of LPG cylinders, known as *picteleo*.** *Picteleo* has been a long-standing practice in Mexico, since many low-income households cannot afford to buy full cylinders. According to market participants, LPG service stations face excessive requirements and costs by complying with the required NOM, which incentivises the illegal total or partial filling of cylinders. LPG service stations that comply with the NOM are seriously disadvantaged in comparison to their non-compliant competitors. The OECD recommends reassessing safety conditions for the partial filling of cylinders (*picteleo*) taking into account international standards, and, in order to prevent illegal practices, introducing fines to guarantee that service stations that fill cylinders comply with the NOM. The OECD encourages ASEA to continue its ongoing work on revising the NOM.
- **Inspection system for LPG cylinders.** NOM-011/1-SEDG-1999 sets minimum safety conditions for the portable containers in which LPG is distributed – cylinders weighing less than 25 kg. It foresees that at distribution storage facilities where, on average, fewer than 1 000 cylinders are filled a day, 10% of cylinders should be checked daily by the distributor. For distribution storage facilities where, on average, more than 1 000 cylinders are filled a day, 200 cylinders must be inspected daily. The provision's difference in the number of cylinder inspections discriminates against storage facilities filling more than 2 000 cylinders a day. The OECD recommends introducing an inspection system that is more gradual in the percentages of LPG cylinders requiring inspection.
- **No PROFECO NOM to deal specifically with the verification of LPG cylinders' net content.** Currently, there is only a general norm on the verification of the net content of pre-bottled products. This lack of a specific LPG NOM could leave PROFECO with too much discretion when verifying cylinders' contents and might potentially put some LPG distributors at a disadvantage. The OECD recommends the issuance of a NOM that deals specifically with the verification of the net content of LPG cylinders by PROFECO. It should take account of existing international standards in order not to generate barriers to entry.

1.3.3.2. Natural gas

- **Duration of CRE permits for natural-gas related activities.** A number of natural-gas-related permits can be granted for up to 30 years, and extended once for up to half of their original duration. As for LPG activities above, the OECD recommends that CRE issues guidelines for determining the duration of natural-gas-related permits depending on the specific activity in order to give more transparency to market participants.
- **Exchange of information with PEMEX Etileno.** PEMEX Etileno is a PEMEX subsidiary that produces, distributes and commercialises derivatives of methane (the main component of natural gas). PEMEX Etileno's management responsibilities (*gerencia de comercialización*) include being in contact with industrial associations and petrochemical producers to exchange information about the markets in which PEMEX Etileno is active, as well as to find new business and investment projects and opportunities. The provision may facilitate collusion since it states that PEMEX Etileno should co-ordinate with producers, distributors and retailers of methane. The OECD recommends clarifying in the legislation that PEMEX Etileno must take into account letter V, Article 53 of the Ley Federal de Competencia Económica and COFECE's guidelines on information exchange.

1.3.3.3. Regulation affecting both natural gas and LPG at the downstream level

- **One-stop shop (*ventanilla única*).** There is currently no one-stop shop through which market participants can deal with authorities in the natural-gas and LPG sectors. Participants in the natural-gas and LPG sectors have to apply and deal separately with ASEA, CRE and CNH. Industry participants have reported that it is sometimes unclear which agency has authority and which should be contacted. The OECD recommends introducing a one-stop shop for procedures related to ASEA, CRE and CNH, and possibly also SENER and SAT.
- **Co-ordinated inspections of CRE and ASEA.** Companies that operate in the LPG and natural-gas sectors are subject to verification inspections (*visitas de verificación*) by CRE and ASEA. According to market participants, while legislation clearly establishes the powers of the two authorities in practice, there seems to be some overlap in the requirements demanded by authorities during verification visits. The OECD recommends issuing guidelines for co-ordinated inspection visits by CRE and ASEA, as well as establishing an interagency body between CRE and ASEA to help co-ordinate visits.
- **Independent third parties to assure compliance with law.** ASEA uses independent third parties for supervision, surveillance, assessment, investigation and auditing of the General Administrative Provisions (Disposiciones Administrativas de Carácter General, DACG) that it issues. It runs calls for corporate entities interested in becoming third parties, which are published in the National Official Gazette (Diario Oficial de la Federación, DOF). Participants claim that the limited number of authorised third parties leads to high fees for their services. The OECD recommends taking additional measures to increase the number of ASEA-authorised third parties in the market. These measures could include re-evaluating the conditions for authorising third parties and more widely publicising the calls for third parties.

- **Natural-gas and LPG price-comparison tool for residential consumers.** No easy-access database enabling residential consumers to compare LPG and natural-gas prices currently exists, limiting their ability to take optimal decisions. The OECD recommends introducing a tool (for example, a website or an app) that enables residential consumers to compare the prices of LPG and natural gas in their area. Published information should be presented in an aggregated form (for example, average price in that area) to prevent the tool leading to illegal information exchange and co-ordination among distributors.
- **Non-harmonised standards.** The OECD team found 22 NOMs at the downstream level that contain statements that are not in line with international norms. This might hinder foreign competitors' access to the Mexican market, as well as Mexican producers' access to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. The OECD recommends updating all norms so that they are, as far as possible, in line with international standards and that they state when there are no existing international standards or best practices.

The main recommendations are described in Chapter 2 and listed analytically in Annex B.

1.4. Quantification of the recommendations

Quantifying a large number of the effects of the OECD recommendations proved impossible, either because of a lack of data or because of the nature of the regulatory change. Also, current prices for natural gas at the upstream level, as well as production levels, are historically low. This results in the baseline for calculation of benefits being low. Nevertheless, it is clear from the above that the consequences for the Mexican economy in terms of long-term positive economic effects on productivity and growth will be significant, provided all the recommendations are implemented in full.

More specifically, if the particular restrictions identified and quantified during the project are lifted, the OECD has calculated an annual positive effect for the Mexican economy of between MXN 2182.8 million and MXN 3740.3 million. These figures are based upon the extremely small number of recommendations at the midstream and downstream level that the OECD team was able to quantify. The quantification are minimum effects; in other words, the full effect on the Mexican economy is likely to be much larger. At the upstream level, this may lead to Mexican-produced gas replacing foreign gas, and so a reduction in imports and a boost to national production. This may also increase investment into the national infrastructure with possible long-term benefits.

Although only a relatively small benefit for the Mexican economy could be quantified, the OECD team considers that the cumulative, long-term impact of lifting all of the restrictions identified as harmful, including those that were more technical in nature (for example, registration of new vehicles) should not be underestimated. The rationalisation of the body of legislation in these sectors will also positively affect the ability of businesses to compete in the longer term, provided that the recommendations are fully implemented. Finally, by removing obsolete or redundant legislation, investors will face a more transparent and certain business environment.

Table 1.2 summarises the quantifiable effects of lifting the regulatory barriers to competition for selected obstacles.

Table 1.2. Synthesis of positive effects quantified by item

Restriction	Number of provisions affected	Annual benefits (MXN, millions)
Midstream: increase in construction of natural-gas pipelines by simplifying the regulatory environment	6	1 395.7-2 670
Downstream: sale of LPG cylinders	1	787.1-1 070.3
Total	**7**	**2 182.8-3 740.3**

Note: In February 2018, COFECE published *Transition Towards Competitive Energy Markets: LP Gas* (www.cofece.mx/wp-content/uploads/2018/06/Libro-GasLP_web.pdf), which was written independently of the OECD Competition Assessment project on gas. In its study, COFECE estimated that an increase in the number of competitors will significantly reduce LPG's average final price; for example, when a region increases the number of distributors from one to two, prices may diminish in 6.5%.

1.5. Conclusion

The present chapter summarises the main findings and recommendations resulting from the analysis of 279 provisions. If the OECD recommendations are fully implemented, dynamic effects should bring benefits to consumers in Mexico and to the Mexican economy.

Throughout this report, the OECD team has sought to identify the sources of those benefits and, where possible, provide quantitative estimates. Yet, because the benefits of competition arise from innovative actions by many private-sector agents – some perhaps not even currently operating in the market – any such estimates are highly uncertain and should be regarded as providing, at best, orders of magnitude for likely effects. The aim of the report is to assess the harm to competition, and the expected benefits to consumers from lifting barriers, but quantifying the effects of lifting all restrictions proved impossible because in many cases they were unmeasurable. Out of the modest number of quantifiable issues, the OECD finds total annual effects in the range of MXN 2182.8 million and MXN 3740.3 million. This amount is based upon the few quantifiable recommendations about the upstream, midstream and downstream sectors, arising from efficiency gains and lower prices on goods and services for consumers. The positive effects on the Mexican economy over time, however, are likely to be far greater.

Benefits generally take the form of lower prices, greater choice and variety for consumers. Often, they will result from the entry of new, more efficient firms, or from existing suppliers finding more efficient forms of production under competitive pressure. As noted earlier, more competitive markets result in faster productivity growth over a longer timescale, but no attempt is made to estimate this effect.

The remainder of this report describes the results of the assessment in the gas sector. For each of the provisions or groups of provisions identified as potentially harmful, the report describes the nature of the restriction, the harm it causes to competition, the policymakers' objectives and the recommendations and associated benefits identified by the OECD.

Annex A to the report describes in detail the methodology followed in the process, both to screen the laws and regulations, and also to assess the harm to competition from the restrictions, as well as the benefits to the Mexican economy and to consumers from removing the barriers to competition.

Annex B provides a line-by-line summary of all the regulations identified in the upstream midstream and downstream gas sector, to help identify the analysed law or article, as well as a summary description of all the analyses carried out.

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Chapter 2. Evaluation of the gas sector

2.1. Economic overview

2.1.1. Definition of the sectors

This economic overview covers the gas sector, especially natural gas and its extraction, processing, transportation, distribution to final consumers, and the manufacturing of basic petrochemical products from natural gas,[1] as well as liquefied petroleum gas (LPG) and its extraction, processing, storage, transportation and distribution to final consumers.[2]

Natural gas, according to the Mexican Hydrocarbons Law (Ley de Hidrocarburos), is a mixture of gases, obtained from extraction or industrial processing. Mainly composed of methane, it may also contain ethane, propane, butanes and pentanes, as well as other components including carbon dioxide (CO_2), nitrogen sulphide (N_4S_4) and hydrogen sulphide (H_2S).[3] Natural gas is often informally referred to simply as "gas", especially when compared to other energy sources such as oil or coal. (It should not, however, be confused with gasoline, which is refined petroleum.) Natural gas is used by end customers for heating, cooling, and cooking, for example. Additionally, some enterprises may also use natural gas for on-site electricity generation. Finally, natural gas has numerous uses in petroleum refining, the metal, chemical, plastic, food-processing, glass and paper industries.

LPG is a gas produced during natural-gas processing and oil refining; it is mainly composed of propane and butane gases.[4] When subjected to modest pressure or refrigeration, these gases liquefy making it possible to transport and store LPG as a liquid, even though it will be used as a gas. This requires pressurised cylinders or containers. In Mexico, LPG is primarily used as fuel in heating appliances, cooking equipment and vehicles.

LPG is a mixture of hydrocarbons (generally, propane and butane) while natural gas is mainly composed of a single hydrocarbon (methane). Methane can be lighter than air, while LPG is heavier and denser. When released, LPG does not dissipate into the air as quickly as natural gas.

Energy Reform 2013

In December 2013, the Mexican government enacted an energy reform with the goal of ensuring greater private investment in the sector. The key principles of the reform included reaffirming state ownership over subsoil resources, guaranteeing free competition among economic actors in the sector, strengthening regulatory agencies, and a focus on transparency and accountability in new contracts.[5] This reform consisted of amendments to Articles 25, 27 and 28 of the Mexican Constitution (Constitución Política de los Estados Unidos Mexicanos, CPEUM). By August 2014, the reform had been codified in 10 new and 12 modified laws.[6]

The energy reform transformed Mexico's state-owned oil and gas company Petróleos Mexicanos (PEMEX) from a decentralised public entity into a "state productive enterprise"

(*empresa productiva del estado*, SPE). As a result, PEMEX stopped being the only operator in the Mexican oil industry and became able to enter into alliances with private companies to participate in public tenders for exploration and production activities. Private firms' participation is now also permitted in the remaining activities of the value chain; previously PEMEX was the only participant or owner of the required infrastructure (for example, production of LPG, transport and storage of natural gas).

The energy reform created new institutions to guarantee a level playing field for all competitors. These include the National Centre for Control of Natural Gas (Centro Nacional de Control del Gas Natural, CENAGAS), whose mission is to manage and co-ordinate Mexico's pipeline and gas-storage network, and the Integrated Natural Gas Transportation and Storage System (Sistema de Transporte y Almacenamiento Nacional Integrado de Gas Natural, SISTRANGAS). The reform also created the Agency for Safety, Energy and Environment (Agencia de Seguridad, Energía y Ambiente, ASEA), which regulates and supervises activities and facilities related to the hydrocarbons industry to protect the environment and guarantee industrial safety. The powers of the National Hydrocarbon Commission (Comisión Nacional de Hidrocarburos, CNH) and the Energy Regulatory Commission (Comisión Reguladora de Energía, CRE) were strengthened and extended. In particular, CNH became the authority awarding assignments and contracts for the exploration and production of hydrocarbons and CRE, the regulator and permit manager for the storage, transportation and distribution of hydrocarbons.

2.1.2. Value chain

The value chain for gas is made up of the following five main stages:

- exploration and production
- processing
- transportation and storage
- distribution
- retail.

2.1.2.1 Exploration and production

Natural gas is taken from underground wells, often as a by-product of oil extraction. After extraction, natural gas is transported through pipelines to nearby processing facilities. Natural gas must be cleaned and processed to extract impurities, including water, to produce the pipeline-quality "dry" natural gas used by end consumers.

Natural-gas sources are classified according to the type of geological formation from which they are extracted. Natural gas accumulation in a rock reservoir – typically, multiple, relatively small, permeable porous zones in various naturally occurring rock formations – is considered **conventional**. Natural gas from conventional deposits requires vertical drilling.

Unconventional gas is a generic term that includes tight gas, coal-seam gas, shale gas and methane hydrates. Recent technological developments in horizontal drilling and fracturing techniques have made some of these unconventional gas supplies increasingly commercially viable. This is particularly true of shale gas[7] extracted from shale formations, a source that has become one of the world's most important gas reservoirs. Typically located two or more kilometres underground, shale gas requires sophisticated extraction

technology, such as hydraulic fracturing (fracking), to produce gas on a commercial basis. This involves pumping large amounts of fluid into gas-bearing geological formations to create tiny pathways that make the formations more permeable.[8]

According to the US Energy Information Administration (EIA), as of May 2013, technically recoverable shale gas resources in Mexico were estimated to be equivalent to 15.4 trillion cubic metres of natural gas, placing the country in sixth place in global shale-gas resources.[9] However, the EIA also states that Mexico's potential to extract shale gas may be constrained by several factors, including the high investment cost of shale exploration, the nascent capabilities of the local shale-gas service sector, and public security concerns in many shale areas.[10] As of March 2017, PEMEX was the only company to have explored unconventional gas reservoirs.[11]

Associated and non-associated gas

Natural gas extracted from crude-oil wells is known as **associated gas**. Natural gas from gas wells is known as **non-associated gas**. Gas wells produce only raw natural gas and extremely light liquid hydrocarbons. Natural gas can also be recovered from coal mines, in which case it is known as **colliery gas** or from coal seams (**coal-seam gas**).[12]

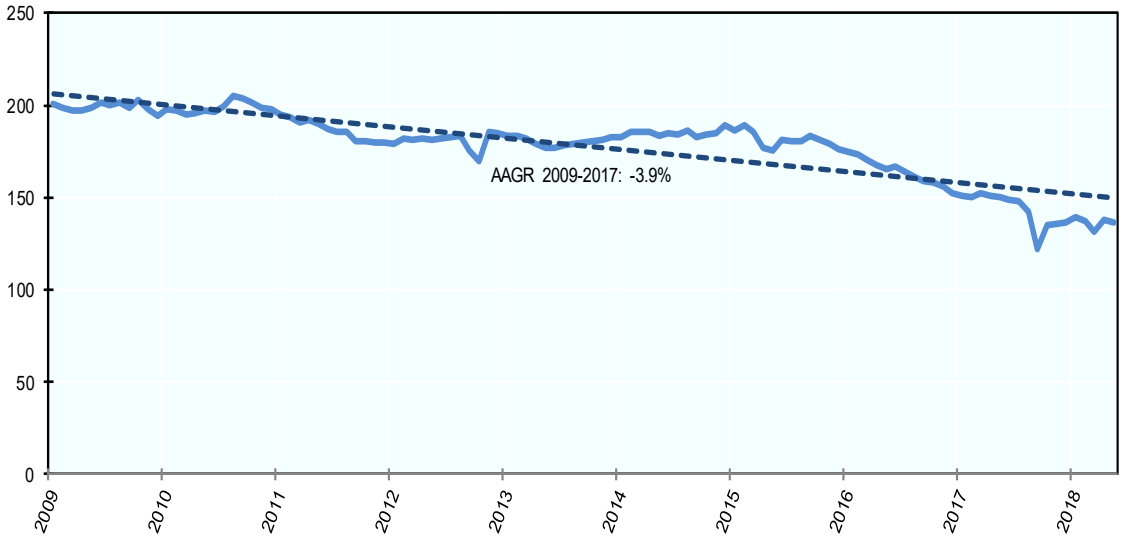
Raw natural gas consists of methane mixed with varying amounts of other substances, such as heavier gaseous hydrocarbons, acid gases (e.g. hydrogen sulphide and carbon dioxide), nitrogen, helium, water (in both liquid and vapour form), heavy metals, and liquid hydrocarbons.[13]

If after extraction natural gas contains more than 5.7 milligrams per cubic metre of hydrogen sulphide, it is known as "sour" gas. If it contains only carbon dioxide and no sulphur compounds, then it is known as "sweet" gas. It is usually desirable to remove both hydrogen sulphide and carbon dioxide to prevent corrosion problems.

Total production

Figure 2.1 shows the total production of natural gas in Mexico measured in million cubic metres per day (mcmpd) between January 2009 and May 2018. (Natural gas is usually measured either in volume – cubic metres – or calorific values; crude oil, crude-oil equivalent and liquid petroleum gas are measured in barrels of oil equivalent or boe). Between 2009 and 2017, Mexican production steadily declined at an annual rate of 3.9%, from an average of 201 mcmpd in 2009 to 137 mcmpd in 2017.[14]

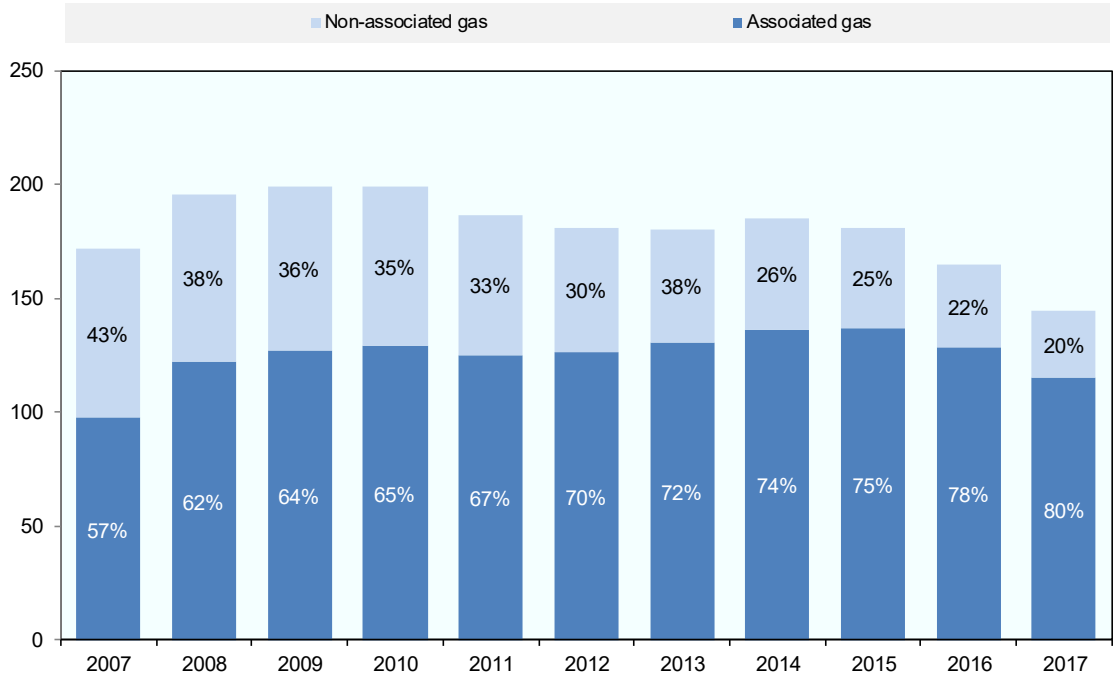
Figure 2.1. Production of natural gas (million cubic metres per day), January 2009-May 2018



Source: NEGI, "Minería > Volumen de producción de petróleo crudo y gas natural", www.inegi.org.mx/sistemas/bie/ (accessed on 14 August 2018).

In 2017, as shown in Figure 2.2, associated gas made up 80% of total production, the remaining 20% being non-associated gas production.

Figure 2.2. Production of gas, by type (mcmpd), 2006-2017



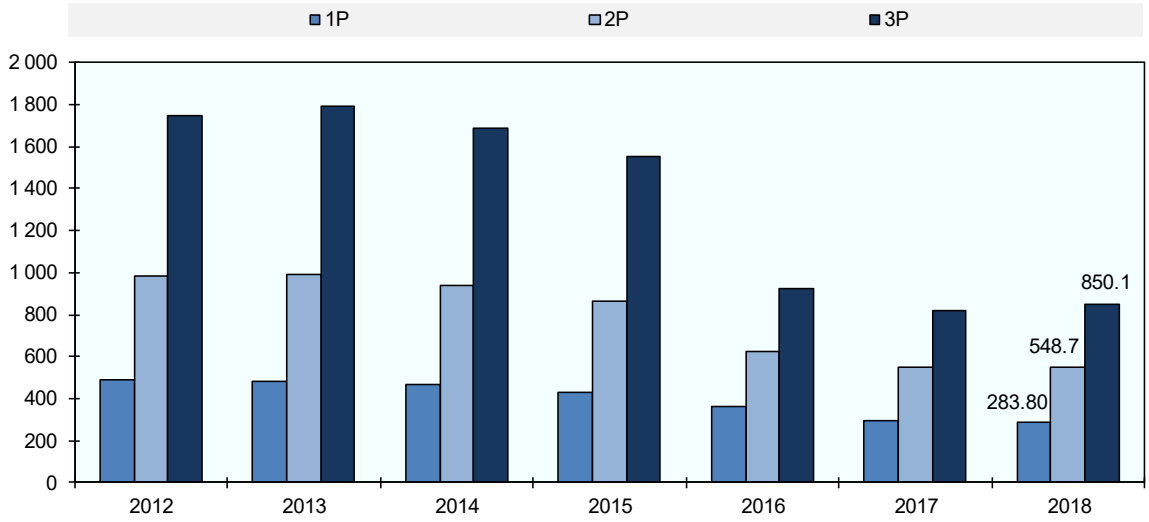
Source: CNH, "Producción nacional de petróleo y gas Diciembre 2017", https://portal.cnih.cnh.gob.mx/downloads/es_MX/estadisticas/Producci%C3%B3n%20nacional%20de%20petr%C3%B3leo%20y%20gas.pdf (accessed on 20 July 2018).

Reserves

Reserves are hydrocarbons that are economically and technically feasible to extract at existing prices. For instance, if prices are low and investment costs are high as a consequence of, say, high interest rates, it becomes unprofitable to extract hydrocarbons. Also as oil and gas are priced in US dollars, a low US dollar-Mexican peso exchange rate can make it more attractive to import, rather than extract, hydrocarbons.

Reserves of hydrocarbons are classified as "proved", "probable" and "possible", depending on the certainty of extraction. They are often categorised in one of the following three categories: 1P (proved reserves); 2P (proved plus probable reserves, i.e. 1P plus probable reserves); and 3P (proved plus probable plus possible reserves, i.e. 2P plus possible reserves). In Mexico, as of 19 July 2018, 1P reserves of natural gas totalled 283.8 billion cubic metres; 2P reserves totalled 548.9 billion cubic metres; and 3P reserves totalled 850.1 billion cubic metres.[15] According to SENER (2017a), between 2006 and 2016, the amount of economically viable natural-gas reserves diminished by 53.5% due to oil-price volatility and fluctuations in exchange and interest rates that negatively impacted PEMEX's production activity.

Figure 2.3. Natural-gas reserves (billions of cubic metres)



Source: CNIH, "Reservas de Hidrocarburos", https://portal.cnih.cnh.gob.mx/dashboard-reservas.php (accessed on 19 July 2018).

Reserves-to-production (R/P) ratios represent the length of time that remaining reserves would last if production were to continue at a certain pace. For a given year, R/P ratios are calculated by dividing remaining reserves by total production. In Mexico, R/P ratios for 2016 are shown in Table 2.1. Estimates of 1P reserves suggest that at current production levels the country has around 4.9 years of natural-gas reserves remaining.

Table 2.1. R/P Ratios

Reserves	R/P ratio
1P	4.9
2P	9.1
3P	13.6

Source: CNH, "Producción nacional de petróleo y gas", https://portal.cnih.cnh.gob.mx/downloads/es_MX/estadisticas/Producci%C3%B3n%20nacional%20de%20petr%C3%B3leo%20y%20gas.pdf (accessed on 20 July 2018) and "Reservas de Hidrocarburos", https://portal.cnih.cnh.gob.mx/dashboard-reservas.php (accessed on 20 July 2018).

Market participants for production in Mexico

Until 2013, only the Mexican state had the right to extract oil and gas. Practically, this gave PEMEX, the country's 100%-state-owned oil and gas company, the exclusive rights to explore, exploit, refine and process natural gas.[16] In 2013, the Mexican government decided to pass a substantial energy reform. This included PEMEX becoming an SPE – a state-owned enterprise with the objective of creating economic value – that enjoys far-reaching technical, management and budgetary autonomy. Article 27 of the Mexican Constitution was modified and now states that the Mexican state can carry out the exploration and extraction of oil and other hydrocarbons either through "assignments" (*asignaciones*)[17] that can only be granted to SPEs or through contracts that can be signed with both SPEs and private companies following a tender procedure. The reform also allowed PEMEX and other SPEs to enter into farmout agreements

(*asociaciones estratégicas*). Farmouts consist of agreements between an SPE that has been granted an assignment and a private company that, in exchange for providing services to the SPE, will be granted a percentage of any profits produced by that assignment. In farmout agreements, the SPE is known as the "farmor", while the private company is known as the "farmee".

Contracts with SPEs and private companies for the exploration and production of hydrocarbons are granted by the National Hydrocarbon Commission (Comisión Nacional de Hidrocarburos, CNH).[18] These contracts are not farmouts since they are directly between SPEs or private companies and the Mexican state, *not* between an SPE and a private company. Four types of contracts are used:[19]

- Production-sharing agreements (*contratos de producción compartida*), which entitle the contractor to a consideration in kind, i.e. a percentage of the commercial production.[20]
- Profit-sharing agreements (*contratos de utilidad compartida*), which compensate the contractor with direct cash payments for its services with the payment amounts usually based on the level of production.[21]
- Licence agreements (*contratos de licencia*), according to which contractors must pay the Mexican government licence fees determined by the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público, SHCP*), plus royalties, based on the contractual value or operational revenues.[22]
- Service contracts (*contratos de servicios*), according to which a contractor is paid for providing services, such as the exploration of fields or well drilling, with the payment amount not linked to the amount of production.[23]

Contracts for exploration and production of hydrocarbons are generally granted through a tender procedure. Article 27 of the Hydrocarbons Law states, however, that contracts for exploration and production of natural gas contained in mineral-coal seams may be awarded without a prior tender directly to coal-mining concessionaires.

Since 2014, CNH has been carrying out a number of tender processes, collectively called Round Zero (Ronda Cero), Round One (Ronda Uno), Round Two (Ronda Dos), and Round Three (Ronda Tres), through which 104 contracts were granted between 2015 and July 2018.[24]

Immediately after the 2013 energy reform, the Ministry of Energy (*Secretaría de Energía, SENER*) supported by CNH, awarded assignments to PEMEX without a tender procedure.[25] This was known as Round Zero.[26] Round One,[27] which took place from December 2014 to December 2016, was the starting point for competitive participation of both private companies and SPEs in the exploration and extraction of oil and natural gas in Mexico and included a series of international public tenders.[28] The Mexican state awarded 38 contracts during Round One: Five were for production-sharing contracts in shallow waters; 25 were licence-type contracts for onshore areas (Chiapas, Nuevo León, Tamaulipas and Veracruz); and 8 were licence-type for deep and ultra-deep waters (Cinturón Plegado Perdido, Salina del Istmo, and Salina del Bravo).[29][30]

During Round Two,[31] which began in July 2016 and concluded in January 2018, the Mexican state tendered additional areas for exploration with prospective resources[32] estimated at 5 653 mboe.[33] The round comprised 50 award blocks for exploration and extraction: 10 in shallow waters in the Tampico-Misantla region, Veracruz and the Cuencas del Sureste, located in the Gulf of Mexico; 21 in the Burgos region, Tampico-Misantla

region, Veracruz and the Southeast Basins; and 19 in deep waters in the Cinturón Plegado Perdido, the Cordilleras Mexicanas and the Cuenca Salina, located in the Gulf of Mexico.

CNH published the first and second calls for tender for Round Three on 28 September 2017 and 24 January 2018, respectively. The first call for tenders included 35 contractual areas in shallow waters of the Gulf of Mexico, totalling 26 265 km^2 with estimated prospective reserves of 1 988 mboe.[34] The second call for tenders covered 37 onshore conventional blocks, including 21 blocks in the Burgos region in Tamaulipas, nine blocks in the Tampico-Misantla-Veracruz region, and seven blocks in Tabasco and Campeche, covering in total 9 513 km^2, with estimated prospective reserves of 260 mboe and including wet gas, dry gas and light oil.[35] As a result of the first call for tenders of Round Three, which concluded on 27 March 2018, the Mexican state awarded 16 contracts, all of the production-sharing type.[36] The second call for tenders of Round Three has not yet concluded.

2.1.2.2 Processing

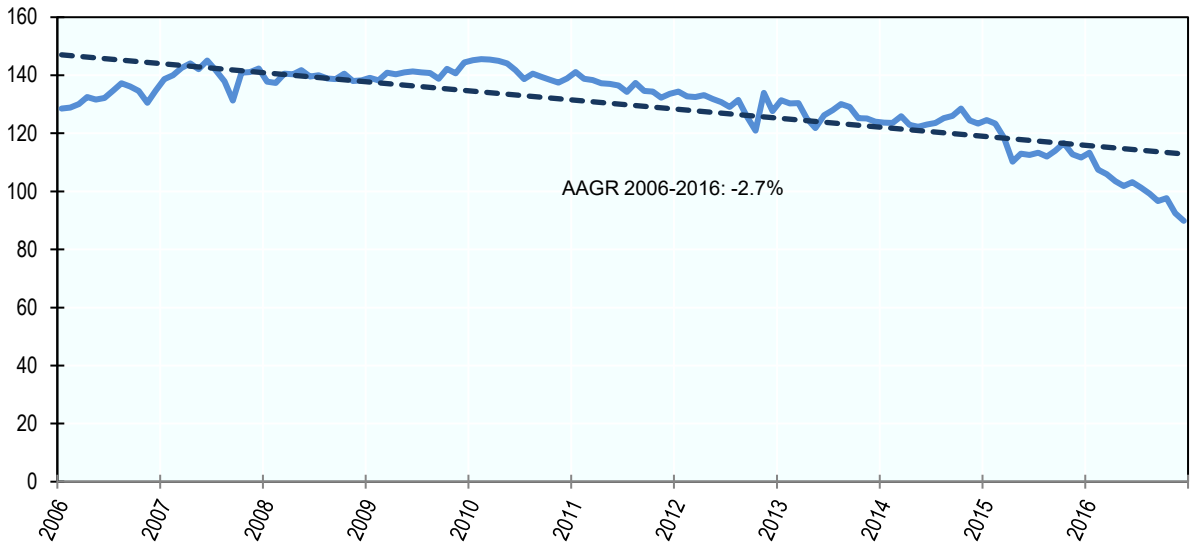
2.1.2.2.1 Natural gas

After extraction, natural gas is cleaned using complex industrial processes to remove impurities and various non-methane hydrocarbons and fluids to obtain dry gas or commercial natural gas.[37] This processing consists of two main stages. First, all impurities – sulphides and most of the water vapour, carbon dioxide, and nitrogen – are removed. This stage is known as gas sweetening and dehydration. The second stage involves the separation of natural gas liquids (NGL),[38] which are then fractioned into individual products, such as methane, ethane, propane, butane, isobutene, and natural gasoline. Only methane can be commercially marketed as natural gas.

SENER is responsible for issuing, modifying and revoking natural-gas processing permits, as well as supervising all activities in this field. Until 2014, processing of sour gas was performed exclusively in PEMEX's gas-processing complexes and refineries. In late 2015, SENER issued and published in the Federal Official Gazette (Diario Oficial de la Federación, DOF) two directives to guarantee that the permit-granting process would be transparent and efficient.[39] Theoretically, any company may now obtain permission from SENER to process natural gas.[40] Yet, as of January 2018, no authorisation had been granted to a private processing company.[41]

Figure 2.4 shows dry natural-gas production – i.e. after processing – between January 2006 and December 2016, measured in million cubic metres per day (mcmpd). Daily production of natural gas steadily declined during this period from an average of 132.7 mcmpd in 2006 to 115 mcmpd in 2016 (the average annual growth rate during this period was -2.7%).

Figure 2.4. Dry natural-gas production, January 2006-December 2016 (mcmpd)



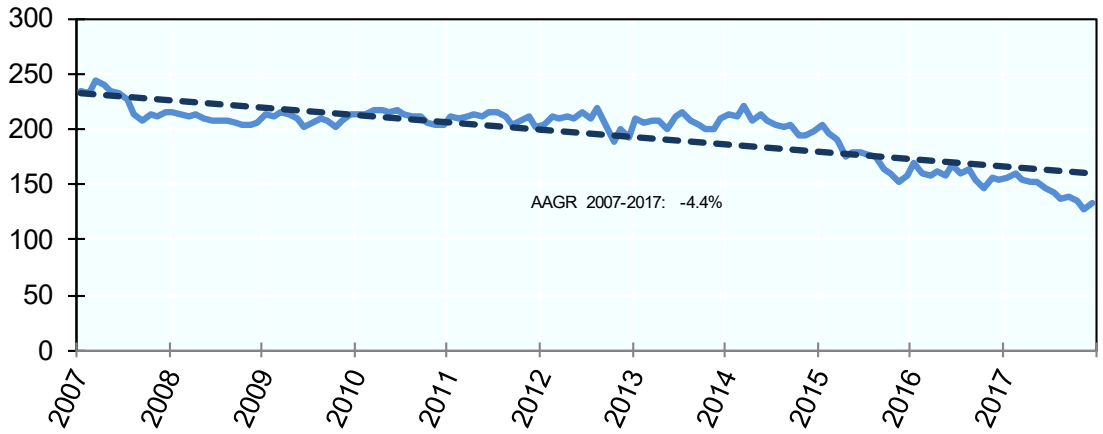
Source: Servicio de Información Energética, Instituto Mexicano del Petróleo, "Balance de Gas Natural Seco", http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGNAT_PSP (accessed14 August 2018).

2.1.2.2.2 LPG

Liquid petroleum gas (LPG) is a by-product of the processing of natural gas or the refining of crude oil.[42] Before the 2013 reform, PEMEX was the only company allowed to process LPG, but theoretically, any company can now process it. As of September 2018, however, PEMEX through its subsidiary PEMEX Transformación Industrial (PEMEX TRI) remains the only LPG producer in Mexico.[43]

Figure 2.5 shows total LPG production in Mexico between January 2007 and December 2017, measured in thousands of barrels per day (tbpd). Average production of LPG a day declined at an average annual growth rate of -4.4%, from 225.76 tbpd in 2007 to 144.62 tbpd in 2017.

Figure 2.5. Production of LPG (tbpd), January 2007-December 2017



Source: "Balance Nacional de Gas L.P.", Servicio de Información Energética, Instituto Mexicano del Petróleo, http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGLP_PSP (accessed on 14 August 2018).

2.1.2.3 Storage and transportation

After processing, gas needs to be transported and stored.

2.1.2.3.1 Natural gas

Transportation includes the entry of natural gas into the pipeline system, its carriage to a different point, as well as all additional activities necessary to carry out this delivery, such as the measurement of its quality and quantity. As of October 2018, Mexico had a network made up of 15 986 kilometres of active natural-gas transmission pipelines.[44]

Storage comprises the entry of natural gas into a storage facility, the measurement of its quality and quantity, and its eventual mixing, as well as all necessary additional activities. Natural gas is usually stored in underground formations – such as former oil or natural-gas fields and aquifers or specially constructed salt caverns – or in aboveground tanks in a liquefied form to increase its energy content to volume ratio. The conditions for gas storage are determined by the Terms and Conditions for the Provision of Services (Términos y Condiciones para la Prestación de los Servicios, TCPS), published by CENAGAS.[45] As of October 2018, Mexico had only three regasification terminals, which are equipped with tanks with minimal storage capacity: Manzanillo (Pacific coast), Ensenada (Pacific coast) and Altamira (Atlantic coast).[46] These three facilities have the capacity to store just 2.4 days of demand; the OECD average is 83 days.[47] According to CENAGAS, Mexico has simply not developed storage facilities; one consequence of this is that Mexico's gas supply is mainly imported from the United States through pipelines.

Two government authorities supervise transport and storage of gas activities: the Energy Regulatory Commission (Comisión Reguladora de Energía, CRE) and CENAGAS. While CRE grants permits for the transport and storage of gas, CENAGAS allocates capacity for the facilities through auctions.[48]

SISTRANGAS

The largest part of Mexico's 15 986 kilometres of natural-gas pipelines is the Integrated Natural Gas Transportation and Storage System (Sistema de Transporte y Almacenamiento Nacional Integrado de Gas Natural, SISTRANGAS), Mexico's natural-gas pipeline grid, which includes transportation pipelines and storage facilities for natural gas, as well as compression, decompression and regasification equipment. In September 2017, SISTRANGAS had a total length of 10 068 kilometres with a total transportation capacity of 5 830 mcfpd at 24 injection points (physical points where processors, producers, and importers can inject natural gas) and 112 extraction points (specific geographical hubs for invoicing purposes).[49]

SISTRANGAS consists of a central, as well as six peripheral, systems:[50]

- The National Gas Pipeline System (Sistema Nacional de Gasoductos, SNG) is the central system within SISTRANGAS; it is 8 867 kilometres[51] long with a capacity of more than 5 000 mcfpd.[52] It is managed by the National Centre for the Control of Natural Gas (Centro Nacional de Control del Gas Natural, CENAGAS).
- The peripheral systems are physically linked to the SNG but otherwise independent;[53] they are operated by private companies.[54]

Until the 2013 reform, PEMEX owned around 88% of SISTRANGAS's total capacity and 86% of its total length,[55] namely, the SNG and the so called Naco-Hermosillo system (located in Sonora, 339.7 km of pipelines receiving gas from the US and not currently linked to the SNG but still publicly owned).[56] In February 2015, however, PEMEX was obliged to transfer the transport permits for the SNG and the Naco-Hermosillo system to CENAGAS,[57] which took over the management of those systems. SISTRANGAS is now owned by the state, private companies and PEMEX.

Figure 2.6. Natural gas infrastructure

Source: SENER (2018), "Mercados de Gas natural" presentation, (25 October 2018).

Access to SISTRANGAS

Since transport pipelines and storage facilities are often natural monopolies, the 2013 reform recognised the need to regulate third-party access to transport and storage services, as well as terms and conditions, such as fees and prices. Holders of a permit for transport or storage must, subject to available system capacity, grant open access to the infrastructure. They also have an obligation to publish relevant information on available infrastructure.

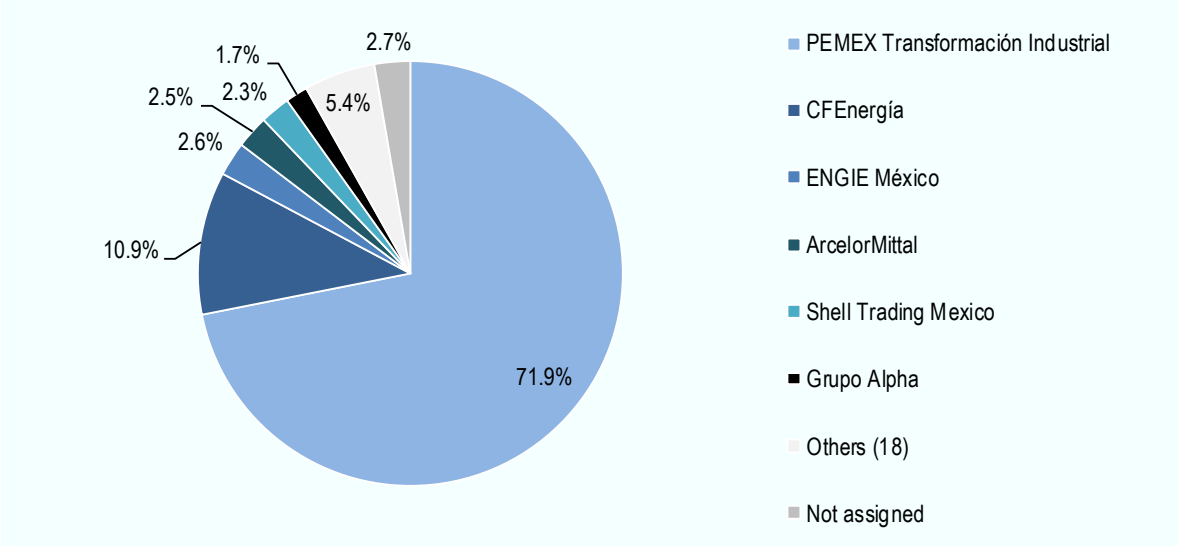
In addition, the reform required the separation (known as "unbundling") of the transport and commercialisation of natural-gas activities to avoid possible conflicts of interest, such as a transport company also commercialising gas competing with other gas distributors or retailers and so having an interest in refusing competitors access to transport capacity. Transportation permit holders cannot commercialise natural gas that passes through their own infrastructure,[58] while companies that offer natural-gas transport and storage services must keep accounting separation.[59] In fact, companies that offer natural-gas transport or storage services are barred from selling natural gas themselves, unless the gas has been transported or stored in case of an emergency, an unforeseen event or a force majeure.[60]

Market participants for transport and storage

Both SPEs and private companies can offer and provide transport and storage services. Since 1995, private companies have been able to apply to CRE for permits to store and distribute natural gas after first-hand sales (*ventas de primera mano*, VPM).[61] If a permit is granted, private companies are allowed to build, operate and own facilities to develop those activities. This means that they can receive and measure natural gas at a point of the system, verify its quality and transport it through pipelines belonging to a "specific trajectory". Permit holders must provide open access to their system to other users.[62] As of October 2018, four firms had been granted permits for the storage of natural gas,[63] while 54 had been granted open-access permits for the transport of natural gas,[64] and 141 companies had own-use transport permits,[65] allowing them to receive, transport and deliver the natural gas they use.[66] Fifteen firms had permits for transport by means other than pipelines,[67] such as tankers, semi-trailer trucks, tanker trucks or tanker wagons, depending on the specific permit.[68]

Market participants generally acquire transport and storage capacities through auctions or "open seasons", organised by CENAGAS. In autumn 2016, CENAGAS assigned 97% of SISTRANGAS's transportation capacity for one year from July 2017 with possibility of renewal if contractors applied three months before their contracts ended. In April 2018, 75% of the total applications that CENAGAS received were for a one-year renewal. The capacities were allocated to PEMEX, the Federal Electricity Commission (Comisión Federal de Electricidad, CFE), ENGIE México, ArcelorMittal, Shell Trading Mexico, Grupo Alpha, Compañías Mexicana de Gas, Macquarie Energy México and IGASAMEX Bajío. In total, PEMEX TRI was awarded 71.9% of SISTRANGAS's total capacity.[69]

Figure 2.7. Allocation of SISTRANGAS capacities, open season 2016-2017



Source: SENER (2017e), 5to informe de labores 2016-2017, p. 39, http://archivos.diputados.gob.mx/Comisiones_LXIII/energia/5toInformeSENER.pdf (accessed on 24 July 2018) and CENAGAS, "Lista de resultados de la Temporada Abierta 2016-2017", www.gob.mx/cenagas/acciones-y-programas/resultados-106203 (accessed on 24 July 2018).

SISTRANGAS users that acquire transport or storage capacity may resell their excess capacity through auctions; this creates a secondary market for transport and storage capacities.[70]

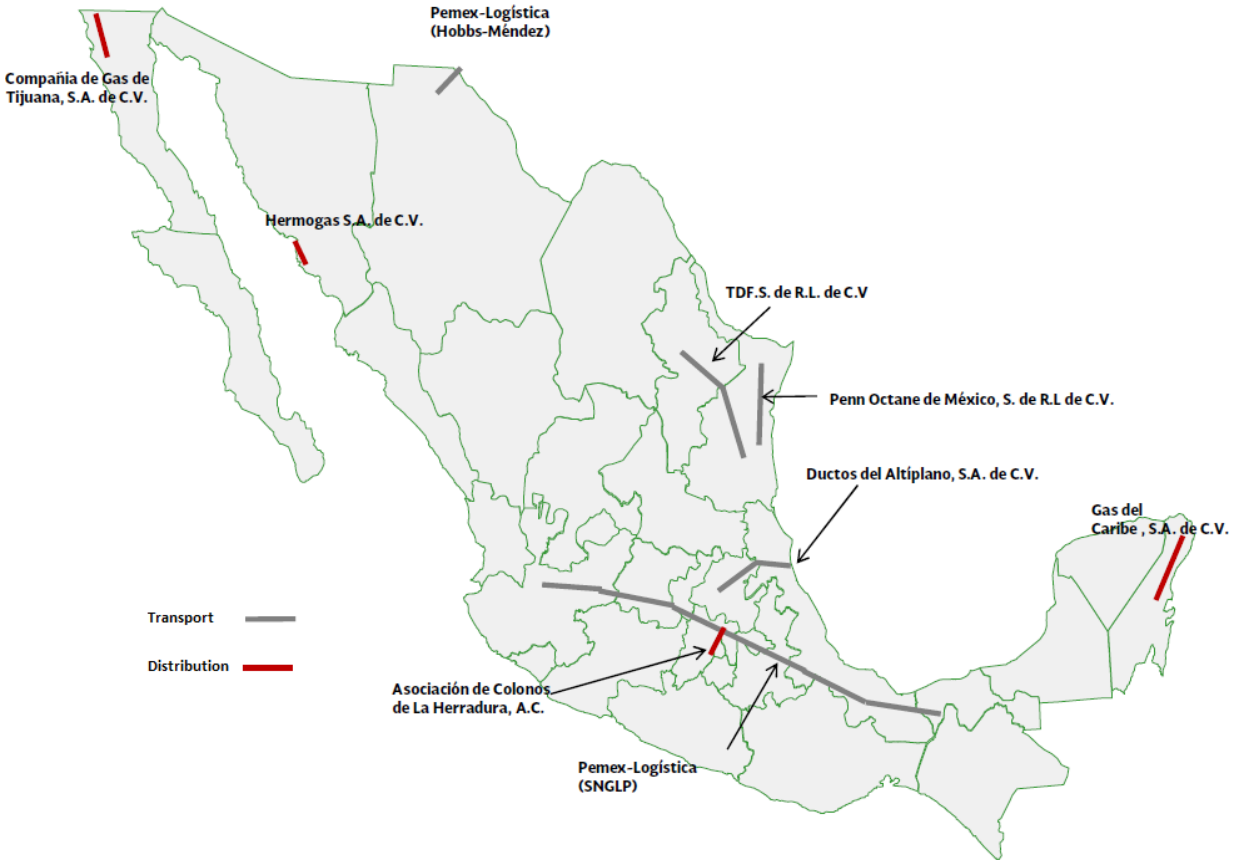
Other systems

CFE is currently constructing gas pipelines as part of a wider strategy to substitute expensive and more highly polluting fuels for cheaper and less environmentally harmful fuels such as natural gas. According to its 2016 Annual Report, CFE had 26 gas-infrastructure projects developing gas pipelines of a total length of 7 234 km and a total capacity of almost 623 thousand mcmpd.[71] Among these projects, four are already in operation: i) Sásabe-Guaymas, operated by Gasoducto de Aguaprieta; ii) Tamazunchale-El Sauz, operated by Transportadora de Gas Natural de la Huasteca (Transcanada); ii) Corredor Chihuahua, operated by Taraumara Pipeline; iv) Gasoducto Morelos, operated by Elecnor, Gasoducto de Morelos.[72]

2.1.2.3.2 LPG

In Mexico, the LPG pipeline system and storage facilities are separate to those for natural gas. This is partly because, while natural gas is exclusively transported through pipelines, LPG is also transported by tanker trucks (i.e. motor vehicles carrying one or more non-demountable containers) and ship. Pipeline infrastructure for LPG is depicted in Figure 2.8.

Figure 2.8. LPG transport and distribution infrastructure

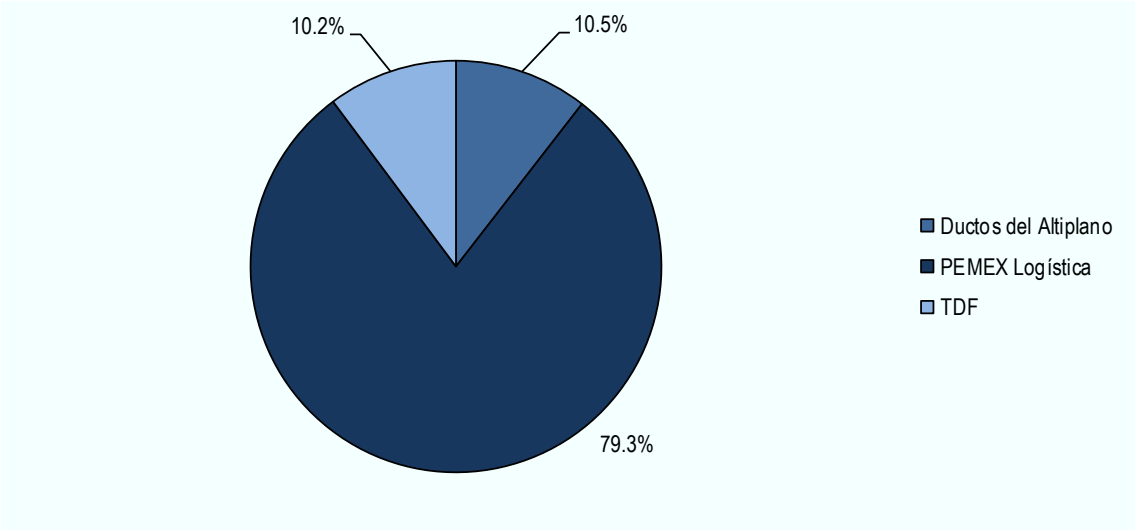


Source: SENER (2016c), Prospectiva de gas L.P. 2016-2030, p.25, www.gob.mx/cms/uploads/attachment/file/177623/Prospectiva_de_Gas_LP.pdf (accessed on 24 July 2018).

To be transported from refineries to storage facilities, LPG has first to be compressed and cooled so that it condenses and liquefies. According to SENER, an average of 283 tbpd of LPG was transported daily in 2015: 54% in tanker trucks, 44% through pipelines belonging either to private companies or PEMEX subsidiary PEMEX Gas and Petroquímica Básica, and 2% on ships.[73]

Figure 9 shows the companies holding permits to transport LPG through pipelines as of 16 July 2018:[74] PEMEX Logística has a total transport capacity of 41.97 million litres; Ductos del Altiplano a total of 5.56 million litres; and TDF 5.41 million litres.[75]

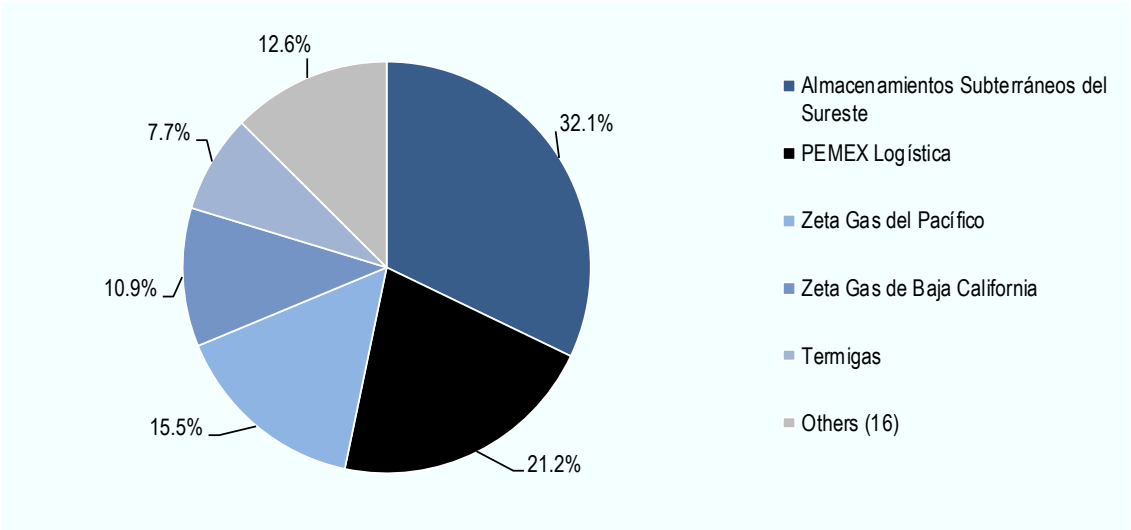
Figure 2.9. Capacity shares for LPG transport through pipelines



Source: www.gob.mx/cms/uploads/attachment/file/345744/Transporte_de_Gas_Licuado_de_Petr_leo_por_medio_de_ductos.pdf (accessed on 27 July 2018)

LPG can be stored in underground caverns or refrigerated tanks from where it is usually moved to bulk loading facilities (large facilities for storing LPG at customers' premises) or to an LPG cylinder-filling plant. As of 16 July 2018, 20 companies had LPG storage permits in Mexico; the largest were Almacenamientos Subterráneos del Sureste; PEMEX Logística; Zeta Gas del Pacífico; Zeta Gas de Baja California; and Termigas. Together these five companies held 87.4% of total storage capacity, as shown in Figure 2.10.

Figure 2.10. Capacity shares in LPG storage



Source: www.gob.mx/cms/uploads/attachment/file/345746/Almacenamiento_de_Gas_Licuado_de_Petr_leo.pdf (accessed on 27 July 2018)

2.1.2.4 Distribution

Distributors are wholesalers that buy natural gas or LPG, usually from PEMEX or other private companies, and sell it to retailers, and sometimes, directly to end users. Often distributors also act as transport providers meaning that a same company can transport, store and distribute gas.

2.1.2.4.1 Natural gas

To distribute natural gas, a company needs a permit from CRE, which is granted for a specific facility (for distribution through pipelines and tanker truck)[76] and a certain capacity. CRE may conduct tenders to grant such permits.

As of December 2016, there were 23 permit holders to distribute natural gas through pipelines,[77] serving 3.3 million users through distribution pipelines totalling 67 918 kilometres. (These *distribution* pipelines, mostly owned by private distributors, are not to be confused with transport pipelines.) The main distributors, by gigacalorie (gcal) capacity,[78] were: Gas Natural México (Monterrey) with a national share of 20.4%; Consorcio Mexi-Gas with 11.7%; Gas Natural del Noroeste (Valle Cuautitlán-Texcoco-Hidalgo) with 11.9%; Gas Natural México (Bajío) with 6.3%; Tractebel Digaqro with 5.4%; and Comercializadora Metrogas with 5.3%.

Most users of natural gas in Mexico are located in the Northeast and Centre regions, which include cities including Monterrey, Mexico City, Juárez, Chihuahua and Saltillo. In Mexico City, however, natural gas is used as a fuel in some homes, but penetration is low in comparison with cities in the Northeast region. According to authorities in the sector, more natural-gas infrastructure needs to be developed in certain cities, but this capacity building is influenced by the ease or difficulty of obtaining natural gas because, as shown below, a significant share of supply comes from the United States.

Table 2.2. Main distributors of natural gas by volume (gcal), 2016

Region	Company	Natural gas (gcal)	Million cubic metres (mcf)*	National share	Regional share
Northeast	Gas Natural México (Monterrey)	23 788 392	2 652.7	20.4%	49.4%
Centre	Gas Natural del Noroeste (Valle Cuautitlán-Texcoco-Hidalgo)	13 855 074	1 545.0	11.9%	30.2%
Centre	Consorcio Mexi-Gas	13 661 813	1 523.5	11.7%	29.7%
Centre – West	Gas Natural México (Bajío)	7 364 582	821.2	6.3%	37.5%
Centre – West	Tractebel Digaqro	6 325 705	705.4	5.4%	32.2%
Centre	Comercializadora Metrogas	6 202 230	691.6	5.3%	13.5%

Note: *OECD estimates with conversion factors from www.gob.mx/cms/uploads/attachment/file/116104/Factores_de_Conversi_n-Gas_Natural.pdf (accessed on 19 July 2018).
Source: SENER (2017a), Prospectiva de gas natural 2017-2031, www.gob.mx/cms/uploads/attachment/file/286233/Prospectiva_de_Gas_Natural_2017.pdf (accessed on 24 July 2018).

According to CRE's website, as of 19 July 2018, there were six permit holders for the distribution of natural gas through means other than pipelines (i.e. tanker trucks): Corporación CH4; Diversenergy México; Solensa; Combustibles Alternos Sustentables; Eco Gas Natural Vehicular; and Natgas Queretaro.[79]

2.1.2.4.2 LPG

For the distribution of LPG, three types of permits are granted by CRE:

- Distribution of LPG through plants (*distribución de gas licuado de petróleo mediante planta de distribución*). LPG is distributed from a plant with access to LPG storage facilities. Distribution can be through portable containers or cylinders to retailers or directly to households or on trucks to factories or service stations. As of 16 July 2018, CRE had granted 1 184 permits for LPG distribution through plants to 538 companies. The three firms with the largest distribution capacity were Gas Express Nieto, with a total capacity of 17.78 million litres; Sonigas with a total capacity of 16.44 million litres; and Gas Menguc with a total capacity of 7.75 million litres.[80]
- Distribution of LPG through pipelines (*distribución de gas licuado de petróleo por medio de ductos*). LPG is transported to retailers, large facilities such as factories or even directly to end consumers through pipelines. As of 16 July 2018, distribution of LPG through pipelines was carried out by three companies:[81] Compañía de Gas de Tijuana, with a total capacity of 187.42 million litres; Gas del Caribe with a total capacity of 179.51 million litres, and Asociación de Colonos de la Herradura with a total capacity of 43.27 million litres.
- Distribution of LPG through tanker trucks (*distribución de gas licuado de petróleo por medio de auto-tanques*). A distributor with this permit does not need to own a plant – which is the case for the distribution of LPG through plants permit – only tanker trucks. As of 16 July 2018, only one company (Petreos de Metepec, Hidalgo) holds a permit to distribute LPG through tanker trucks.[82]

Before the energy reform, distributors had to buy LPG from PEMEX. Since 2016, private companies have been able to produce LPG or import it,[83] mainly from the United States, using ship, train or truck transport or through pipelines.[84] Importation of LPG is subject to a permit from SENER and the consent of the Ministry of Economy. As of 16 May 2018, SENER had granted 108 permits for the import of LPG.[85] In 2016, 54.7% of domestic consumption was imported LPG.

2.1.2.5 Retail

Retail activities are not to be confused with commercialisation activities, which are a wider category and dealt with below. According to the 2014 Regulation on the Activities Referred to by the Third Title of the Hydrocarbons Law (Reglamento de las actividades a que se refiere el Título Tercero de la Ley de Hidrocarburos), commercialisation includes retail, as well as the managing or contracting of transport services, storage or distribution, and the provision of other value-added services.

Distribution and retail of LPG are separate activities, according to Mexican law,[86] although in practice distributors can apply for a distribution permit that allows them to sell to end-users.[87] Retailers are only allowed to sell products purchased from a permit holder to final customers.[88]

2.1.2.5.1 Natural gas

Unlike for LGP, distribution and retail of natural gas are not separate activities, as distributors also retail natural gas (see section 2.1.2.4.1).

2.1.2.5.2 LPG

LPG is generally sold to end customers in metal cylinders. These are often costlier than the product they contain and customers generally have to pay a deposit.

LPG can be retailed to end users directly from three different types of facility, each of which requires a separate CRE permit for the retailer. These are:

- **Retail through storage facilities** (*expendio al público mediante bodega de expendio*). A permit to sell LPG directly through storage facilities; it includes the retail sale of LPG in portable cylinders directly to the consumer.[89] As of October 28 2018, there were 13 permitholders to sell LPG through storage facilities. On 16 July 2018, CRE granted the first permit to sell LPG through storage facilities (permit number LP/21394/EXP/BOD/2018) to a retail store (Walmart).
- **Retail through specialised service stations** (*expendio al público mediante estación de servicio*). Retail through service stations is intended for end users with motor vehicles fuelled by LPG.[90] As of 16 July 2018, 766 companies held 3 288 permits related to this activity.[91]
- **Retail through service stations for self-consumption** (*expendio mediante estación de servicio para autoconsumo*). LPG retail through the service stations for self-consumption is intended for permit holders that own motor vehicles fuelled by LPG. Permit holders have to use the LPG themselves (i.e. for their own fleet) and are not allowed to sell it to third parties.[92] As of 16 July 2018, CRE has issued 525 of these permits to 277 companies.[93]

2.1.2.6 Commercialisation

Commercialisation is a term frequently used in Mexican energy legislation. It includes several stages of the value chain and is not limited to retail activities. According to the Regulation on the Activities Referred to by the Third Title of the Hydrocarbons Law, commercialisation includes:

- The purchase and sale of hydrocarbons, petroleum or petrochemicals to users or end users.
- The transportation, storage or distribution of these products to users or end users.
- The provision of value-added services to users or end users in the activities referred to in that Regulation (i.e. oil treatment and refining; natural-gas processing; export and import of hydrocarbons and oil products; transportation, storage, distribution, compression, decompression, liquefaction, regasification, commercialisation and sale to the public of hydrocarbons, oil products and petrochemicals).[94]

2.1.2.6.1. Natural gas

Natural gas can be sold to users by private companies or PEMEX (which, as of September 2018, is the only SPE active in producing natural gas). One of the 2013 energy reform's goals was to incentivise private firms to participate in the natural-gas business. For that purpose, the Mexican government introduced so-called asymmetrical regulation, the Gas Release Programme (Programa de Cesión de Contratos, PCC).[95] With the goal of limiting PEMEX's dominance, increasing private firms' market participation, and intensifying overall competition, PEMEX was made subject to strict regulation and monitoring requirements that other private companies do not have to fulfil. According to the PCC,

PEMEX also has to release 70% of its portfolio of contracts related to commercialisation activities to other private participants by 2020.[96] Once the market counts more participants (although the law does say how many), this asymmetrical regulation will be lifted.[97]

By October 2017, CRE said that 32.16% of PEMEX's portfolio volume had been released.[98]

2.1.2.6.2. LPG

CRE had issued 84 permits to 84 companies for the commercialisation of LPG by October 2017.[99]

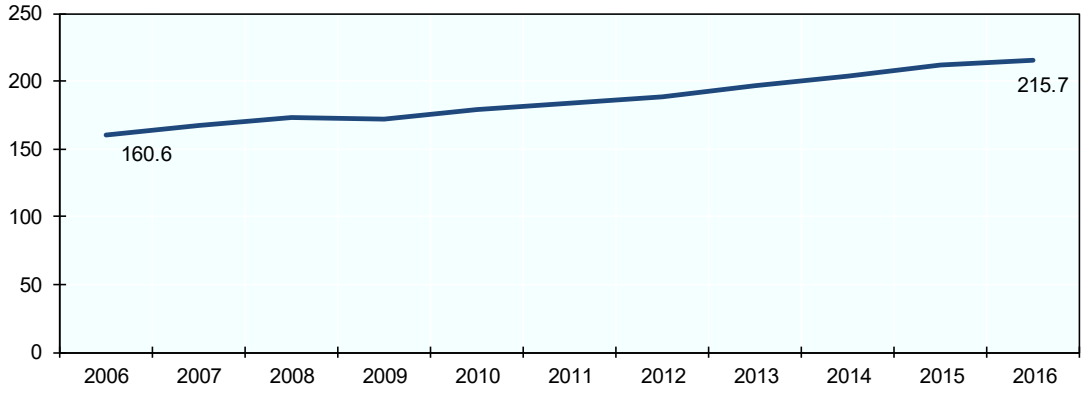
2.1.3. Demand

In 2015, national Mexican demand for fossil fuels amounted to 17 115 mcfpd of equivalent natural gas. Demand for natural gas accounted for 43.8% (212.5 mcmpd) of the total demand for fossil fuels, while LPG accounted for 6.3% (30.5 mcmpd).[100] The remainder was made up of gasoline (22.3%); diesel (12.7%); fuel oil (6.3%); and petroleum coke (2.6%).

2.1.3.1 Natural gas

Demand for natural gas in Mexico steadily increased in the period 2006-2016. As seen in Figure 2.11, total demand increased at an average annual growth rate (AAGR) of 3%, from 160.6 mcmpd in 2006 to 215.7 mcmpd in 2016. This growth in demand, according to the International Energy Agency (IEA), has largely been driven by a rapid increase in the use of natural gas in electricity generation.[101]

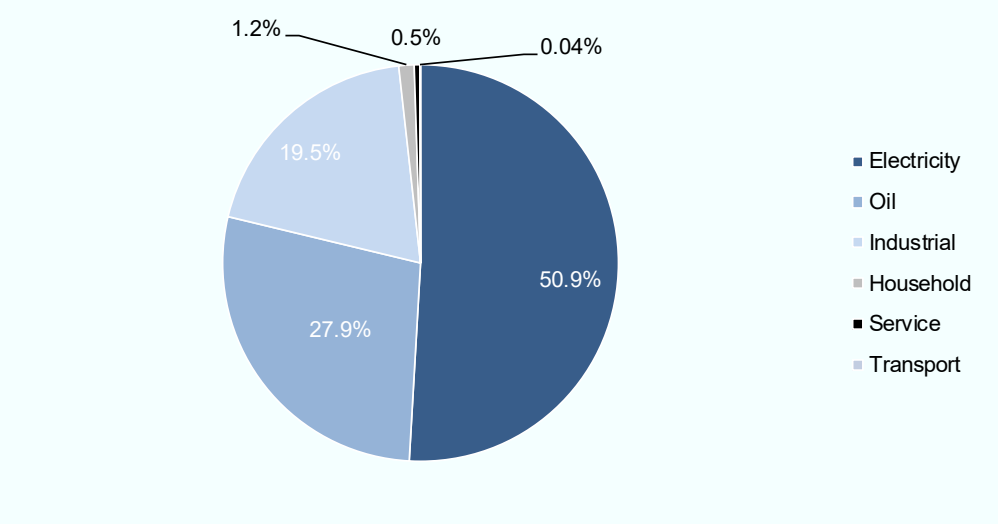
Figure 2.11. Natural-gas demand, 2006-2016 (mcmpd)



Source: Servicio de Información Energética, Instituto Mexicano del Petróleo, "Balance de Gas Natural Seco", http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGNAT_PSP (accessed 14 August 2018).

Buyers of natural gas by sector in 2016 are shown in Figure 2.12. The electricity-generation sector had the highest demand share with 109.8 mcmpd (50.9%), followed by the oil sector with 60.1 mcmpd (27.9%), the industrial sector (19.5%), with 42 mcmpd, and the household sector, with 2.7 mcmpd (1.2%).

Figure 2.12. Demand for natural gas by sector, 2016



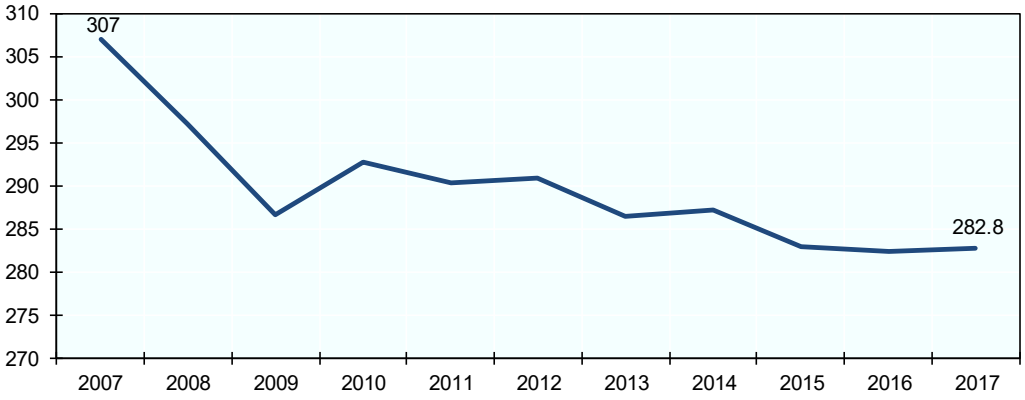
Source: Servicio de Información Energética, Instituto Mexicano del Petróleo, "Balance de Gas Natural Seco", http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGNAT_PSP (accessed 14 August 2018).

2.1.3.2 LPG

LPG is mostly sold to households in cylinders and from tanker trucks and used for cooking and heating water, as well as for domestic heaters. According to INEGI's 2016 National Survey of Household Income and Expenditure, 85% of households bought LPG in cylinders and 15% through tanker trucks. The use of LPG in the industrial sector remains low.[102]

As a result of an increasing preference for natural gas, the demand for LPG continues to decline. Between 2007 and 2017, it fell an average 0.8% from 307 tbpd in 2007 to 282.8 tbpd in 2017 as shown in Figure 13.

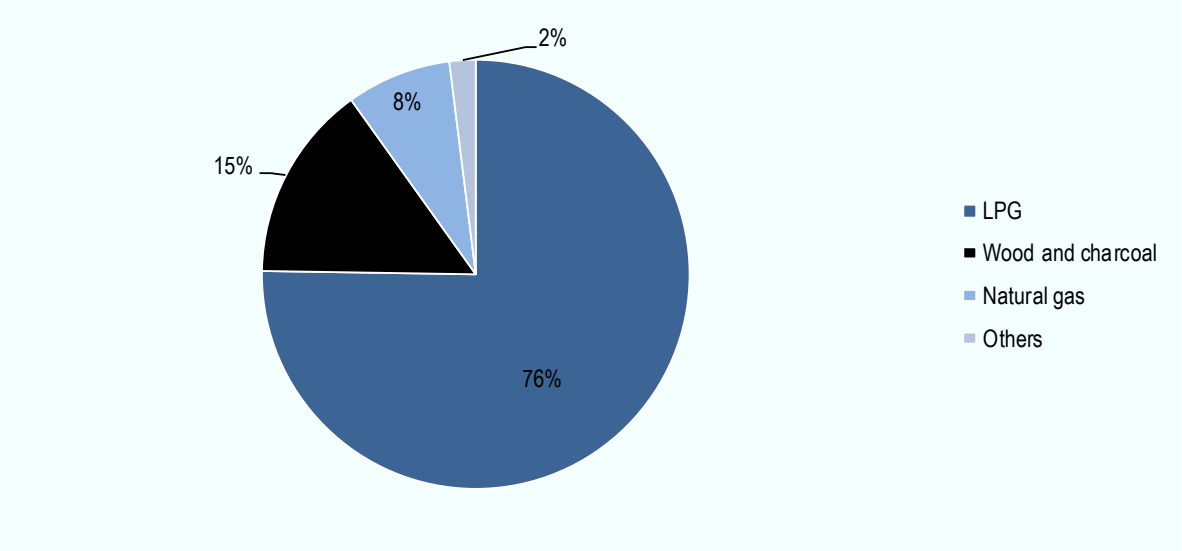
Figure 2.13. LPG demand, 2007-2017 (thousand barrels per day)



Source: Servicio de Información Energética, Instituto Mexicano del Petróleo, "Balance Nacional de Gas L.P.", http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGLP_PSP (accessed 14 August 2018).

However, as shown in Figure 2.14, LPG still remains by far the most commonly used fuel for cooking. In 2016, more than three quarters of households used LPG, against only 8% for natural gas.

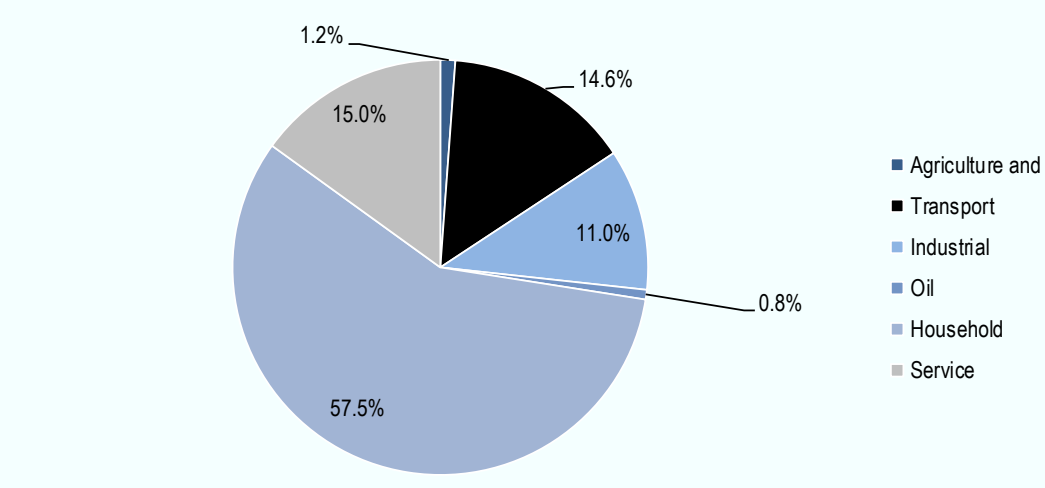
Figure 2.14. Distribution of household fuel usage for cooking, 2016



Source: INEGI (2016), Encuesta Nacional de Ingresos y Gastos de los Hogares 2016, http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGNAT_PSP (accessed on 23 July 2018).

Demand for LPG by sector is shown in Figure 2.15. In 2017, the household sector had the highest share of demand with 162.59 tbpd (57.5%), followed by the service sector (such as restaurants that use LPG for cooking equipment) with 42.51 tbpd (15.0%); the transport sector with 41.17 tbpd (14.6%); and the industrial sector with 31.14 tbpd (11%).

Figure 2.15. Demand for LPG by sector, 2017



Source: Servicio de Información Energética, Instituto Mexicano del Petróleo, "Balance Nacional de Gas L.P.", http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGLP_PSP (accessed on 14 August 2018).

2.1.4. Price Regulation

In Mexico, retail prices for natural gas were regulated until June 2017 and for LPG until December 2016, since when prices have been market-based. This change did not affect so-called VPM sales of LPG, which are the first transfer of hydrocarbons made in Mexico either by PEMEX or another SPE to a third party. These prices remain subject to CRE regulation.

2.1.4.1 Natural gas

Currently, natural-gas prices are fully market-based.[103] Before July 2017, VPM prices for natural gas were regulated according to a pre-set methodology.[104] Since then, however, CRE has been generating and publishing a national reference index of wholesale natural-gas prices (Índice de Referencia Nacional de Precios de Gas Natural al Mayoreo, IPGN), which consists of the average price of all natural-gas transactions carried out in the Mexican market.

Figure 2.16 shows VPM and end-user average prices per gigajoule (GJ) prior to market liberalisation and the IPGN after the July 2017 liberalisation. While VPM prices before liberalisation increased at an average monthly growth rate of 0.53% between January 2012 and June 2017 (with end-user prices increasing at an average monthly growth rate of 0.62% during the same period), after liberalisation, from July 2017 to March 2018, average wholesale natural-gas prices decreased at an average monthly growth rate of 0.11%, passing from MXN 69.4 per GJ in July 2017 to MXN 68.9 in March 2018. In January 2017, end-user prices for natural gas were liberalised.

Figure 2.16. Prices (MXN/GJ) for natural gas (prior to liberalisation), January 2012-March 2018

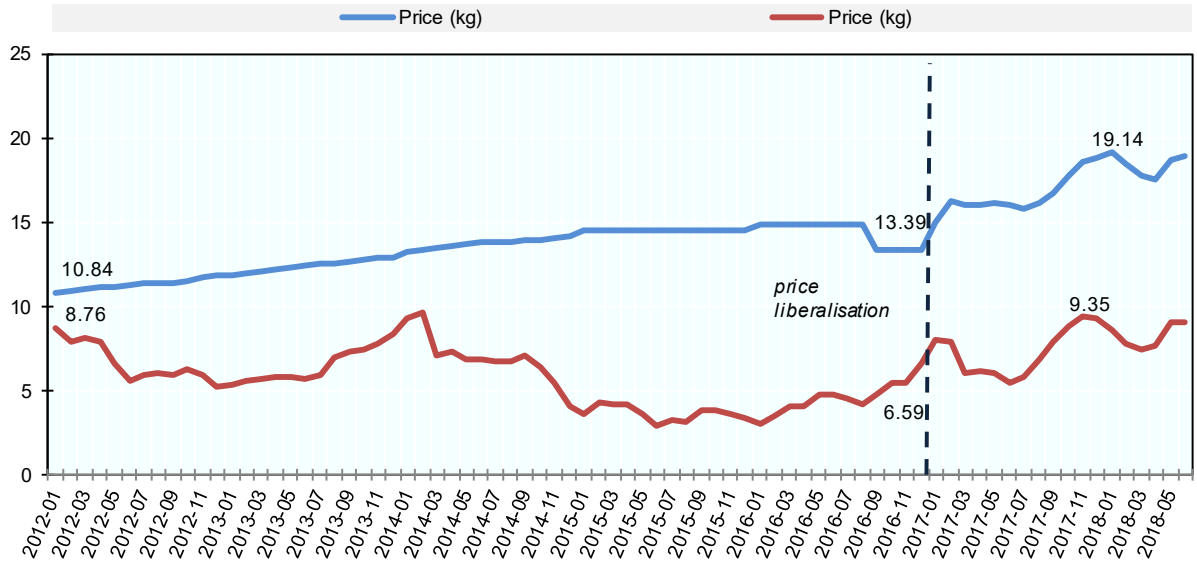
Source: CRE, "Precios de Gas Natural: Usuarios Finales" "Índice de Referencia de precios de gas Natural al Mayoreo" and "Precios Máximos de Gas Natural Objeto de Venta de Primera Mano", https://datos.gob.mx/busca/dataset/precios-maximos-de-gas-natural-objeto-de-venta-de-primera-mano and https://datos.gob.mx/busca/dataset/indice-de-referencia-nacional-de-precios-de-gas-natural-al-mayoreo (accessed on 18 September 2018).

2.1.4.2 LPG

Price regulation for LPG has also been liberalised and been market-based since January 2017,[105] with the exception of VPM sales.[106] After liberalisation, average end-user price has shown a steep upward trend, increasing by a total 40% between December 2016 and December 2017. In December 2016, the then-regulated end-user price for a kilogramme of LPG was MXN 13.39; by the end of 2017, the market-based price had reached MXN 18.82.

The industry explains these LPG price rises by the increase in Mont Belvieu, TX, propane spot price FOB, which also rose by a total 40% between December 2016 and December 2017, passing from MXN 6.59 a kilogramme in December 2016 to MXN 9.26 in December 2017.[107]

Figure 2.17. End-user average prices for LPG and Mont Belvieu, TX, propane spot prices FOB (MXN/kg), January 2012-June 2018*



Note: * LPG average prices for 2017 and 2018 were estimated with LPG cylinder prices reported to CRE by distributors.
Source: PEMEX, "Precio al público de productos petrolíferos", www.pemex.com/ri/Publicaciones/Indicadores%20Petroleros/epublico_esp.pdf (accessed on 24 July 2018); DOF, agreements setting LPG maximum prices for end users, January 2012-December 2014; CRE, "Historial de precios promedio al público de gas LP reportados por los distribuidores", www.gob.mx/cre/documentos/historial-de-precios-promedio-al-publico-de-gas-lp-reportados-por-los-distribuidores?state=published (accessed on 24 July 2018); US Energy Information Administration, "Mont Belvieu, TX, Propane Spot Price FOB", www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=eer_epllpa_pf4_y44mb_dpg&f=w.

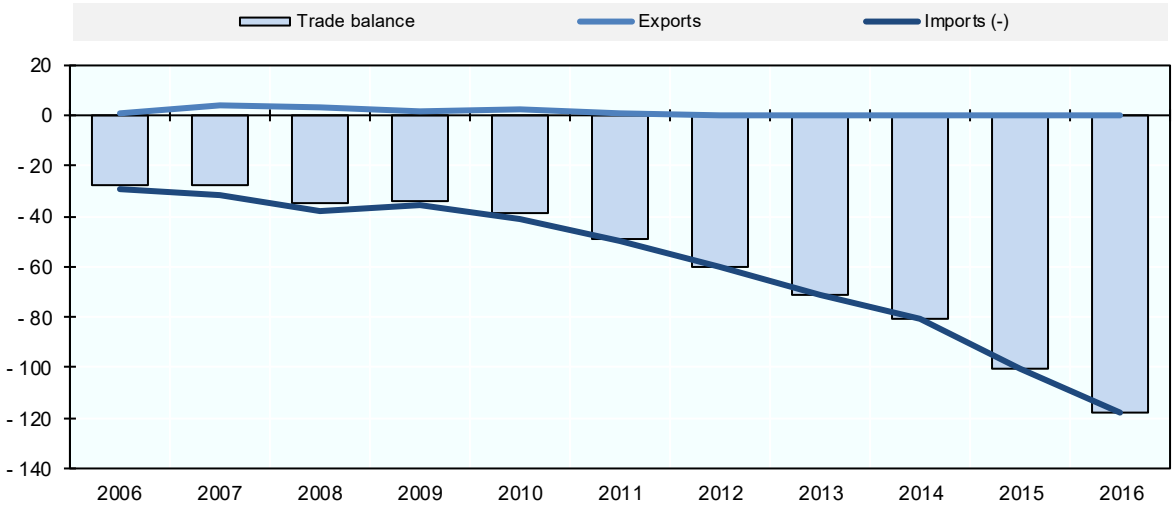
2.1.5. International trade

Mexico has been a net importer of natural gas by volume traded since 1985, and of LPG since 1975 (except for the period 1988-1991).[108] Its dependency on imports has increased over recent years.

2.1.5.1 Natural gas

Between 2006 and 2016, the volume of imports of natural gas grew at 15.7% AAGR, while exports decreased at a rate of 23.8%, resulting in a persistently negative trade balance for natural gas in Mexico.

Figure 2.18. Imports and exports of natural gas (million cubic metres per day), 2006-2016



Source: Sistema de Información Energética, Instituto Mexicano del Petróleo, "Balance de Gas Natural Seco", http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGNAT_PSP (accessed 14 August 2018).

The vast majority of imported natural gas arrives in Mexico through cross-border pipelines (82% of total imports in 2015).[109] In 2017, 94.4% of Mexico's imported natural gas in terms of value came from the United States. By volume, imports made up more than 99%,[110] with gas arriving from, among other countries, Nigeria (2.6% by value), Trinidad and Tobago (1.6%), and Peru (0.8%).[111]

Table 2.3. Natural-gas imports (litres) by country of origin (2017) by volume

Country	Imports (litres)	Share (%)
United States	784 697 184 991	99.990%
Nigeria	2 225 613 506	0.005%
Peru	755 202 000	0.002%
Trinidad and Tobago	659 304 956	0.002%
Indonesia	392 972 000	0.001%
Total	**788 851 906 153***	**100%**

Note: *Import quantities shown do not add up the total due to other imports smaller than 0.001% not included in the table.
Source: Tariff codes 2711.11.01 and 2711.21.01 of the Online Tariff Information System (Sistema de Información Arancelaria Vía Internet, SIAVI), www.economia-snci.gob.mx (accessed on 20 July 2018).

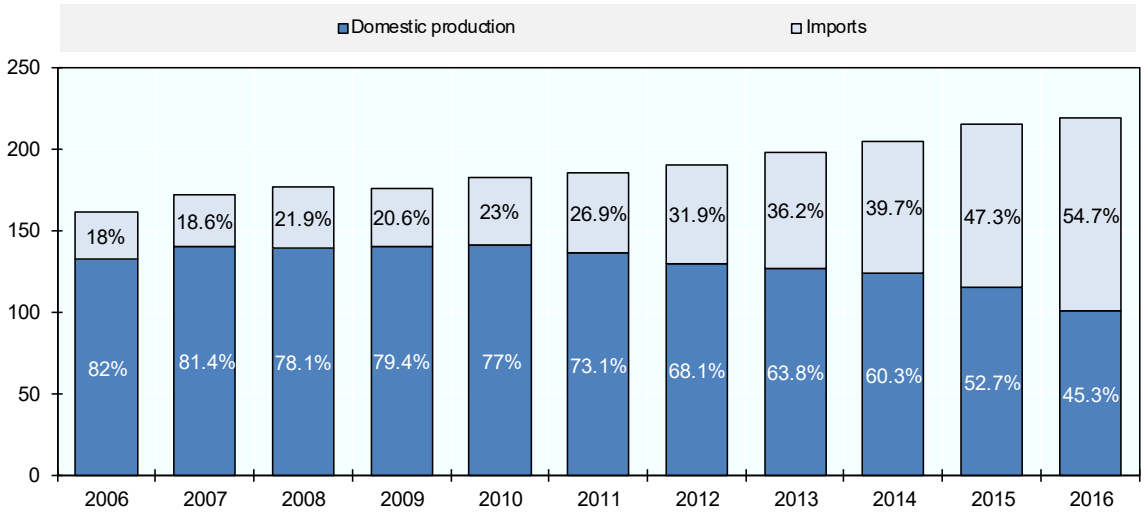
Table 2.4. Natural-gas imports (USD) by country of origin (2017) by value

Country	Imports (USD)	Share (%)
United States	962 795 682	74%
Nigeria	158 742 855	12%
Trinidad and Tobago	97 550 646	7%
Peru	48 357 579	4%
Equatorial Guinea	22 232 451	2%
Total	**1 307 638 662***	**100%**

Note: *Import quantities shown do not add up the total due to other imports smaller than 0.001% not included in the table.
Source: Tariff codes 2711.11.01 and 2711.21.01 of SIAVI, www.economia-snci.gob.mx (accessed on 20 July 2018).

As a consequence, the share of imported natural gas used for domestic consumption steadily increased from 18% in 2006 to 54.7% in 2016.

Figure 2.19. Domestic consumption of natural gas (mcmpd), 2006-2016

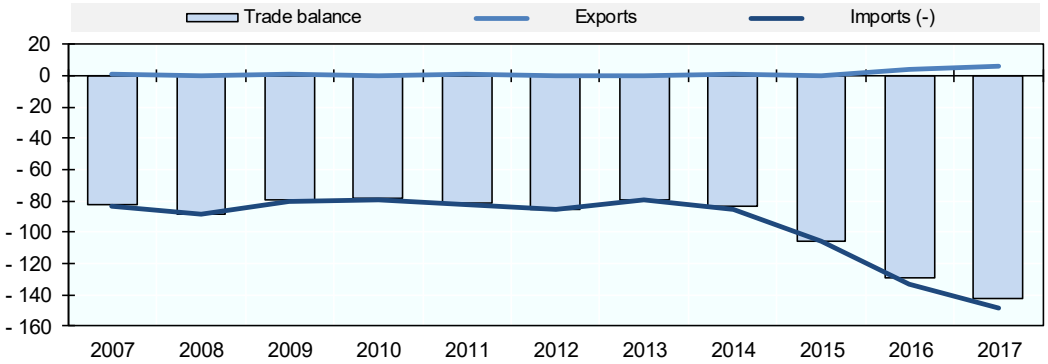


Source: Sistema de Información Energética, Instituto Mexicano del Petróleo, "Balance de Gas Natural Seco" http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGNAT_PSP (accessed on 14 August 2018).

2.1.5.2 LPG

Mexico is a net importer of LPG (butane and propane, mixed and liquefied). Between 2007 and 2017, the volume of imports grew at 6% AAGR, while exports grew at a rate of 18.7%, but as import volume was on average 744.7 times higher than exports, this resulted in a persistent negative LPG trade balance for Mexico and a growing dependency on imports.

Figure 2.20. Imports and exports of LPG (thousand barrels per day), 2007-2017



Source: Sistema de Información Energética, Instituto Mexicano del Petróleo, "Balance Nacional de Gas L.P.", http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGLP_PSP (accessed on 14 August 2018).

LPG is almost exclusively imported into Mexico from the United States. In 2017, the US share of imports was 92.29% in terms of volume and 92.55% in terms of value.

Table 2.5. LPG imports (litres) by country of origin (2017)

Country	Imports (litres)	Share (%)*
United States	1 874 884 585	92.292%
Canada	156 566 553	7.707%
Total	**2 031 467 833***	**100%**

Note: *Share percentage does not add up to 100% due to other imports smaller than 0.001% not included in the table.
Source: SIAVI tariff code 2711.19.01, www.economia-snci.gob.mx (accessed on 19 July 2018).

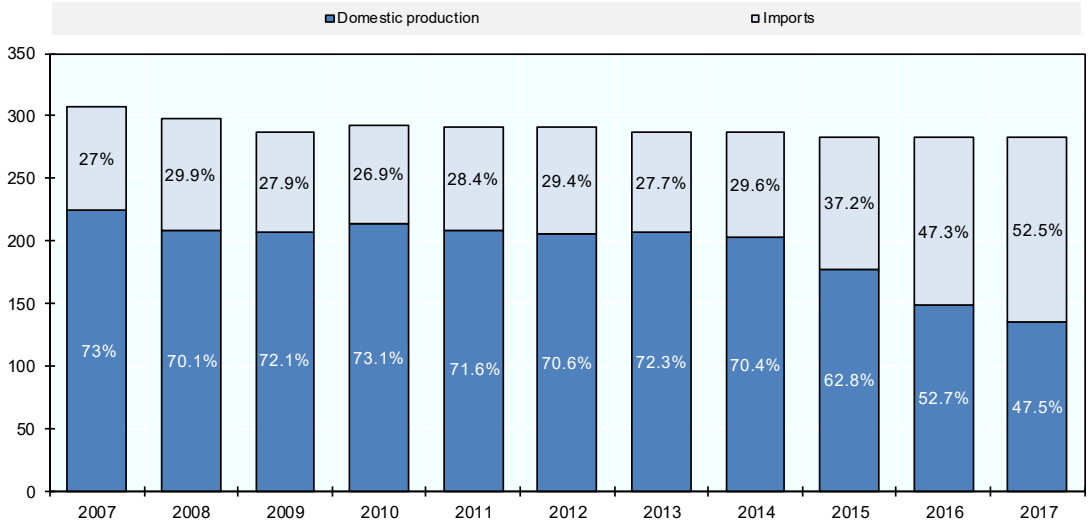
Table 2.6. LPG imports (USD) by country of origin (2017)

Country	Imports (USD)	Share (%)*
United States	478 716 619	92.553%
Canada	38 486 962	7.441%
Total	**517 235 229***	**100%**

Note: *Share percentage does not add up to 100% due to other imports smaller than 0.004% not included in the table.
Source: Source: SIAVI tariff code 2711.19.01, www.economia-snci.gob.mx (accessed on 19 July 2018).

From 2006 to 2014, the share of imported LPG in domestic consumption remained generally consistent between 24.3% and 29.9% (with total consumption falling as discussed above). However, in 2015, this share increased to 37.2% in 2015 and 52.5% in 2017.

Figure 2.21. Domestic consumption of LPG (tbpd)



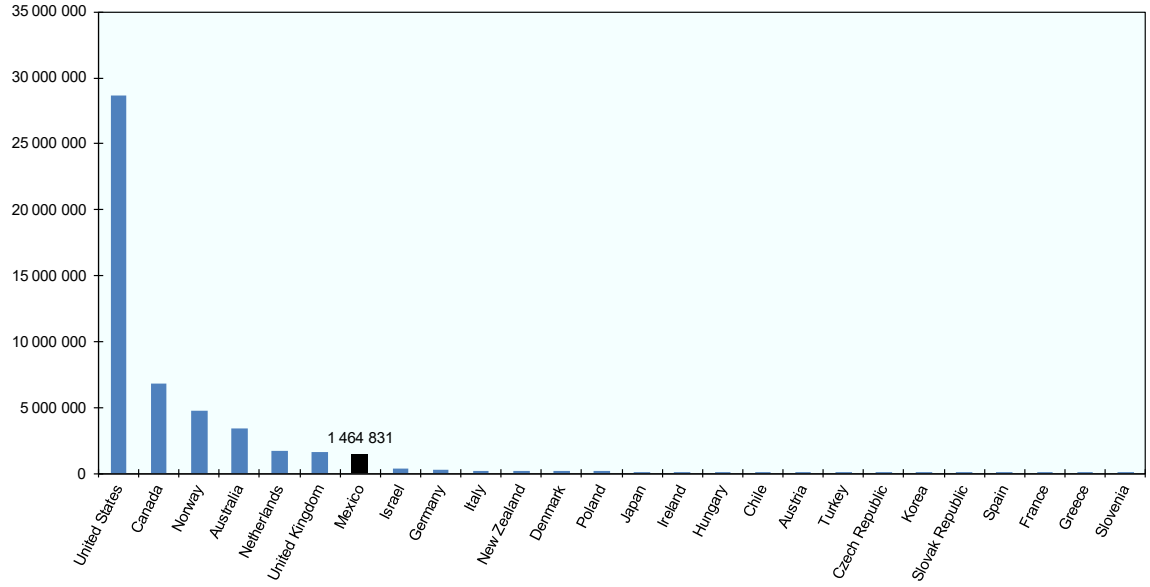
Source: Sistema de Información Energética, Instituto Mexicano del Petróleo, "Balance Nacional de Gas L.P.", http://sie.energia.gob.mx/bdiController.do?action=cuadro&cvecua=BGLP_PSP (accessed on 14 August 2018).

2.1.6. International comparisons

2.1.6.1 Natural gas

In 2016, according to IEA statistics, Mexico ranked seventh for natural-gas production among OECD countries, with 1.465 million terajoules (TJ), after the United States (28.671 million TJ); Canada (6.780 million TJ); Norway (4.762 million TJ); Australia (3.441 million TJ); the Netherlands (1.678 million TJ); and the United Kingdom (1.664 million TJ).

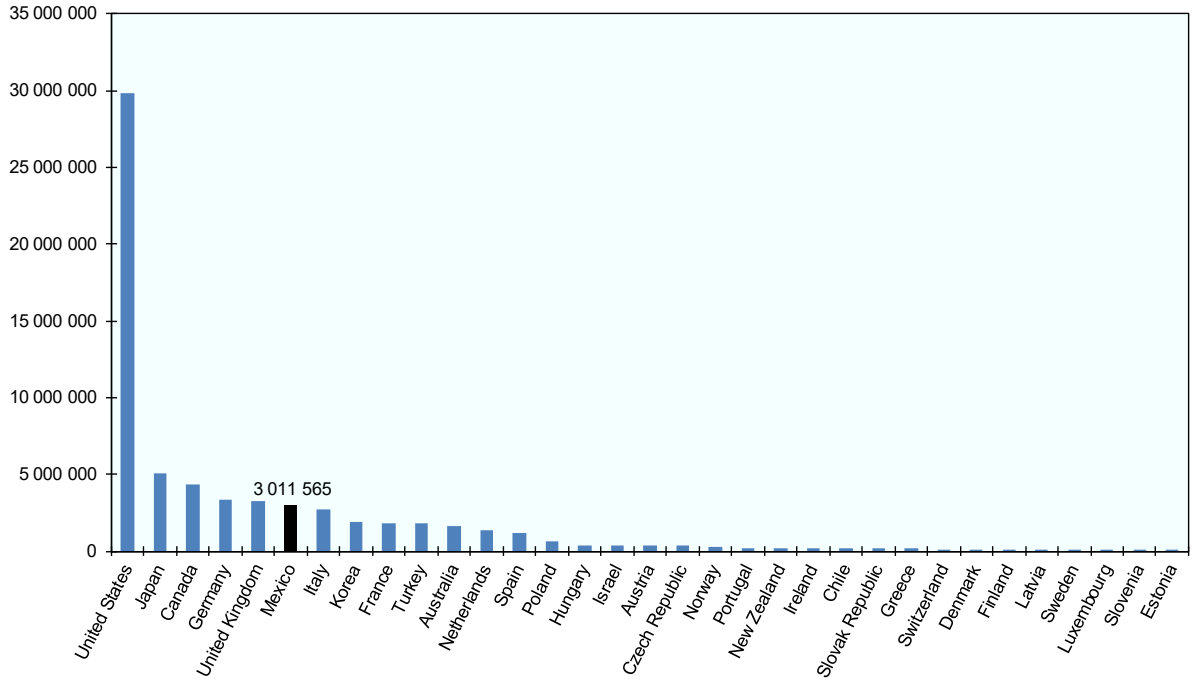
Figure 2.22. Natural gas production across OECD countries (TJ), 2016*



Note: *Figures for natural gas reported in IEA publications may be different from those reported in Mexican energy publications, as IEA includes only dry gas and excludes natural-gas liquids, which it considers as part of oil. Data for 2016 is preliminary.
Source: OECD/IEA (2017), World Energy Statistics, p. III.17.

In terms of natural-gas consumption among OECD countries in 2016, Mexico ranked sixth at 3.012 million TJ, after the United States (29.796 million TJ); Japan (5.098 million TJ); Canada (4.362 million TJ); Germany (3.336 million TJ); and the United Kingdom (3.229 million TJ). In 2016, overall consumption in Mexico was twice its production volume.

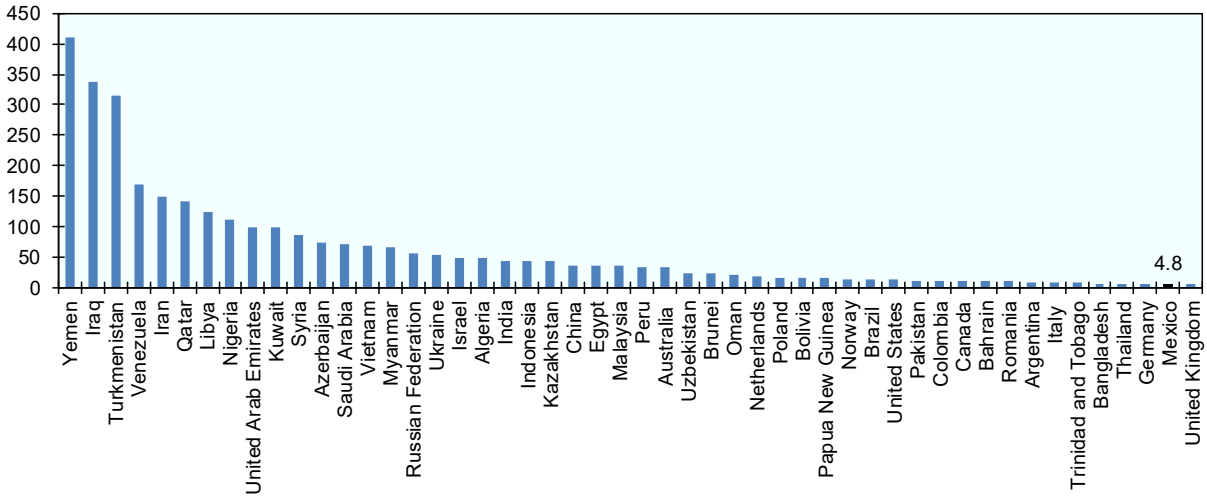
Figure 2.23. Natural gas consumption across OECD countries (TJ), 2016*



Note: *Figures for natural gas reported in IEA publications may be different from those reported in Mexican energy publications, as IEA includes only dry gas and excludes natural-gas liquids, which it considers part of oil. Data for 2016 is preliminary.
Source: OECD/IEA (2017), Natural Gas Information, p. III.10.

The June 2018 *BP Statistical Review of World Energy* compares reserves-to-production (R/P) ratios among countries and found that Mexico's natural gas R/P ratio is among the lowest worldwide, with a value of 4.8 years. In contrast, the average world R/P ratio is equal to 52.6 years.[112]

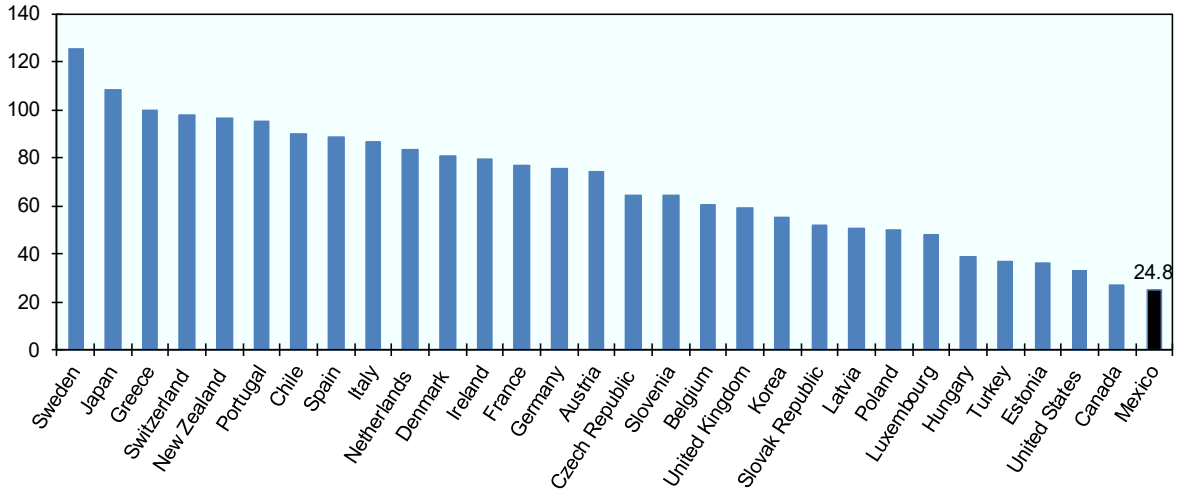
Figure 2.24. World natural-gas R/P ratios, 2017



Source: BP Statistical Review of World Energy, June 2018, p.26, www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf, (accessed on 19 July 2018).

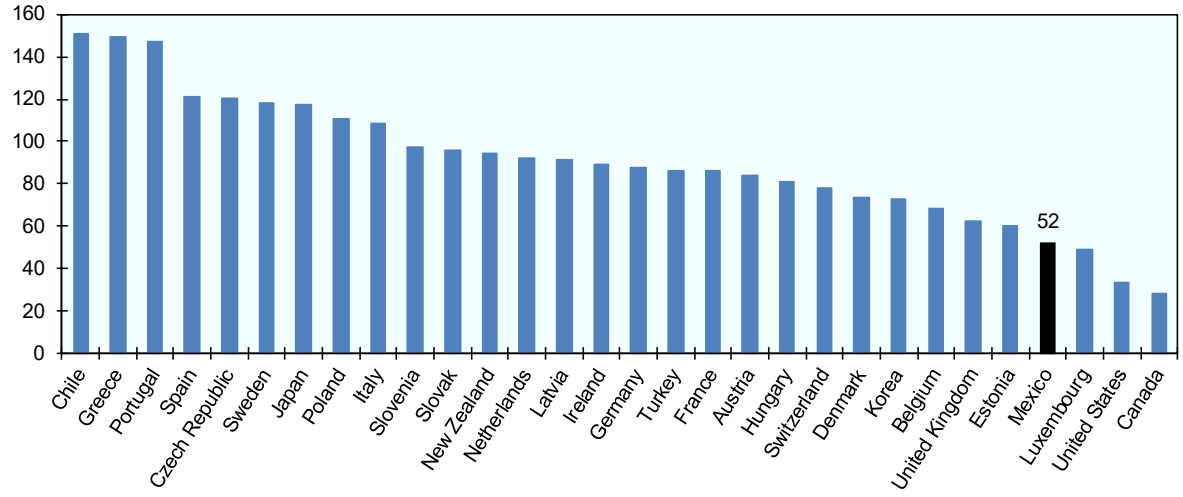
In 2016, according to IEA statistics, Mexico's natural-gas prices for households ranked among the lowest of all OECD countries. However, when corrected for purchasing power parity (PPP), they remain higher than prices in Canada and the United States.

Figure 2.25. Household natural-gas prices (USD per megawatt hour, MWh), uncorrected for PPP, 2016



Source: OECD/IEA (2018), Energy Prices and Taxes 2018, Q2, p.343.

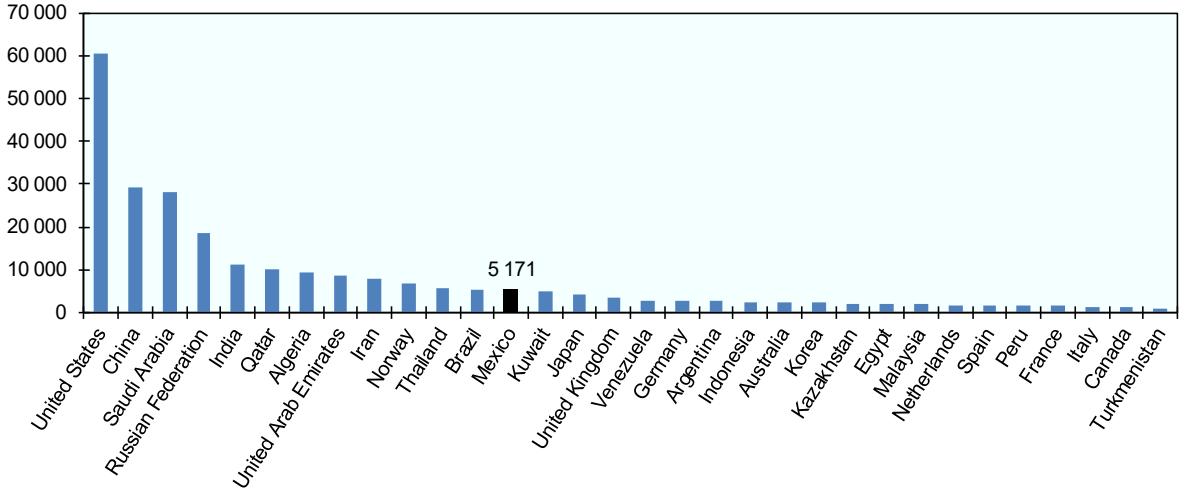
Figure 2.26. Household natural-gas prices (USD/MWh), corrected for PPP, 2016



Source: OECD/IEA (2018), Energy Prices and Taxes 2018, Q2, p.385.

In 2015, according to energy statistics from the United Nations, Mexico was the 13th-largest global LPG producer with a production of 5 171 thousand metric tonnes (tmt). The top five producers in 2015 were the United States (60 554 tmt); China (29 344 tmt); Saudi Arabia (28 220 tmt); the Russian Federation (18 622 tmt); and India (11 057 tmt).

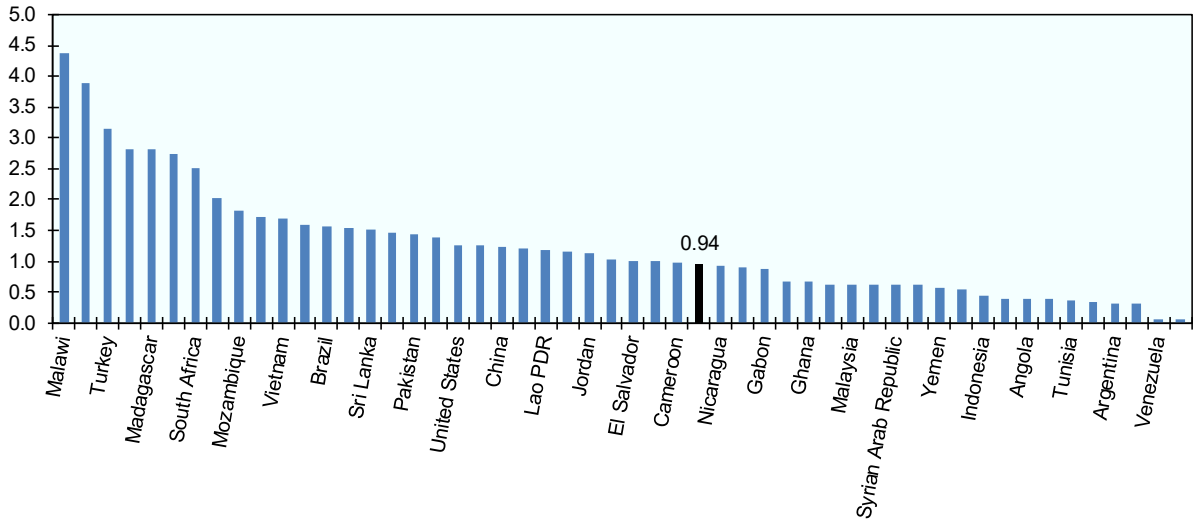
Figure 2.27. LPG production (thousand metric tons), top producers, 2015



Source: UN (2015), Energy Statistics Yearbook, https://unstats.un.org/unsd/energy/yearbook/2015/t17.pdf (accessed on 19 July 2018).

According to Kojima (2013), Mexico's retail prices for LPG ranked close to the median of 1.015 when compared to LPG prices among a group of 52 developing countries.

Figure 2.28. LPG retail prices in January 2013 (USD/kg)



Source: Kojima (2013), *Reforming Fuel Pricing in an Age of $100 Oil*, World Bank, Washington DC, https://openknowledge.worldbank.org/handle/10986/16524 (accessed on 19 July 2018).

2.1.7. Relevant authorities and associations

2.1.7.1. Authorities

Ministry of Energy (Secretaría de Energía, SENER)

The Ministry of Energy is the main body responsibly for energy policy in Mexico. Its tasks include guaranteeing the national supply of fuels, including natural gas and LPG, as well as open access to import pipelines (*ductos de internación*), the infrastructure that connects Mexico with the transport and storage infrastructure for natural-gas importation.

SENER is also responsible for granting and revoking "assignments" (*asignaciones*) to SPEs, with the approval of the National Hydrocarbons Commission (Comisión Nacional de Hidrocarburos, CNH), allowing SPEs to explore and extract hydrocarbons.[113] SENER designs the technical guidelines for tender processes when an SPE decides to migrate from an assignment to a contract (i.e. decides to carry out extraction or exploration activities in partnership with a private company and subcontracts some of its activities in a tender process through service contracts).[114] Finally, SENER grants permits for oil treatment and refining (of which LPG is a side product), and the processing of natural gas,[115] as well as for import and exports of various gas products, such as LNG.[116]

SENER co-operates closely with the National Centre for Control of Natural Gas (Centro Nacional de Control del Gas Natural, CENAGAS),[117] as well as with CRE and CNH through the Energy Sector Coordination Council (Consejo de Coordinación del Sector Energético), a body including the minister of energy and three sub-secretaries of SENER, the presidents of CRE and CNH, as well as both director generals of CENEGAS and the National Centre for Control of Energy (Centro Nacional de Control de Energía, CENACE).[118]

National Hydrocarbons Commission (Comisión Nacional de Hidrocarburos, CNH)

CNH is the "upstream regulator" in the hydrocarbons sector and regulates and supervises the surface exploration and the extraction of hydrocarbons. It also quantifies reserves, as well as prospective and contingent resources.[119]

CNH prepares tenders and signs contracts for the exploration and extraction of hydrocarbons; administers, in technical matters, the assignments and contracts for the exploration and extraction of hydrocarbons, and provides technical advice to SENER regarding contractual issues. Through the National Hydrocarbon Information Centre (Centro Nacional de Información de Hidrocarburos, CNIH), CNH processes and updates the information obtained from exploration or extraction activities.

CNH has its own legal status, as well as management and operational autonomy.[120] Its board of commissioners is selected by the Mexican Senate. CNH is currently funded through resources from the federal budget, but also has its own income, such as fees charged for the supervision of exploration and extraction of hydrocarbons.[121] In 2017, CNH had almost 400 employees.[122]

Energy Regulatory Commission (Comisión Reguladora de Energía, CRE)

CRE is responsible for regulating midstream activities in the hydrocarbon sector (i.e. transport, storage, distribution, compression, liquefaction and regasification); downstream activities (i.e. retail); and some activities related to the electricity-generating sector.[123] It issues permits for all these activities, especially for transport, storage, distribution, compression, liquefaction, decompression, regasification, commercialisation, and sale to the public of hydrocarbons, oil products or petrochemicals.

CRE manages the national integrated systems (i.e. the interconnected pipeline transport and storage systems),[124] notably SISTRANGAS and the six peripheral systems,[125] including approving newly created parts of the integrated systems, extra infrastructure, and integrated-systems operators. CRE also has to approve conditions for tenders that CENAGAS carries out for allocating capacity in the natural-gas transportation and storage systems.[126]

Finally, CRE issues Mexican Official Standards (Normas Oficiales Mexicanas, NOM) for the quality specifications of hydrocarbons, oil products and petrochemicals,[127] and has the authority to set the VPM price for LPG.

CRE has technical, operative and management autonomy. It is largely financially independent of the government and funded with fees from the issuance and management of permits.[128] Like CNH, its board of commissioners is selected by the Mexican Senate. As of December 2017, CRE had more than 500 employees, of whom 59 were involved in the LPG or natural-gas sectors.[129]

National Centre for Control of Natural Gas (Centro Nacional de Control del Gas Natural, CENAGAS)

CENAGAS is the operator of the gas distribution and transmission systems, responsible for managing and administering SISTRANGAS. Its aim is to ensure continuity and security of supply. CENAGAS also carries out tender procedures to allocate SISTRANGAS capacity rights and supervises permit-holder operations in order to protect open access and capacity reserves.

At the end of 2015, the Mexican government decided that PEMEX should cede ownership of the Naco-Hermosillo system and the SNG to CENAGAS. The gradual takeover began on 1 January 2016, but a lack of resources during 2016 saw CENAGAS subcontract the necessary services to operate and maintain this infrastructure from PEMEX.[130] As of September 2018, the system was being operated by CENAGAS.

CENAGAS is a decentralised public body, with its own legal status, as well as budgetary autonomy. It is supervised, however, by SENER so that its actions have to remain in line with federal-government strategy.[131] In June 2017, CENAGAS had around 270 employees.[132]

Ministry of Economy (Secretaría de Economía, SE)

For SENER to grant permits for the import and export of butane, propane and their blending, and for the export of natural gas, it has to consult the Ministry of Economy (SE) through the General Directorate of Light Industries (Dirección General de Industrias Ligeras). The General Directorate then assesses whether the national offer is sufficient to meet national demand, which is one of the permit requirements. For its assessment, the General Directorate can consult SPEs, trade associations and other government bodies.

Various provisions in Mexican energy legislation require authorities, SPEs and even private companies to buy Mexican products, so called "national content", for projects concerning exploration and extraction of hydrocarbons. The SE, in collaboration with SENER, is responsible for setting a methodology to define and measure this national content.

Agency for Safety, Energy and Environment (Agencia de Seguridad, Energía y Ambiente, ASEA)

ASEA is an administrative body with technical and managerial autonomy that reports to the Mexican Ministry of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales, SEMARNAT*). It regulates and supervises activities and facilities related to the hydrocarbons industry in order to protect the environment and guarantee industrial safety. It also oversees the decommissioning of facilities. In 2017, ASEA had around 460 employees.[133]

Co-ordinated Assistance Office for the Energy Sector (Oficina de Asistencia Coordinada del Sector Energético, ODAC)

ASEA, CRE and CNH created the Energy Sector Co-ordinated Assistance Office in order to provide advice on the applications that companies must present before the three authorities, such as the approval of exploration and extraction plans, approval of well drilling, retail of LPG, and the transport of natural gas through pipelines.[134]

Ministry of Finance and Public Credit (Secretaría de Hacienda y Crédito Público, SHCP)

SHCP is in charge of setting the fiscal and economic terms and conditions of contracts for the exploration and extraction of hydrocarbons in accordance with the Hydrocarbons Revenue Law (Ley de Ingresos sobre Hidrocarburos). Together with SENER and CNH, SHCP is responsibility for publishing monthly figures on oil revenues and payments made to contractors.

Mexican Petroleum Institute (Instituto Mexicano del Petróleo, IMP)

IMP is a public research institution for the oil industry that provides technical goods and services such as research and human-resources training. It was created in 1965 to support PEMEX, but now aims to provide technical assistance to the whole industry. Since January 2018, IMP also works as a verification unit to evaluate the design, building, operation and maintenance of service stations for diesel and gasoline. On 30 June 2017, IMP had 2 602 employees.[135]

2.1.7.2 Trade associations

Mexican Association of Hydrocarbons Companies (Asociación Mexicana de Empresas de Hidrocarburos, AMEXHI)

AMEXHI is a non-profit trade body that aims to bring together investors and oil and gas operators at all levels of the value chain. Founded in 2015, it currently has about 50 industry members from 19 different countries,[136] including Ecopetrol, ExxonMobil, PEMEX, Shell and Petrobras, which are responsible for 24.15% of global natural-gas production.[137]

Mexican Natural Gas Association (Asociación Mexicana de Gas Natural, AMGN)

AMGN is an industry association promoting the interests of companies active in the natural-gas industry. AMGN members include companies owning or operating infrastructure(s) or commercialising natural gas, providing consulting, goods or services related to the natural-gas industry, and researchers or academics. It was set up in 1988 and currently has more than 80 members.[138]

Association of LPG Distributors, (Asociación de Distribuidores de Gas LP, ADG)

ADG represents around 250 companies that distribute and commercialise LPG. Together, its members distribute around 45% of the LPG consumed in Mexico.

Mexican Association of LPG Distributors (Asociación Mexicana de Distribuidores de Gas LP y Empresas Conexas, AMEXGAS)

AMEXGAS represents LPG distributors to the Mexican authorities. Created in 1962, it currently represents approximately 180 companies.[139]

LPG Inland Distributors Association (Asociación de Distribuidores de Gas LP del Interior, ADIGAS)

Founded in 2008, ADIGAS is an association of LPG distributors. In 2018, it represented 72 Mexican companies from 25 of the 32 Mexican states, which accounted for 17% of the national LPG retail market. Most ADIGAS members are small- and medium-sized companies over 50 years old.[140]

2.2. Overview of the legislation

The regulatory framework applicable to the gas sector in Mexico is extensive. Regulation covers all segments of the vertical production and distribution chain for natural gas and liquid petroleum gas (LPG), including exploration, production, processing, transport,

distribution, wholesale and retail. The mapping of Mexican legislation for the gas sector included 279 pieces of legislation, including federal laws, bylaws, organic statutes (which create an administrative agency and defines its authorities and responsibilities), ministerial decrees, directives, resolutions, administrative dispositions, official standards, guidelines, methodologies and public agreements issued by government entities. Almost 20% of the regulations address natural gas, while approximately 22% deal with LPG. The remaining 58% refer to legislation covering both, general energy regulation and horizontal legislation. Ultimately, the team found 105 prima facie restrictions, for which the OECD has issued 72 recommendations.

The main principles of Mexican energy law are contained in the Mexican Constitution (*Constitución Política de los Estados Unidos Mexicanos*), which was first enacted on 5 February 1917 and was last modified on 27 August 2018 (as of September 2018). Articles 25, 27, and 28 of the Mexican Constitution deal with strategic and priority areas for national development; national ownership of natural resources; the state no longer having a monopoly on the exploration and extraction of hydrocarbons; and Mexico's Co-ordinated Energy Regulators, which arethe National Hydrocarbons Commission, (*Comisión Nacional de Hidrocarburos, CNH*) and the Energy Regulatory Commission (*Comisión Reguladora de Energía, CRE*). These three constitutional articles were extensively modified as a result of the 2013 Energy Reform. Furthermore, Article 115 of the Mexican Constitution deals with municipal autonomy, namely, the right of Mexican municipalities to decide the rules to issue licences and permits for constructions, such as new gas pipelines.

Four pieces of legislation – two laws and two bylaws – can be characterised as the main framework legislation in the energy sector:

- The **Law of the Co-ordinated Regulators on Energy Matters** *(Ley de los Órganos Reguladores Coordinados en Materia Energética*) was first enacted on 11 August 2014 and has not been modified since (as of September 2018). This law regulates the organisation and functioning of CRE and CNH, the Co-ordinated Energy Regulators.
- The **Hydrocarbons Law** (Ley de Hidrocarburos) was enacted on 11 August 2014 as a consequence of the 2013 Energy Reform and was last modified on 15 November 2016. The law implements the relevant articles of the Mexican Constitution with regards to hydrocarbons and covers activities at all levels of the vertical supply chain for natural gas and LPG, from exploration, production, processing, distribution to the retail of hydrocarbons. The law is divided into four titles: general provisions; exploration and extraction of hydrocarbons; other activities in the hydrocarbons industry; and general provisions related to the hydrocarbons industry.
    - Two bylaws to the Hydrocarbons Law were issued by the Mexican government on 31 October 2014.
- The first, **Reglamento de la Ley de Hidrocarburos**, gives details for provisions of the first, second and fourth titles of the Hydrocarbons Law, attaining to general provisions, exploration, extraction, and general questions concerning the hydrocarbons industry (such as penalties, transparency and combating corruption, procedures, jurisdiction, use and surface occupation, social impact, national industry development, industrial safety, and environmental protection).

- The second bylaw, **Reglamento de las actividades a que se refiere el Título Tercero de la Ley de Hidrocarburos**, regulates permits for processing, exports, imports, transport, storage, distribution, wholesale and retail, and the management of integrated systems for transporting gas, as outlined in Title 3 of the Hydrocarbons Law. As of September 2018, neither bylaw has been modified since its introduction.

The main restrictions identified are presented in detail in the following sections.

2.3. Upstream

The upstream gas sector comprises exploration and production, as well as processing of gas. Until 2013, only the Mexican state had the right to extract oil and gas, meaning that Petróleos Mexicanos (PEMEX), the country's 100%-state-owned oil and gas company, had the exclusive rights to explore, exploit, refine and process natural gas. This changed when the 2013 energy reform allowed the Mexican government to grant rights for exploration and extraction of gas.

The OECD team identified 31 restrictive regulations in the upstream sector and made 20 recommendations. These concern the following topics:

- **Procurement**
  - Requirement for private companies to hold tender procedures.
  - Pre-conditions for participating in tenders.
- **Preference for Mexican goods and services**
  - Requirement for assignees and contractors at upstream level to buy a minimum of national content.
  - Requirement of SENER, CNH and CRE to prefer a Mexican offer under "equivalent conditions".
  - Requirement of assignees and contractors to prefer a Mexican offer under "equivalent conditions".
- **Permits and authorisations**
  - Social-impact studies.
  - Registry of Importers.
  - Registration of third parties with CNH.
- **Problems related to PEMEX**
  - Possible conflict of interest within Mexican Institute of Petroleum.
  - Compensation payments to PEMEX.
  - Farmouts.
  - Processing of gas through PEMEX.
  - Asymmetrical regulation.
- **Non-harmonised standards**

2.3.1. Procurement

2.3.1.1. Requirement of private companies to hold tender procedures

Description of the obstacle. For the exploration and extraction of hydrocarbons in Mexican territory, the federal government can either use an assignment to grant areas and their mineral rights to PEMEX or other state productive enterprises (SPEs), or award contracts for hydrocarbon production rights to private companies or SPEs. If an assignee or a contractor subcontracts or makes acquisitions for amounts lower than USD 5 million, the assignee or contractor can use any selection procedure it chooses. If the amount is between USD 5 million and USD 20 million, the assignee or contractor must choose its provider using the "restricted invitation procedure" in which at least three companies are invited to submit offers and the contract is awarded to the best in terms of quality and price. Finally, for amounts over USD 20 million, the assignee or contractor must run a tender procedure. These thresholds apply to both private companies and SPEs, since a contractor can be an SPE or a private company. Additional legislation establishes procurement rules for SPEs.

Harm to competition. The provision establishes regulations on how private companies should contract or purchase goods and services. However, having to run a tender might not always be the most efficient way to choose a supplier. Indeed, the obligation might increase private companies' costs as they are forced to run tender procedures even for comparatively small amounts. Also, the provision limits the freedom of private companies to choose their own suppliers.

Policymakers' objective. The requirement to hold tender procedures even for private parties subcontracting other private companies might be a way to strengthen the competitive process along the value chain as it guarantees smaller companies can be subcontracted, despite not having a commercial relation with larger contractors or assignees. This requirement ensures fair conditions for participation and that the best offer is chosen when subcontracting. There is the danger, however, that subcontracting is used by companies to enter into bid-rigging schemes: one company agrees to withdraw or lose its bid so another company can win, and the winner then reciprocates by subcontracting to the other company. As such, it is good practice to impel contractors to report to CNH any planned subcontracting in their original offer, and then report any subsequent subcontracting, as well as the selection criteria.

Recommendation. The OECD recommends that private companies should be able to select their suppliers freely. They should however, have to report all their subcontracting to CNH in order to detect and prevent collusive agreements between companies that initially competed in the contract tender process (or did not participate due to an agreement). Additionally, the OECD recommends adding a clause to all calls for tenders to require companies to reveal any intention to subcontract and then report any subsequent subcontracting, as well as the selection criteria.

2.3.1.2. Preconditions for participating in tenders

Description of the obstacle. In order to participate in tender procedures for contracts for the exploration and extraction of hydrocarbons, SPEs and private companies must fulfil certain preconditions; these are usually established in the calls for tender. Preconditions vary depending on the type of terrain for which rights are being tendered (e.g. shallow water, deep water, inland) and the type of activity to be carried out. For instance, tenders for terrestrial oil and gas extraction usually have fewer financial requirements (such as net

worth, total investments, and credit rating of a company's assets, both in Mexico and abroad) than tenders for extracting oil and gas in shallow and deep water. A company wanting to participate in a tender needs to prequalify anew for each tender even if it participated in the same year in a tender that had the same or even stricter requirements.

Harm to competition. Several market participants have claimed that preconditions for participating in tenders can be excessive and might increase participation costs.

Policymakers' objective. Ensure that only companies or SPEs able to fulfil contracts are allowed to participate in tender procedures. According to CNH requirements, each tender is case specific and as such needs to be modified accordingly. Conditions change based on the type of terrain being tendered and the type of activity. For instance, for onshore regions, CNH will choose conditions that are easier to fulfil in order to allow smaller companies to participate in the exploration and extraction activities. Since 2018, CNH has been allowing companies that have presented documents in a previous pre-qualification simply to state they have done so rather than having to re-present them. CNH says it is currently working on a registry of pre-qualified participants in order to avoid private companies or SPEs having to incur unnecessary extra costs for re-presentation of documents.

Recommendation. The OECD recommends as much as possible standardising preconditions that private companies and SPEs are required to fulfil in order to participate in tenders for contracts. These standard conditions can then be modified, if necessary, on a case-by-case basis. Furthermore, the OECD suggests introducing a registry for pre-qualified tender participants in order to avoid private companies or SPEs having to prove compliance with the same requirements more than once. These conditions should be regularily verified (e.g. every five years) to ensure that companies continue to be compliant.

2.3.2. Preference for Mexican goods and services

2.3.2.1. Requirement for assignees and contractors at upstream level to buy a minimum of national content

Description of obstacle. The 2013 energy reform establishes that, in order to promote the participation of national enterprises at all levels of the energy-sector value chain, a minimum percentage of national content should be used, including in the exploration and extraction phase. Assignees and contractors have to use a mandatory minimum percentage of national content. The law defines an assignee as an SPE that has been assigned an exploration area; a contractor is an SPE or a private enterprise that has won a contract for exploration and extraction. The average share of national content for these activities was 25% in 2015 and is set to increase gradually to at least 35% by 2025. After 2025, the share of national content will be reviewed by the Ministry of Economy (*Secretaría de Economía, SE*) every five years. The SE, in collaboration with the Ministry of Energy (*Secretaría de Energía, SENER*), has been responsible for establishing a methodology for the measurement of national content in assignments and contracts. According to industry participants, in practice, it is very difficult to keep track of whether a company complies with the regulation on minimum national content since all the suppliers used by exploration and extraction companies (who have their own sub-contractors and, in turn, their sub-contractors) have to be taken into account. Market participants claim to face uncertainty concerning which accountability methodologies to use in order to estimate whether they comply with the requirements of the provision.

Harm to competition. Complying with the minimum national-content requirement, might increase the costs of assignees and contractors as they might have to use more expensive

Mexican products in spite of possibly cheaper or higher-quality foreign products being available. Also, foreign suppliers might suffer discrimination. Finally, companies not being sure about what methodology to use to calculate national content might overfulfil their obligation in order to be sure of acting legally.

Policymakers' objective. The objective of the provision is to support Mexican companies that operate in the hydrocarbons industry. The OECD understands that the SE is in the process of issuing a new simplified "information report" that should clarify the calculation of national content for the industry. All operators will use this report to detail the national content they use.

International comparison. Similar local-content policies (LCP) have been implemented in the oil and gas sectors of countries including Angola, Brazil, Indonesia, Kazakhstan, and Trinidad and Tobago. According to a 2013 World Bank report, *Local Content Policies in the Oil and Gas Sector*, LCP can yield mixed results.[141] While this report does not advocate in favour or against LCP, analysed case studies seem to suggest that certain factors are needed for LCP to be successful in improving the economy, including local companies having basic technological levels, industrial capacity and financial strength, and local markets being competitive. The report suggests that governments interested in implementing LCP should assess the extent to which it supports the development of adequate local skills; promotes competition and the emergence of an efficient domestic economy; and fosters technology and spillover effects. In the European Union, Directive 2014/24/EU, 2014/25EU (Utilities Directive) and 2014/23/EC (Concession Directive) foresee that national companies cannot be favoured within the EU. However, exploration and production of gas can be exempted from the rules of public procurement (Article 7, paragraph 2, Annex III of the Concession Directive, also Recital 25 of the Utilities Directive). In some oil-rich Gulf states with small populations (such as Qatar), national-content policies have proved an issue as the limited labour force restricts supply and makes the cost of using local labourers extremely high. In Mexico, with its large labour force and relatively low wages, this does not seem to be an issue.

Recommendation. Clarify the methodology for companies to easily calculate and measure the national content they must use. The OECD makes no other recommendation concerning national content and the minimum percentage of national content companies must use, since helping national industry is a legitimate objective. The Mexican government should be aware, however, that requiring companies to use national content will make natural-gas exploration and production more expensive and that the obligation to use national-content clauses should be accompanied by knowledge transfer, so that local companies become more competitive both in the Mexican and the international markets.

2.3.2.2. Requirement for SENER, CNH and CRE to prefer a Mexican offer under "equivalent conditions"

Description of obstacle. According to the Hydrocarbons Law, when issuing permits and granting assignments and contracts for the exploration and extraction of gas, SENER, CNH and CRE, taking account of the opinion of SE, must include in the terms and conditions a clause stating that under equivalent conditions of price, quality and timely delivery, assignees, contractors and permit holders must contract Mexican goods and services. The Hydrocarbons Law does not define what "equivalent conditions" means exactly.

Harm to competition. Foreign or Mexican suppliers selling foreign goods and services might suffer discrimination as they will have to offer better conditions than their Mexican

counterparts in order to be contracted. Furthermore, it is unclear how it is determined what "equivalent conditions" means as two offers can never be identical**.**

Policymakers' objective. The objective of the provision is to promote and support the development of the Mexican hydrocarbons industry by supporting Mexican providers serving holders of permits for activities regulated by the Hydrocarbons Law or assignees and contractors for the exploration and extraction of hydrocarbons.

Recommendation. The OECD recommends that the Mexican government abolishes the part of the provision related to the preference for national staff or nationally produced goods under equal circumstances. A transition period could be foreseen to grant Mexican companies time to adapt to new market conditions. Alternatively, the Mexican Government should consider issuing guidelines in order to clarify how to determine when circumstances are equal in which case the preference for national products and labour should apply.

2.3.2.3. Requirement for assignees and contractors to prefer Mexican offer under "equivalent conditions"

Description of the obstacle. For exploration and extraction of hydrocarbons carried out in Mexican territory, the Mexican government can either grant assignments to SPEs or contracts to private companies or SPEs. Subcontracting (i.e. acquisitions and contracts) undertaken by assignees and contractors is regulated in terms of national origin of subcontracted goods and services. In particular, 1) contractors or assignees must hire local companies if they offer "equivalent conditions to the existing ones in the international market, including quality, availability and price"; 2) contractors or assignees must preferably buy "nationally produced materials, equipment and other goods, if they are offered under 'equivalent conditions' to those available in the international market, including in terms of quantity, quality, delivery dates and price". In both cases, the best offer should be determined according to "market rules", which are defined as a "competition principle under which the parties involved in a transaction are independent and participate under equality of conditions and out of self-interest". The guidelines do not contain a definition of "equivalent conditions" so it remains unclear how they are determined, since two offers are never identical in terms of quantity, quality, delivery dates and prices.

Harm to competition. As there is no clear definition of what constitutes equivalent conditions in an offer or "market rules" to identify the best offer, there is a risk of discretionary behaviour that may lead to favour a company over another. Also, foreign or Mexican suppliers participating with foreign products or services might be discriminated against.

Policymakers' objective. To promote and aid the development of the national industry.

Recommendation. The OECD recommends that the Mexican government abolishes the part of the provision related to the preference for national staff or nationally produced goods under equal circumstances. A transition period could be foreseen to grant Mexican companies time to adapt to new market conditions. Alternatively, the Mexican Government should consider issuing guidelines in order to clarify how to determine when circumstances are equal in which case the preference for national products and labour should apply.

2.3.3. Permits and authorisations

2.3.3.1. Social-impact study

Description of obstacle. SENER, with the collaboration of the Ministry of Interior (*Secretaría de Gobernación, SEGOB*) and other relevant authorities, will undertake a social-impact study (*estudio de impacto social*) before running tenders for contracts for the exploration and extraction of hydrocarbons or before assigning an area to an SPE. The study is shared with potential contractors in the call for tender.

After a tender award, winning assignees or contractors have to submit a social-impact assessment (*evaluación de impacto social*) to SENER's General Directorate of Social Impact and Surface Occupation (Dirección General de Impacto Social y Ocupación Superficial). This assessment contains the identification, description, forecast and financial consequences of the social impacts that exploration or extraction activities could create, as well as any possible mitigation measures. The directorate has 90 working days to issue a resolution containing any recommendations for the implementation of the social-impact assessment. According to market participants, the General Directorate of Social Impact and Surface Occupation has limited staff and, as a consequence, the analysis of social-impact assessment submissions can take a considerable amount of time. On 1 June 2018, SENER issued in the DOF the Agreement for the Issue of the General Administrative Provisions on the Social-Impact Assessment in the Energy Sector (Acuerdo por el que se emiten las Disposiciones Administrativas de Carácter General sobre la Evaluación de Impacto Social en el Sector Energético), which sets a methodology for the elaboration and submission of social-impact assessments by contractors or assignees, as well as for the issuance of SENER resolutions and recommendations. This new regulation could potentially simplify the analysis of social-impact assessment submissions and reduce resolution times.

Harm to competition. Due to limited human resources, it can take SENER's General Directorate of Social Impact and Surface Occupation a significant amount of time to analyse social-impact assessments and to issue resolutions with follow-up recommendations. As a consequence, additional suppliers might be delayed in entering the market. Before publishing the methodology for the elaboration and submission of social-impact assessments in June 2018, there was also confusion among contractors and assignees about how to elaborate and include the assessment. This problem has been resolved with the new legislation.

Policymakers' objective. Social-impact studies elaborated by SENER and social-impact assessments submitted by contractors or assignees, aim to ensure that hydrocarbons projects have a positive impact on local communities, local land use and the rights of vulnerable social groups

Recommendation. Grant sufficient resources to SENER's General Directorate of Social Impact and Surface Occupation so it can issue resolutions within shorter time frames. Costs may be passed onto assignees or contractors as a fee for the analysis of social-impact assessment submissions.

2.3.3.2. Registry of Importers

Description of obstacle. Importers of hydrocarbons must be included in the Registry of Importers (Padrón de Importadores), as well as the Registry of Importers of the Hydrocarbons Sector (Padrón de Importadores Sectorial de Hidrocarburos). Both registries are held by the Tax Administration Service (Servicio de Administración Tributaria, SAT).

For each transaction, importing companies must provide the Registry of Importers of the Hydrocarbons Sector with information including from whom they will buy the gas or natural gas and to whom they will sell it, as well as proof that their clients have CRE permits for storage or distribution.

Harm to competition. The requirement for importers to name their buyers in advance might inhibit imports of LPG and natural gas. Some market participants have described these entry conditions as excessive. Also, requiring applicants to provide a list of customers to whom they will sell imported products might delay imports, as importers may not yet know potential clients.

Policymakers' objective. The objective of both registries is to control the flow of imports, and to prevent any fraudulent customs activity.

Recommendation. The OECD recommends eliminating the requirement that importers must indicate in advance to whom they will sell imported LPG or natural gas products.

2.3.3.3. Registration of third parties with CNH

Description of obstacle. For exploration and extraction of hydrocarbons carried out on Mexican territory, assignees as well as contractors have to submit annual reports to CNH detailing the quantity of reserves (i.e. 1P, 2P, 3P). These must be certified by independent third parties (*terceros independientes*), experts on the classification, analysis, estimation, assessment and certification of reserves. The assignee or contractor and independent third party have to submit their respective estimates of reserves to CNH, which then checks if both estimates are consistent. One requirement to be an independent third party is having at least ten years' experience in the oil and gas industry in areas such as exploration, geology, geophysics, reservoir engineering, production or economic assessment. Third parties can also hire specialists with the relevant experience. The law is not clear about whether international experience is regarded as equivalent to experience in Mexico. A prospective independent third party can apply to be registered with CNH at any time and, if accepted, will be registered for three years. As of September 2018, there were 15 registered independent third parties.

Harm to competition. Foreign experts might be prevented from applying as it is unclear whether experience from abroad is regarded as equivalent to national experience. Market participants, however, have not complained about the low number of independent third parties or the high charges for their services.

Policymakers' objective. To ensure that reliable professionals carry out the estimation of existing reserves of hydrocarbons in Mexican territory.

Recommendation. Clarify in the legislation that international experience is regarded as equivalent to experience in Mexico.

2.3.4. PEMEX

2.3.4.1. Possible conflict of interest within the Mexican Institute of Petroleum (Instituto Mexicano del Petróleo, IMP)

Description of the obstacle. The Mexican Institute of Petroleum (Instituto Mexicano del Petróleo, IMP) is a public research institution for the oil industry that provides technical goods, such as patented technologies, and services for research and training to develop and educate highly specialised Mexican technicians. It was created in 1965 to support PEMEX

and now provides technical assistance to the whole industry. The IMP has a board of directors consisting of the Minister of Energy, two independent experts and representatives of three universities, as well as the ministers or general directors of SHCP, SEMARNAT and PEMEX.

Harm to competition. PEMEX participation on the board of directors of a research institution providing technical support to the whole oil industry may influence the institution's decision-making process in PEMEX's favour. For instance, IMP may conduct specific research projects to favour PEMEX or PEMEX may have access to sensitive industry data, as well as knowledge of new patented IMP technologies.

Policymakers' objective. PEMEX has a seat on IMP's board of directors so that IMP benefits from the company's large industrial experience and knowledge. Industry participants have not voiced any concerns with regard to PEMEX's participation.

Recommendation. The OECD recommends amending the legislation mentioning rules on independence as to avoid any possible conflict of interest. This should include a provision that allows board members to recuse themselves when voting on any matters that could create a possible conflict of interest.

2.3.4.2. Compensation payments to PEMEX

Description of the obstacle. SENER selects areas (*áreas*) to be tendered for the exploration and extraction of hydrocarbons. After the selection of areas, CNH becomes responsible for granting exploration and production contracts through tender processes. According to the 2013 Energy Reform Decree, if PEMEX invests in the development of a project (for example, PEMEX has financed the seismic study, exploration or even drilling) that is then awarded to a different company, SENER determines the level of compensation that PEMEX will receive from the production company after estimating the "fair economic value" of the investment cost. According to the Ministry of Interior (*Secretaría de Gobernación, SEGOB*), general guidelines that describe the methodology for calculating "fair economic value" do exist, but remain unpublished. Furthermore, in the few cases that have so far been determined (all in midstream cases), PEMEX claims that its compensation was undervalued.

Harm to competition. The lack of specific guidelines to determine "fair economic value" could affect both PEMEX and its competitors if a payment was over- or underestimated. It cannot be determined whether PEMEX is at a competitive disadvantage, as the specific guidelines to determine fair economic value have never been published. Furthermore, the lack of specific guidelines may generate juridical uncertainty for both PEMEX and its competitors.

Policymakers' objective. To compensate PEMEX for its investments in areas that are later awarded to other companies and so result in lost profits.

Recommendation. Publish the methodological guidelines used to determine the compensation to PEMEX, and the level of compensation for investments in areas that are later granted to other companies.

2.3.4.3. Farmouts

Description of the obstacle. Farmout agreements – also known in Mexico as strategic agreements (*asociaciones estratégicas*) – are agreements between an SPE that has been granted an assignment (e.g. the mineral rights of an area) and a private company that is

interested in providing services to the SPE for the project in exchange for a percentage of the profits. The SPE is known as the "farmor", while the private company is known as the "farmee". In Mexico, the usual arrangement of a farmout involves PEMEX being granted an assignment by CNH and then asking CNH for a partner. Mexican legislation allows for two types of farmout agreements: 1) if an SPE had a standing agreement with a private company prior to the 2013 energy reform and both parties decide that the new legal arrangements are better for both than those allowed before the reform, then the SPE can ask CNH to transfer the agreement into a financed public work (*obra pública financiada*), an integral contract (*contrato integral*) or a farmout; 2) CNH begins a new tendering process to choose a new partner for the SPE. Currently, an SPE is consulted during the pre-qualification stage, but its opinion is not binding. For example, if PEMEX has been assigned an area in which it wants to explore and produce hydrocarbons, but does not want to make all the financial investment itself, it might seek a partner. Yet, to do so it needs to ask CNH to hold a farmout-agreement procedure. According to PEMEX, this procedure can be lengthy and dissuade potential partners. Until now, according to industry participants, only farmout agreements falling under the first scenario have taken place.

Harm to competition. PEMEX is only asked for its non-binding opinion after CNH has decided to run a tender process for choosing a farmout partner (farmee). An SPE is therefore in a position where it can object to partners, but cannot start a process or freely choose its own partner. This decision-making process could delay new farmout agreements.

Policymakers' objective. SPEs are most likely barred from freely choosing their farmout partners to prevent them partnering with companies that lack the necessary technical expertise or financial capabilities. According to CNH, SPEs can request that a farmout procedure be initiated. They can also object to a suggested partner. CNH must guarantee a fair and transparent process. As of September 2018, CNH had approved three farmout procedures, which took, on average, seven months from publication of call of tenders until the final decision.

International comparison. The international standard appears to be that most state-owned companies operating in the oil and gas exploration and extraction sector have the freedom to choose their own partners in the context of a farmout agreement. For instance, in Norway, state-owned company Equinor (formerly Statoil) runs its own tender procedures for farmout contracts.

Recommendation. Allow SPEs to decide when to start a tender procedure, run the process and choose their own farmout partners. The process should be supervised, rather than managed, by CNH to guarantee a fair and transparent process.

2.3.4.4. Processing of gas through PEMEX

Description of the obstacle. Currently, PEMEX owns the only nine natural-gas processing plants (*complejos procesadores de gas*) in Mexico. Processing gas is not subject to economic regulation, such as tariffs or open-access obligations.

Harm to competition. Companies wanting to process natural gas in Mexico have to use facilities that belong to PEMEX; this might lead to PEMEX using its market power when negotiating prices and conditions for access.

Policymakers' objective. Mexico has no regulation foreseeing open access to PEMEX's processing facilities, most likely because the facilities are not regarded as a natural monopoly. Currently, market participants do not seem to regard lack of access to processing as a problem. This might change, however, once private companies start producing gas. PEMEX

itself stated that it is open to offering processing facilities to third parties. According to PEMEX, its gas-processing facilities currently run at 50% capacity or less.

International comparison. To the best of the OECD's understanding, most countries have no rules about access and tariffs to processing facilities. In 2009, New Zealand introduced Gas Processing Facilities Information Disclosure Rules, which required that all information regarding the capability and capacity of gas-processing facilities, as well as requests by third parties for accessing these processing facilities be published. This regulation and its effects were then examined by the New Zealand Ministry of Energy and Resources. However, the regulation was not renewed after its expiration on 27 June 2014, as the Ministry of Energy and Resources found that no related competition issues had emerged from access to processing facilities and as such no long-term regulations were needed.

Recommendation. The OECD recommends undertaking a study on the possibility of regulating access to PEMEX's natural-gas processing facilities for a limited time period. The right to access could be limited, for instance, to a five-year period and be granted on a non-discriminatory basis. The study might also find strong arguments against a regulation of processing, especially as processing natural gas is generally not regarded as a natural monopoly: interested parties could choose to either negotiate with PEMEX or, if not satisfied with the conditions, build their own processing facilities or use processing facilities abroad.

2.3.4.5. Wet natural gas prices and conditions

As part of the asymmetrical regulation, prices at which PEMEX sells wet gas (i.e. natural gas containing other compounds than methane, such as butane, propane and ethane) are regulated by CRE. Asymmetrical regulation at upstream and midstream level is dealt with at 2.4.4.

2.3.5. Non-harmonised standards

Description of the obstacle. NOMs are issued by the federal government and compliance with them is mandatory. In the OECD's review of the upstream gas sector, the OECD found eight NOMs that are currently not in line with international norms. These are:

- NOM-EM-005-ASEA-2017, setting the criteria for classifying special-use residuals in the hydrocarbons sector.
- NOM-001-SEMARNAT-1996, setting the maximum legal limits for the discharge of pollutants in residual waters and national property.
- NOM-003-CNA-1996, setting the minimum requirements to construct water wells in order to prevent pollution of aquifers.
- NOM-004-CNA-1996, setting the requirements to protect water-quality standards in aquifers during the maintenance, rehabilitation or closure of wells.
- NOM-011-CONAGUA-2015, setting the methodology to determine the annual average of national surface and underground water.
- NOM-115-SEMARNAT-2003, setting the standards and preventive measures for the drilling or maintaining of oil wells in areas of agriculture, livestock farming or wasteland, and accompanying environmental protections.

- NOM-143-SEMARNAT-2003, setting standards for the handling and injection of connate water (water trapped within sedimentary rocks) in receptacle rock formations.
- NOM-138-SEMARNAT/SSA1-2012, setting the standards for maximum permissible levels of hydrocarbon solids and liquids in different types of soil and specifications for their remediation.

Harm to competition. Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.

Policymakers' objective. In Mexico, non-harmonisation of NOMs must be disclosed according to letter VI, Article 41 of the Federal Law on Metrology and Standardisation, which states that NOMs must contain a degree of concordance with international norms and criteria.

Recommendation. The OECD recommends updating all NOMs so that they are in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if international standards or best practices already exist. The National Standardization Programme for 2018 mentions that four of these NOMs (NOM-001-SEMARNAT-1996, NOM-115-SEMARNAT-2003, NOM-143-SEMARNAT-2003 and NOM-138-SEMARNAT/SSA1-2012) are in the process of being modified.

2.4. Midstream

The midstream sector comprises the transportation, mainly by pipeline, and storage of gas. The OECD makes 17 recommendations at the midstream level about subjects including the construction of new infrastructure for natural-gas pipelines, reporting obligations with authorities, asymmetrical regulation of PEMEX, and other restrictions and standards.

- Construction of new infrastructure for natural gas
    - Municipal construction permits for building new gas pipelines.
    - Misalignment of interests between municipal authorities and companies.
    - Change of land use.
    - Compensation of land owners.
    - Validation of contracts by a local judge.
- Obligations to report to authorities
    - Double-notification of SENER and SEDATU concerning negotiations with owners.
    - Planning report.
    - Report of accidents.

- Asymmetrical regulation of PEMEX
  - Publication of "information system" of VPM natural-gas prices.
  - Maximum VPM prices for PEMEX.
  - CRE approval for commercialisation contracts for LPG and natural gas and the right to early termination.
- General
  - Requirement for natural-gas processing permit holders to buy national goods and services.
  - Lack of regulation for setting tariffs.
- Non-harmonised standards

2.4.1. Construction of new infrastructure for natural gas

Currently, only 8% of Mexican households use natural gas as their main fuel source as most Mexican households, as well as the communities they live in, are not connected to natural-gas pipelines and have to rely on LPG. The OECD recommends a number of measures to make building natural-gas pipelines easier, which, if implemented, would lead to more consumers having a choice between LPG and natural gas. The OECD estimates that the benefit to consumers would range between MXN 1 395.7 million and MXN 2 670 million. The calculation is explained in detail in Annex 2.A.

2.4.1.1. Municipal permits for building new gas pipelines

Description of the obstacle. Market participants have frequently described municipal construction permits as the biggest obstacle to building new gas pipelines. When building natural-gas pipelines, companies need to obtain a permit from CRE (which grants permits for the transport, storage and distribution of natural gas through pipelines) and a construction permit from the relevant municipal authority. According to point f, letter V of Article 115, of the Mexican Constitution, municipal governments have the power to issue construction permits and licences. According to Article 96 of the Hydrocarbons Law, the federal government, state governments and municipalities (*municipios*) must co-operate to promote procedures that grant permits and authorisations in matters of transport, storage and distribution of hydrocarbons through pipelines. According to market participants, municipal governments frequently deny or significantly delay construction permits to companies that already possess a federal CRE permit to transport natural gas through pipelines.

Harm to competition. Difficulties in obtaining municipal permits for infrastructure construction delays, or in some cases even prevents, the development of natural-gas pipeline projects. Natural-gas companies cannot easily enter regional markets and compete with local LPG distributors.

Policymakers' objective. The right of municipalities to grant construction permits is guaranteed in the Mexican Constitution.

Recommendation. The OECD recommends establishing a department within a federal agency to facilitate business for natural-gas companies at a municipal level (and give it sufficient financial and human resources). This department would work within the limits

of Article 115 of the Mexican Constitution and respect municipal autonomy in the authorisation of land use and issuance of construction licences. Its tasks might include:

- Offering models of permit applications (*modelos de solicitudes de permiso*) to municipal authorities.
- Signing collaboration agreements (*convenios de colaboración*) with municipal authorities or states.
- Advising applicants on how to best deal with municipal authorities.
- Publishing an annual report describing the situation for natural-gas companies at the local level.
- Organising capacity-building workshops with municipal officials.
- Acting as amicus curiae in court in cases where municipal permits are unduly denied.

2.4.1.2. Misalignment of interests between municipal authorities and companies

Description of the obstacle. The problem described above under 2.4.1.1. is part of a wider problem, often described as a misalignment of interests between municipal authorities and companies interested in developing natural-gas transport and distribution projects in municipalities. Municipal authorities frequently do not support (and even hinder) new projects for the construction of natural-gas pipelines. This can lead to construction delays, and sometimes even to pipelines remaining unbuilt.

Harm to competition. Many natural-gas projects are delayed or even prevented at a municipal level. As a consequence, natural-gas distributors are often not able to compete with LPG distributors.

Policymakers' objective. While Mexican legislation does not deal with this misalignment of interests, internationally, a number of jurisdictions do foresee some form of compensation to municipalities. For example, in Spain, municipal regulations often compel gas companies to compensate municipalities with, for example, 1.5% of natural gas gross sales.

Recommendation. The OECD recommends studying the possibility of granting incentives to municipalities (such as regular compensatory payments for community ground on which natural gas is sold or transported across or contributions to infrastructure payments). However, care should be taken that payments do not lead to discrimination between natural-gas and LPG suppliers.

2.4.1.3. Change of land use

Description of the obstacle. Natural-gas companies intending to build a pipeline have to change the land-use registration of the land on which the planned pipeline is to be built. Much of the land in question is currently registered as forestry at the Ministry of Environment and Natural Resources *(Secretaría de Medio Ambiente y Recursos Naturales, SEMARNAT*). Companies interested in changing the land use of forests (*cambio de uso de suelo en terrenos forestales*) for their projects have to apply using a form issued by SEMARNAT and submitted to ASEA. SEMARNAT has the power to issue authorisations to change the land-use registration of forestry lands and has 60-75 work days to issue any resolution. If SEMARNAT does not issue a resolution within this timeframe, the application is automatically rejected (*negativa ficta*).

Harm to competition. Construction of new natural-gas transport and distribution infrastructure is delayed whenever SEMARNAT does not issue a resolution within the agreed time frame, as applications are by default rejected (*negativa ficta*). According to industry participants, this happens frequently.

Policymakers' objective. The objective of this restriction is to grant SEMARNAT control of how land in forestry zones is used.

Recommendation. The OECD recommends changing the legislation so that if SEMARNAT, through ASEA, does not answer a request within the established time frame and does not have a reason to "stop the clock" (such as an application being incomplete), an *authorisation* (instead of a rejection) will be granted by default (*afirmativa ficta*). This change would avoid project delays for new gas-pipeline projects. In cases where an authorisation granted by default leads to unforeseen negative consequences, SEMARNAT should be able to challenge or withdraw the authorisation.

2.4.1.4. Compensation of land owners

Description of obstacle. Natural-gas companies intending to build a new pipeline have to agree a compensation payment with owners or holders of land (*titular o propietario de la tierra*) for the use of their property. On 2 June 2016, SENER issued an agreement that contains general conditions and determines a minimum amount to be paid to the owner or holder for the use of the property. This new agreement does not, however, foresee a maximum payment amount. Current compensation payments are calculated according to a table published by the Institute of National Asset Management and Appraisal (Instituto de Administración y Avalúos de Bienes Nacionales, INDAABIN), a decentralised public agency of the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público, SHCP*); its purpose is to administer and value federal and parastatal real-estate assets.

Harm to competition. Current Mexican legislation does not contain a maximum amount that gas companies have to pay to land owners to use their property, as INDAABIN's valuation only serves as a reference. This lack of a maximum gives the landowner or holder strong bargaining power and the possibility of setting high prices and raising the cost of building natural-gas pipelines. Also, negotiations with landowners or holders may lead to delays in building the pipelines and restrict natural-gas companies wishing to enter regional markets and compete with local LPG distributors.

Policymakers' objective. The objective of the provision is to ensure fair compensation for landowners or holders, while allowing gas companies to build pipelines without unnecessary delays.

Recommendation. Compensation should be set by a federal authority and not be determined in bilateral negotiations between a gas company and a landowner or holder. When setting the amounts to be paid, the agency should take into account relevant factors such as average land prices in this area, as well as INDAABIN's valuations.

2.4.1.5. Validation of contracts by a local judge

Description of obstacle. Assignees or contractors (in this case, gas companies) negotiate agreements with landowners or holders (*propietarios o titulares de la tierra*), including community-owned land or *ejidos*, to establish compensation payments and conditions for the use of land through which gas pipelines pass. Once negotiations have ended, a local judge (*juez de distrito en materia civil o tribunal unitario agrario*) must validate each contract before it enters into force.

Harm to competition. Different local judges have to validate numerous agreements as a prerequisite of new natural-gas pipelines being built. This might delay the construction of natural-gas pipelines and restrict the ability of natural-gas distributors to compete with LPG distributors.

Policymakers' objective. Guarantee that the rights of owners or holders of lands, goods or rights affected by the transport activities through pipelines are respected.

Recommendation. The OECD recommends that in addition to local judges, notaries should also be able to validate contracts between the owners or holders of land (including *ejidos*), goods or rights and the assignees or contractors (in this case, gas companies).

2.4.2. Obligations to report to authorities

2.4.2.1. Double-notification of SENER and SEDATU concerning negotiations with owners.

Description of obstacle. When a gas company interested in building new pipelines begins negotiations with the owners or holders of land (*titular de la tierra*) about compensation, it must notify SENER and SEDATU separately of each negotiation. Notifications are on a property-by-property (*predio por predio*) basis. Both SENER and SEDATU use their own notification forms, even though both demand similar data.

Harm to competition. The need to notify two authorities on a property-by-property basis and provide similar data twice generates unnecessary administrative burdens for companies and might unnecessarily delay projects.

Policymakers' objective. The obligation to inform the authorities aims to guarantee individualised follow-up of all negotiations between companies and owners or holders of land, goods or rights necessary to the transport by pipelines of hydrocarbons (including natural gas).

Recommendation. OECD recommends combining both notification templates, so that only one notification has to be submitted to either SENER or SEDATU.

2.4.2.2. Need to obtain planning report

Description of obstacle. NOM-003-ASEA-2016 establishes that each time permit holders for distribution of natural gas or LPG build new infrastructure, extend or modify their facilities, they must obtain a planning report (*dictamen de diseño*) from a verification unit (an accredited third party that performs conformity evaluation activities) to check that the new or extended facilities or modifications were constructed according to the relevant NOMs.

Harm to competition. The wording of this NOM implies that permit holders must obtain a new planning report for every modification to their facilities, no matter how minor. According to industry participants, however, in practice, the norm is applicable only for new pipelines. The text of the NOM might lead to uncertainty for industry participants as companies.

Policymakers' objective. Most likely, the objective of this restriction is to ensure quality standards for the expansion and modification of facilities for the distribution of natural gas.

Recommendation. OECD recommends clarifying the legislation so that this provision is only applicable when building new pipelines.

2.5.2.3. Double reporting of accidents to CRE and ASEA

Description of the obstacle. Importers and exporters of natural gas, as well as permit holders for the transport, storage and distribution of natural gas must notify CRE about any loss (*siniestro*) or incident that takes place. Companies must elaborate a detailed report on those incidents, as well as on the measures that were taken to control them. This report must be presented to CRE within ten working days following the incident or loss. Companies also have to provide a similar report to ASEA. Incidents and accidents are classified as follows: 1) A Type 3 event is the most severe and can consist of, for example, two or more deaths on or off the premises, harm to premises, and operational disruption. 2) A Type 2 event might consist of one or more deaths on the premises. 3) A Type 1 event might consist of injuries that cause medical leave for staff and which occurred in the exercise or as a result of work tasks.

Harm to competition. Companies have to send two similar report forms on accidents, losses (*siniestros*) and incidents to two different authorities. This creates additional costs for market participants.

Policymakers' objective. The current legal framework places ASEA as the authority in charge of overseeing the industrial and operative safety in the hydrocarbons sector, while CRE supervises compliance of permit holders with the law.

Recommendation. The OECD recommends allowing companies to provide a single report to ASEA and CRE. Ideally, this report should be uploaded to a common one-stop-shop platform (*ventanilla única*) after which the information could be accessed by both agencies. The creation of the Co-ordinated Assistance Office for the Energy Sector (Oficina de Asistencia Coordinada del Sector Energético, ODAC) is a first step in this direction.

2.4.3. Asymmetrical regulation of PEMEX

The 2013 energy reform changed the legal status of PEMEX and established "asymmetrical regulation", meaning that the former state monopoly is subjected to greater regulatory restraint than other participants in the gas industry for such as time as deemed necessary to rebalance PEMEX's dominant market position. The concept of asymmetrical regulation was first introduced by the UK government in the 1980s and early 1990s with the privatisation of the telecommunications and energy sectors.

Provisions restricting PEMEX in its business practices include:

- The requirement to publish its first-hand sales (*ventas de primera mano*, VPM) for natural gas on an "information system".
- VPM prices for LPG must be approved by CRE.
- Commercialisation contracts for LPG and natural gas must be approved by CRE and include the right to an early termination.
- Regulation of prices for wet gas (upstream)

2.4.3.1. Publication of "information system" of VPM natural-gas prices

Description of obstacle. VPM sales are defined as the first transfer on Mexican soil of a hydrocarbon to third parties by a Mexican state productive enterprise (*empresa productiva del estado*, SPE) or a private company on behalf or at the behest of the state. All contracts and transactions that PEMEX's subsidiaries have concluded between themselves for natural gas VPM must be published by PEMEX on its "information system"; it must

include information of the purchase-sale terms, prices and quantities of these contracts and transactions. All this information must be made available by PEMEX to potential buyers of VPM natural gas. According to PEMEX Industrial Transformation (PEMEX Transformación Industrial, PEMEX TRI), there is not yet a centralised electronic platform for publishing this information, even if the information is available at different locations on the PEMEX website.

Harm to competition. PEMEX's incentives to offer discounts to targeted customers may be reduced, as its competitors might be able to observe such discounts in the information system and react to them within short time periods.

Policymakers' objective. The "information system" seeks to prevent discriminatory offers between PEMEX subsidiaries and third-party buyers.

2.4.3.2. Maximum VPM prices for PEMEX

Description of obstacle. As part of the asymmetrical regulations, CRE introduced a methodology that allowed PEMEX to compute maximum prices for LPG VPM. The formula used by PEMEX (and monitored by CRE) takes into account several factors, including the value of LPG at the relevant reference point (borders or ports where LPG can be imported or exported) in order to determine the price at each of PEMEX's processing facilities; the minimum transport cost to deliver LPG to each selling point; and infrastructure costs. Since 1 March 2017, LPG VPM prices have been calculated weekly.

Harm to competition. PEMEX claims that maximum-price regulation makes it slow to adapt to new market situations as it requires CRE approval for every new LPG VPM selling point before being able to apply it. PEMEX claims this can take CRE several months and so it is hindered from making timely and competitive offers.

Policymakers' objective. The objective of the provision is to create market conditions (in particular, prices) similar to those that would be exist in a truly competitive market. With regulated LPG VPM prices, CRE seeks to ensure efficient delivery of LPG to prevent undue price discrimination, as well as cross-subsidies. According to CRE, PEMEX still holds 50-70% of the LPG wholesale market and other importers use much of their imported product themselves.

2.4.3.3. CRE approval for commercialisation contracts for LPG and natural gas and the right to early termination

Description of obstacle. The commercialisation of both LPG or natural gas by any PEMEX subsidiary and trading, management, storage and distribution service are subject to asymmetrical regulation. In particular, CRE must approve commercialisation contracts that PEMEX subsidiaries sign with buyers. CRE resolution RES/1520/2017 provides a template contract that PEMEX TRI can sign with buyers for the commercialisation of LPG. The 13th clause of this template – which PEMEX claims it is required to include by CRE – establishes that the contract can be terminated before the official end date by either party with at least 30 working days' notice.

Harm to competition. The mandatory clause diminishes PEMEX's ability to plan long-term as customers are able to leave at short notice. The clause puts PEMEX TRI at a competitive disadvantage since its competitors holding comparable CRE permits to commercialise LPG can sign contracts with buyers without a similar termination clause.

Policymakers' objective. The objective of the provision is to help PEMEX customers switch to other suppliers if they find a better offer.

2.4.3.5. Regulation of prices for wet gas (upstream)

Description of obstacle. Prices at which PEMEX sells wet gas (i.e. natural gas containing other compounds than methane, such as butane, propane and ethane) are regulated by CRE. Before the 2013 Energy Reform, PEMEX subsidiary PEMEX Exploration and Production (PEMEX Exploración y Producción, PEP), together with the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público, SHCP*) calculated the internal price that PEP could charge to PEMEX subsidiaries for wet gas, among other hydrocarbons. Article 82 of the Hydrocarbons Law establishes that CRE can issue regulations on the terms and conditions, as well as prices for hydrocarbons activities subject to CRE regulation. Therefore, the prices and terms and conditions at which PEP sells wet gas (among other products) to PEMEX TRI, another PEMEX subsidiary, can be determined by CRE. According to the 12th recital of resolution RES/389/2014, as long as CRE itself deems its material and human resources insufficient to calculate prices and publish terms and conditions, the 2014 prices and terms and conditions for selling all hydrocarbons, which include wet natural gas, will continue to be applied. The resolution is not clear, however, about the price level of wet gas sold by PEP to private companies. According to PEP, CRE is planning to issue a price methodology in the near future, though it will not include sales terms and conditions.

Harm to competition. This restriction limits PEP's ability to sell wet gas to other PEMEX subsidiaries as PEP cannot charge the sale price it chooses. PEMEX claims that the regulated price is not a competitive price based on current market conditions. Also, it seems that there is no mechanism for PEMEX to sell to third parties; PEMEX does not publish a price for third parties.

Policymakers' objective. To ensure that PEMEX TRI has a steady supply of wet gas in order to produce dry gas and LPG, among other hydrocarbons**.**

2.4.3.5 Recommendation concerning asymmetrical regulation

The OECD recommends that CRE publish regular (for example, annual) reports about the status of markets in which PEMEX is subject to asymmetrical regulation. In these reports, CRE should explain the criteria on which its evaluation is based for each market and the changes still needed for asymmetrical regulation to be lifted.

The OECD team has found it difficult to gather information about the current status of asymmetrical regulation and when it will be lifted. CRE's claim that a lack of resources is preventing it from issuing a price methodology and constantly updating it prices could not be verified. To the best of the OECD's knowledge, CRE does not regularly publish reports about the status of markets in which PEMEX is subject to asymmetrical regulation. CRE claims that it is impossible to issue any fixed criteria (e.g. a market threshold under which PEMEX's market share must fall) that, if fulfilled, would lead to the asymmetrical regulation being lifted. Instead, CRE claims that it will be necessary to evaluate the situation on a case-by-case basis.

2.4.4. General

2.4.4.1. Requirement for natural-gas processing permit holders to buy national goods and services

Description of the obstacle. SENER permits for natural-gas processing have terms and conditions that stipulate permit holders must choose Mexican goods or services if Mexican

and foreign providers offer "equivalent conditions", which may include similar prices, quality and delivery times. This regulation contains neither a full definition of "equivalent conditions" nor further explanations about equality of prices, quality and timely delivery. It is therefore not clear how "equivalent conditions" are determined, since two offers will almost never be identical in terms of prices, quality and delivery.

Harm to competition. The provision discriminates against foreign providers of goods and services serving natural-gas processing permit holders. Foreign providers must offer better conditions than their Mexican counterparts in order to be chosen by permit holders. This can also prevent private companies from contracting their preferred supplier. As it is unclear what the term "equivalent conditions" means, there is ambiguity about when permit holders should contract a Mexican provider instead of a foreign provider.

Policymakers' objective. The most likely objective is to support Mexican providers serving permit holders. Several other jurisdictions have this type of provision to help the national economy.

Recommendation. The OECD recommends three options for the Mexican government to choose: abolish the "equivalent conditions" provision; issue guidelines to clarify how and when the "equivalent conditions" provision is applied; or no recommendation as the practical effect of the provision is limited and two offers under identical conditions would be extremely rare.

2.4.4.2. Lack of regulation for setting tariffs

Description of the obstacle. According to Articles 81 and 82 of the Hydrocarbons Law, CRE, after co-ordinating with SENER, should issue a methodology for setting tariffs for the Mexican integrated hydrocarbons pipeline systems. (Letter XXXVI of Article 4 of the Hydrocarbons Law defines integrated systems as systems for the transport of gas through pipelines and its storage grouped together for tariff purposes and with general conditions for the provision of services, allowing for the operational co-ordination between different infrastructures.) According to industry participants, there is no detailed regulation for the tariffs applied to integrated systems. Companies that transport natural gas require a CRE permit, which has an annex called Terms and Conditions for the Provision of Services (Términos y Condiciones para la Prestación de los Servicios, TCPS); this establishes general tariffs, rights and obligations that permit holders must apply to their users. CRE approves the maximum tariffs that transporters can charge depending on the modalities of the services (for example, constant service, interruptible service).

Harm to competition. The lack of a detailed methodology regulating the setting of targeted tariffs within integrated systems creates legal uncertainty for users of natural-gas transport capacity, as holders of permits to transport natural gas could theoretically set tariffs at their discretion provided they were below maximum tariffs.

Policymakers' objective. CRE is already working on establishing a methodology for setting more targeted tariffs for integrated systems. While it was foreseen that specific methodologies for all activities would be issued in 2018, it appears that only the distribution methodology will be published; the remaining tariffs have been announced for either 2019 or 2020. This methodology will be established through General Administrative Provisions (Disposiciones Administrativas de Carácter General, DACG).

Recommendation. The OECD recommends establishing specific regulations that provide users of natural-gas transport capacity with certainty about levels of transport tariffs. The tariffs, as well as their methodology, should be published and easily accessible.

2.4.5. Non-harmonised standards

Description of the obstacle. In the review of the midstream gas sector, OECD found five NOMs that specifically state that they are not in line with international norms. These were:

- NOM-027-SESH-2010, setting the requirements to be fulfilled for the administration of all operational pipelines used for the collection and transportation of hydrocarbons.
- NOM-117-SEMARNAT-2006, setting the environmental-protection specifications for carrying hydrocarbons and petrochemicals in a liquid and gaseous state.
- NOM-007-ASEA-2016 setting the minimum requirements and technical specifications of industrial safety, operational safety and environmental protection, which must be met by regulated companies for natural-gas, ethane and natural coal-gas transportation through pipelines.
- NOM-010-ASEA-2016 setting the requirements and specifications to be met in loading and discharging terminals of compressed natural gas in transportable storage systems, as well as compressed natural-gas-vehicle fuelling stations.
- NOM-015-SECRE-2013 setting the minimum features, specifications, criteria and procedures to be met in the design, construction, safety, operation and maintenance of LPG storage systems.

Harm to competition. Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.

Policymakers' objective. In Mexico, non-harmonisation of NOMs must be disclosed according to letter VI, Article 41 of the Federal Law on Metrology and Standardisation, which states that NOMs must contain a degree of concordance with international norms and criteria.

Recommendation. The OECD recommends updating all NOMs so that they are in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if international standards or best practices already exist. The *National Standardisation Programme for 2018* mentions that four of these NOMs (NOM-027-SESH-2010, NOM-117-SEMARNAT-2006, NOM-007-ASEA-2016 and NOM-015-SECRE-2013) are in the process of being modified.

2.5. Downstream

The downstream sector comprises the distribution and retail of LPG and natural gas. Distributors are wholesalers that buy natural gas or LPG from PEMEX or private companies, and sell it to retailers. According to Mexican law, distribution and retail are separate activities; in practice, however, distributors often also sell directly to end-users.

The OECD makes 35 recommendations at the downstream level for the natural gas and LPG sectors separately, and general recommendations affecting both sectors. These are:

- LPG
    - Municipal permits for LPG related activities
        - Municipal permits for land use for LPG distribution
        - Municipal permits for retailers to sell LPG cylinders
    - Duration of CRE permits for LPG related activities
    - Time frame for CRE to issue LPG permits
    - CRE authorisation of new vehicles used to distribute LPG
    - Ownership regime of cylinders
    - Partial filling of LPG cylinders, known as *picteleo*
    - Inspection system for LPG cylinders
    - No PROFECO NOM to deal specifically with the verification of LPG cylinder's net content
- Natural Gas
    - Duration of CRE permits for natural-gas related activities
    - Exchange of information with PEMEX Etileno
- Regulations for both natural gas and LPG
    - Lack of one-stop shop *(ventanilla única)*
    - Co-ordinated inspections of CRE and ASEA
    - Independent third parties to assure compliance with law
    - Natural-gas and LPG price-comparison tool for residential consumers
    - Non-harmonised standards

2.5.1. Liquid petroleum gas (LPG)

2.5.1.1. Municipal permits for LPG-related activities

As described above, municipal construction permits are often seen as the biggest obstacle to building new gas pipelines. LPG distributors also face several difficulties due to the requirements to obtain municipal permits at the downstream level.

A number of LPG distributors and retailers' activities require municipal permits such as for land use for LPG distribution and for selling LPG cylinders.

2.5.1.1.1. Municipal permits for land use for LPG distribution

Description of obstacle. Distributors often face difficulties in obtaining municipal land-use permits. Companies wishing to distribute LPG through plants must apply for a permit from CRE and also obtain a land-use permit from municipal authorities. According to point d) of letter V of Article 115 of the Mexican Constitution, municipalities have the power to authorise, control and oversee the use of land within their competence. Municipal legislation on land use differs significantly between municipalities. There is no national practice for how municipalities grant land permits. While not a problem in some parts of the country, in others, LPG operators face serious difficulties in accessing land on which to build LPG-distribution plants.

Harm to competition. There is uncertainty as to whether companies with a CRE permit to distribute LPG through plants will be granted a municipal land-use permit and so be able to carry out their commercial activity.

Policymakers' objective. The probable objective is to enable municipal governments to control urban planning and elaborate municipal development plans. This right of municipalities is guaranteed by Article 115 of the Mexican Constitution.

Recommendations. The OECD recommends establishing a department within a federal agency to facilitate business for LPG companies at a municipal level and provide that department with sufficient financial and human resources. This might be the same department that also deals with municipalities' construction permits for natural-gas pipelines at midstream level. The department would work within the limits of Article 115 of the Mexican Constitution and respect municipalities' autonomy in the areas of land-use authorisation and the issuance of construction licences. Its tasks might include:

- Suggesting models of permit applications (*modelos de solicitudes de permiso*) to municipal authorities.
- Signing collaboration agreements (*convenios de colaboración*) with municipal authorities or states.
- Advising applicants on how best to deal with municipal authorities.
- Publishing an annual report about the situation of LPG companies at the local level.
- Holding capacity-building workshops with municipal officials.
- Acting as amicus curiae in legal cases about municipal permits that have been unfairly denied.

For LPG-distribution plants, this department could offer models of land-use permit applications and hold capacity-building workshops.

2.5.1.1.2 Municipal permits for retailers to sell LPG cylinders

Description of obstacle. Retailers often have difficulties selling LPG cylinders due to complications in obtaining municipal permits. Currently, LPG cylinders in Mexico are mainly sold by distributors. Very few retailers, such as supermarkets or service stations, are active in the market selling LPG cylinders to end consumers from their premises. In order to sell portable cylinders at service stations and retail stores, companies need both a federal permit from CRE and municipal permits from local authorities for the building of facilities or for the refurbishing of premises. Municipal permits, however, are often difficult to obtain as requirements can vary across municipal authorities and must be obtained on an establishment-by-establishment basis (i.e. individually for each store or service station).

Harm to competition. The lack of clear criteria for the granting of municipal permits appears to make the sale of portable cylinders at retail stores and service stations more difficult. The lack of additional suppliers, especially retail stores and gas stations, deprives consumers of greater diversity and better prices. According to COFECE's 2018 report *The Transition to Competitive Energy Markets: LPG*, the entry of an additional competitor into regional LPG markets could exert additional competitive pressure on incumbent distributors and lead to a significant price reductions: up to 6.56% for regions where only one distributor is present.[142]

Policymakers' objective. Municipal permits most likely aim to ensure the safety of retail storage facilities selling LPG cylinders. According to points d) and f) of letter V of Article 115 of the Mexican Constitution, municipalities have the power to authorise, control and oversee the use of land, within their competence, as well as to issue construction licenses.

Recommendations. The OECD recommends establishing a department within a federal agency to facilitate business for LPG companies at a municipal level, as described above. For retail storage facilities selling LPG cylinders (*bodegas de expendio*), the department could also offer model permit applications to municipalities. If the OECD recommendation to increase the number of LPG distributors is fully implemented, and more supermarkets and large fuelling stations are able to sell portable cylinders, the benefit to consumers is estimated at between MXN 787.1 million and MXN 1 338.8 million. This calculation is explained in detail in Annex 2.A.

2.5.1.2. Duration of CRE permits for LPG-related activities

Description of the obstacle. The following LPG-related activities require a permit: treatment and refining of oil; imports of LPG; and transport, storage, distribution, commercialisation and sales to the public. The requirements for these permits are established in Articles 50 and 51 of the Hydrocarbons Law. All these permits, with the exception of SENER permits to import LPG, can be granted for up to 30 years, and extended once for up to half of their original duration. In total, each CRE permit can therefore be valid for a total of up to 45 years. According to CRE, the same type of permits are granted for the same duration to all permit applicants and no discrimination takes place.

Harm to competition. The duration of the permits might pose a competition concern as, due to the lack of guidelines, CRE and SENER could theoretically discriminate between applicants in the same activity by granting permits with different durations to different applicants. A competitor who had to renew a permit with a shorter duration would have to bear additional costs in comparison to a competitor holding a permit with a longer duration. However, it seems that in practice no discrimination between competitors has taken or is taking place.

Policymakers' objective. The requirement to apply for a permit aims to ensure that permit holders fulfil all requirements necessary to carry out the activities in question correctly. The duration of each permit should depend on after what time it seems reasonable to re-evaluate if all requirements are still being fulfilled.

Recommendation. The OECD recommends that CRE should issue guidelines for determining the duration of LPG-related permits depending on the specific activity to give market participants more transparency.

2.5.1.3. Time frame for CRE to issue LPG permits

Description of obstacle. Transport, storage, distribution and retail of LPG (among other activities) require a CRE permit. Interested companies must complete an application proving that they comply with the conditions of Articles 50 and 51 of the Hydrocarbons Law. These requirements include providing proof of insurance, projects' technical specifications, and the required investment. CRE has 90 working days after receiving an application to decide whether to grant or refuse a permit. During the first 30 working days, CRE can notify the applicant about an application it considers incomplete and the applicant can correct any omission or deficiency in the information or documentation initially provided. In that case, the time limit for issuing the resolution is suspended and will only

resume the working day after the applicant has provided the missing information. CRE has reduced the time it is allowed to analyse certain LPG-related permits from 90 to 78 working days, for the following permits: i) commercialisation of LPG and propane; ii) distribution of LPG through plants; iii) LPG retail through service stations for own consumption; iv) LPG retail through retail storage facilities; v) LPG retail through specific service stations; vi) LPG transport through means other than pipelines; and vii) LPG distribution through tanker trucks.

Harm to competition. Market entry of new participants could be delayed if, as claimed by some market participants, CRE takes too long to issues permits and extends the official deadlines. Participants are kept out of the market until they obtain a permit from CRE.

Policymakers' objective. To ensure that permit applications are complete so CRE can take its decisions based on all the relevant facts. CRE has been working on reducing its time frames to analyse applications to permits in matters of natural gas and LPG.

Recommendation. The OECD recommends that CRE publish an annual report with statistics on the average time needed to issue different permits, as well as how often additional information is required. Moreover, explanations should be provided for the cases where CRE does not meet its own deadlines. The OECD encourages CRE to pursue its efforts in reducing the timeframe for issuing permits.

2.5.1.4. CRE authorisation of new vehicles used to distribute LPG

Description of the obstacle. If a company holding a CRE permit to distribute LPG through plants decides to acquire new vehicles, such as new tanker trucks or cylinder-delivery trucks, it has to submit a request to CRE to update the permit title (issued as an authorisation). Companies are not allowed to use their new vehicles before CRE has authorised the updated permit. Once the authorisation is issued, CRE registers the vehicles. In order to authorise permit updates, CRE asks permit holders to provide proof of damage insurance for the vehicles and a technical report (*dictamen técnico*).

Harm to competition. Companies that hold permits to distribute LPG through plants cannot immediately use their newly acquired vehicles, such as tanker trucks and delivery trucks. According to market participants, applicants in practice often do not wait for the authorisation and use new vehicles directly after buying them, so infringing the provision.

Policymakers' objective. Ensure that the new vehicles, such as tanker trucks and delivery trucks, acquired by LPG distributors are adequate to carry out their activity.

Recommendation. The OECD recommends that companies holding permits to distribute LPG through plants should only have to notify CRE of the acquisition of new vehicles. As part of that notification, companies would need to confirm that they comply with NOM-007-SESH-2010, as well as provide each vehicle's insurance policy.

2.5.1.5. Ownership regime of LPG cylinders

Description of the obstacle. In Mexico, there are currently two types of LPG cylinders: those branded by LPG distributors; and generic, unbranded cylinders. Branded cylinders can only be filled by the distributor that branded them, while generic cylinders can be filled by any LPG distributor. Branded cylinders can be exchanged between distributors; for example, distributor A could deliver a full branded cylinder to a customer and, in exchange, accept the empty cylinder of distributor B. However, there is no regulation determining the

terms of cylinder exchange between LPG distributors. Internationally, there are two generally accepted approaches to the regulation of cylinders in the market:

- Have only branded cylinders to preserve distributors' incentives to invest in cylinder renewal and regularly exchange old cylinders for new ones, as well as to guarantee distributors' accountability following accidents.
- Have both generic and branded cylinders as it is argued that if all cylinders were branded then market participants using generic cylinders that cannot afford to brand cylinders (mostly small distributors) would have to exit the market, while potential entrants would have difficulties entering the market.

Harm to competition. The lack of regulation on cylinder exchange among distributors could favour customer lock-in. For example, a customer who bought a cylinder from distributor A might have difficulty in exchanging the empty cylinder if no other distributor will accept it. The customer would therefore be more likely repurchase gas from distributor A to avoid paying several deposits.

Policymakers' objective. Authorities in Mexico have yet to decide definitively on the final model to follow, though CRE is preparing General Administrative Provisions (Disposiciones Administrativas de Carácter General) for a cylinder-exchange programme, based upon its analysis of international experience in 11 countries. These provisions will propose a switch from the current dual regime of branded and non-branded cylinders to a branded-only system, which the CRE considers the best solution.

Recommendations. The OECD recommends issuing regulations that deal with:

- the exchange of branded cylinders;
- standard deposits for exchanges;
- the creation of cylinder-exchange centres;
- forcing distributors of branded cylinders to accept competitors' branded cylinders; and
- preventing distributors of branded cylinders from holding competitors' cylinders.

The OECD makes no recommendation as to whether a branded or a generic system is preferable as this seems to be a security, not a competition issue. However, if the Mexican authorities do decide in favour of a branded-cylinder system, the OECD recommends the introduction of a transition period so as not to impose unnecessarily high costs on small distributors currently operating with unbranded cylinders.

2.5.1.6. Partial filling of LPG cylinders, known as picteleo

Description of the obstacle. In August 2017, ASEA issued an emergency NOM that established the requirements and minimum specifications for industrial and operational safety for the total or partial refilling of portable pressurised cylinders at LPG service stations. Prior to the issuance of ASEA's NOM, there was no regulation and LPG service stations had commonly been totally or partially filling cylinders. The practice of partial cylinder filling, known as *picteleo*, has been a long-standing practice in Mexico, since many low-income households cannot afford to buy full cylinders. As of August 2018, not a single service station in the entire country had complied with ASEA's NOM.

Harm to competition. According to market participants, complying with some of the NOM's stricter requirements would lead to excessive costs for LPG service stations. Such

excessive requirements incentivise the illegal total or partial filling of cylinders at LPG service stations as companies complying with the NOM are seriously disadvantaged in comparison to competitors ignoring it.

Policymakers' objective. Ensure that LPG service stations fill portable cylinders under safe conditions.

Recommendation. The OECD recommends reassessing safety conditions and taking into account international standards. In order to prevent illegal practices, introduce fines to guarantee that service stations that fill cylinders comply with the NOM. The OECD encourages ASEA to continue its ongoing work on revising the NOM.

2.5.2.7. Inspection system for LPG cylinders

Description of the obstacle. NOM-011/1-SEDG-1999 sets minimum safety conditions for the portable containers – cylinders weighing less than 25 kg – in which LPG is distributed. It contains specifications for marking these cylinders so their distributors are traceable. Companies must visually inspect every cylinder before it is filled with LPG and cylinders with possible dents, incisions, holes and corrosion should no longer be used. The NOM foresees that at distribution storage facilities where, on average, fewer than 1 000 cylinders are filled a day, 10% of cylinders should be checked daily by the distributor. For distribution storage facilities where, on average, more than 1 000 cylinders are filled a day, 200 cylinders must be inspected daily.

Harm to competition. The provision's difference in the number of cylinder inspections discriminates against storage facilities filling more than 2 000 cylinders a day. For instance, if at storage facility A, 950 cylinders are filled a day, 95 cylinders (10%) would have to be inspected. If at storage facility B, 1 050 cylinders are filled a day, 200 cylinders would have to be inspected (19.05%). It would therefore be significantly more costly for storage facility B to comply with the inspection requirement. It is not clear why a higher number of cylinders filled requires a higher percentage of inspections.

Policymakers' objective. To ensure that LPG cylinders do not constitute a danger to people who handle them.

Recommendation. The OECD recommends introducing an inspection system that is more gradual in the percentages of cylinders needing to be inspected. For instance, a system could be introduced that requires a storage facility where fewer than 2 000 cylinders are filled a day to inspect 10%, while for facilities where more than 2 000 cylinders are filled a day, a total of 200 (or a certain percentage below 10%) should be inspected.

2.5.2.8. Lack of a PROFECO NOM to deal specifically with the verification of LPG cylinders' net content

Description of the obstacle. NOM-002-SCFI-2011 deals with the verification of the net content of pre-bottled products, including both soft-drinks bottles and LPG cylinders. There is no PROFECO norm that details specifically how to verify the content of LPG cylinders.

Harm to competition. The lack of a specific NOM for LPG cylinders could leave PROFECO with too much discretion when verifying cylinders' contents and might potentially put some LPG distributors at a disadvantage; for example, if PROFECO takes a decision more favourable to one distributor than another despite similar situations. A more detailed, specific NOM would prevent this.

Policymakers' objective. The NOM seeks to guarantee that customers of pre-bottled products receive the net content for which they have paid.

Recommendation. The OECD recommends the issuance of a NOM that deals specifically with the verification of the net content of LPG cylinders. It should take account of existing international standards, in order not to generate barriers to entry.

2.5.2. Natural gas

2.5.2.1. Duration of CRE permits for natural-gas related activities

Description of the obstacle. The following natural-gas-related activities require a permit from CRE: processing of natural gas; export of natural gas; transport, storage, distribution, compression, decompression, liquefaction, regasification, commercialisation, retail sales, and management of integrated systems. (Letter XXXVI of Article 4 of the Hydrocarbons Law defines integrated systems as systems for the transport of gas through pipelines and its storage grouped together for tariff purposes and with general conditions for the provision of services, allowing for the operational co-ordination between different infrastructures.) All these types of permits, with the exception of SENER permits to export natural gas, can be granted for up to 30 years, and can be extended once for up to half of their original duration. Each CRE permit can therefore be valid for a total of up to 45 years. According to CRE, the same duration of permit is granted for the same type of permit for all permit applicants and no discrimination takes place. However, as guidelines do not exist, it would theoretically be possible for CRE and SENER to grant permits for the same activity with different durations to different applicants.

Harm to competition. The duration of permits might pose competition concerns as, due to the lack of guidelines, authorities could theoretically discriminate between applicants in a same activity by granting permits with different durations to different applicants. A competitor having to renew a permit with a shorter duration would have to bear additional costs in comparison to a competitor holding a permit with a longer duration. It seems, however, that in practice no discrimination between competitors has taken or is taking place.

Policymakers' objective. The requirement to apply for a permit aims to ensure that holders fulfil all requirements necessary to carry out the activities in question correctly. The duration of each permit should depend on the length of time that it seems reasonable to allow before re-evaluating if all requirements are still being fulfilled.

Recommendation. The OECD recommends that CRE issues guidelines for determining the duration of natural-gas-related permits depending on the specific activity in order to give more transparency to market participants.

2.5.2.2. Exchange of information with PEMEX Etileno

Description of obstacle. PEMEX Etileno is a PEMEX subsidiary that produces, distributes and commercialises derivatives of methane (the main component of natural gas). PEMEX Etileno's management responsibilities (*gerencia de comercialización*) include being in contact with industrial associations and petrochemical producers to exchange information about the markets in which PEMEX Etileno is active, as well as to find new business and investment projects and opportunities. The provision does not specify the scope of the market information to be exchanged.

Harm to competition. This provision may facilitate collusion since it states that PEMEX Etileno should co-ordinate with producers, distributors and retailers of methane.

Policymakers' objective. The objective of the provision is to allow PEMEX Etileno to acquire market information that will aid it in the planning of new investment projects or conducting its business.

Recommendation. The OECD recommends clarifying the legislation that PEMEX Etileno must take into account letter V, Article 53 of the Ley Federal de Competencia Económica and COFECE's guidelines on information exchange (Guía 007/2015: Guía para el Intercambio de Información entre Agentes Económicos),[143]) which offer guidance on how COFECE evaluates the exchange of information between economic agents.

2.5.3. Regulation affecting both natural gas and LPG at the downstream level

2.5.3.1. One-stop shop (ventanilla única)

Description of obstacle. There is no one-stop shop through which market participants can deal with authorities in the natural-gas and LPG sectors.

Harm to competition. Participants in the natural-gas and LPG sectors have to apply to and deal separately with ASEA, CRE and CNH. Industry participants have reported that sometimes it is unclear which agency has authority and which should be contacted; there can also be double controls, leading to companies having to provide the same information twice.

Policymakers' objective. In its 2017 report *Driving Performance of Mexico's Energy Regulators*, the OECD recommended establishing "a constituency that can work on a co-ordinated approach to supporting administrative simplification as well as enforcement and inspection in the sector, to create synergies between regulators and minimise cost for the regulated industry".[144] ASEA, CRE and CNH have been working on a one-stop shop, and say that they have made progress. Indeed, in early 2018, the three agencies decided to create the Office of Coordinated Assistance to the Energy Sector (Oficina de Asistencia Coordinada del Sector Energético, ODAC), which aims to provide assistance to companies in processes involving more than an energy regulator. According to CRE, ODAC is a first step towards the creation of a one-stop shop.

Recommendation. The OECD recommends introducing a one-stop shop for procedures related to ASEA, CRE and CNH, and possibly also SENER and SAT.

2.5.3.2. Co-ordinated inspections of CRE and ASEA

Description of obstacle. Companies that operate in the LPG and natural-gas sectors are subject to verification inspections (*visitas de verificación*) by CRE and ASEA. According to market participants, while legislation clearly establishes the powers of the two authorities – namely, CRE regulates the midstream and downstream sectors of hydrocarbons to promote the efficient development of the industry, while ASEA oversees industrial and operational safety and environmental protection along the entire hydrocarbons value chain – in practice, there seems to be some overlap in the requirements demanded by authorities during verification visits. To the best of the OECD's understanding, only CRE has guidelines to carry out verification visits (Acuerdo por el que la Comisión Reguladora de Energía expide los criterios y la metodología para determinar las visitas de verificación o inspección que deberán llevarse a cabo, published in the DOF, 11 November 2016). CRE's

methodology is based on OECD's 2014 report *Regulatory Enforcement and Inspections*.[145] No similar ASEA guidelines were found.

Harm to competition. Due to ASEA's lack of guidelines, it is difficult to verify if market participants' claims of overlapping requirements during CRE and ASEA inspection visits (*visitas de verificación*) are true. If they are, companies operating in the LPG and natural-gas sectors might be incurring double costs for double requirements. This could have a higher impact on small companies as verification costs might account for a higher share of their overall costs.

Policymakers' objective. There appears to be a lack of co-ordination between ASEA and CRE when carrying out inspection visits. One of the recommendations in OECD's 2017 report *Driving Performance of Mexico's Energy Regulators* was: "Ensure that overlaps are kept to the bare minimum among agencies by clarifying and aligning their goals and priorities and publicly communicate on these priorities."[146] CRE points out it created, together with ASEA and CNH, the Oficina de Asistencia Coordinada del Sector Energético (ODAC), which aims to co-ordinate processes involving more than one energy regulator. CRE states that it already made one joint verification visit with ASEA in 2017. Finally, it claims that the two agencies' verification visits serve different purposes.

Recommendation. The OECD recommends issuing guidelines for co-ordinated inspection visits by CRE and ASEA, as well as establishing an interagency body between CRE and ASEA to help co-ordinate visits. While CRE and ASEA's inspections do not serve the same purposes, some overlap might exist that would allow for joint inspection visits.

2.5.3.3. Independent third parties to assure compliance with law

Description of obstacle. ASEA uses independent third parties for supervision, surveillance, assessment, investigation and auditing of the General Administrative Provisions (Disposiciones Administrativas de Carácter General, DACG) that it issues. These "third parties in the matters of industrial safety, operational safety and protection of the environment in the hydrocarbons sector" are corporate entities (*personas morales*) and a requirement for companies operating in the LPG and natural-gas sectors. Applicants for authorisation to become third parties must, among other requirements, present their previous year's tax declaration, take out civil-responsibility insurance, have a quality system that meets the ISO 9001 international standard or equivalent, and sign a non-conflict-of-interest declaration. Furthermore, applicants must comply with the technical requirements specific to the regulation in question. ASEA runs calls for corporate entities interested in becoming third parties, which are published in the National Official Gazette (Diario Oficial de la Federación, DOF). As of 12 March 2018, ASEA had run nine calls; these remain open to the public, so interested parties can apply at any time. Nevertheless, market participants claim that the limited number of authorised third parties leads to high fees for their services; according to some market participants, as much as eight times as high in comparison to non-authorised third parties.

Harm to competition. Competition between authorised third parties is limited because there are currently too few active in the market. Contracting them can be costly for companies in the LPG and natural-gas sectors.

Policymakers' objective. ASEA uses independent third parties to ensure compliance with regulations for industrial and operative safety and environmental protection. According to ASEA, the low number of third parties is due to a lack of suitable candidates.

Recommendation. The OECD recommends taking additional measures to increase the number of ASEA-authorised third parties in the market. These measures could include re-evaluating the conditions for authorising third parties and more widely publicising the calls for third parties.

2.5.3.4. Natural-gas and LPG price-comparison tool for residential consumers

Description of obstacle. No easily accessible database enabling residential consumers to compare LPG and natural-gas prices currently exists. According to sector participants, natural-gas prices for residential consumers can be up to 15-20% lower than LPG prices; however, there is low diffusion or knowledge of price differences among consumers.

Harm to competition. Residential consumers do not have easy access to price comparisons of LPG and natural gas, so might not take optimal decisions.

Policymakers' objective. CRE states that it is currently working on a tool to compare end-consumer prices for LPG and natural gas.

Recommendation. The OECD recommends introducing a tool (such as a website or an app) that enables residential consumers to compare the prices of LPG and natural gas in their area. Information published in the tool should be presented in an aggregated form (i.e. average price in that area) to prevent the tool leading to illegal information exchange and co-ordination among distributors.

2.5.3.5. Non-harmonised standards

Description of the obstacle. In its review of the downstream gas sector, OECD found 22 NOMs that specifically state that they are not in line with international norms. These were:

- NOM-001-SESH-2014, setting the minimum technical and safety requirements for the design and construction of LPG distribution plants.
- NOM-002-SECRE-2010, setting the minimum safety requirements to be met in natural-gas facilities.
- NOM-002-SESH-2009, setting the minimum safety requirements to be met in storage facilities for LPG distribution.
- NOM-003-ASEA-2016, setting the specifications and technical criteria for the industrial and operative safety and the environment protection of pipeline distribution systems for natural gas and LPG.
- NOM-003-SEDG-2004, setting the minimum technical safety requirements for the design and construction of LPG fuelling stations with fixed storage facilities.
- NOM-004-SEDG-2004, setting the minimum safety requirements to be met in the design, construction and modification of fixed and permanent LPG facilities.
- NOM-005-SESH-2010, setting the minimum safety requirements, specifications and testing methods to be met by the LPG fuel systems for internal combustion engines.
- NOM-006-SESH-2010, setting the minimum technical requirements at mechanical workshops for fuelling LPG equipment.

- NOM-007-SESH-2010, setting the minimum conditions for the safety, operation and maintenance of vehicles that transport and distribute LPG.
- NOM-009-SESH-2011, setting the minimum specifications for the design and manufacturing of non-transportable LPG containers and deposits for the transport or distribution of LPG through tanker trucks, trailers and semi-trailers.
- NOM-010-SESH-2012, the minimum safety requirements for domestic cooking equipment that uses LPG or natural gas.
- NOM-011/1-SEDG-1999, setting the minimum safety conditions for portable containers used to distribute LPG.
- NOM-011-SECRE-2000, setting the minimum safety requirements for motor vehicles that use compressed natural gas as fuel.
- NOM-011-SESH-2012, setting the minimum safety requirements and specifications, for domestic and commercial water heaters that use LPG or natural gas as fuel.
- NOM-012-SESH-2010, setting the minimum safety requirements for domestic room heaters that use LPG or natural gas as fuel.
- NOM-013-SEDG-2002, setting the evaluation methods using ultrasonic measurement of the thickness of the cylindrical section and caps of non-portable containers of LPG.
- NOM-014-SESH-2013, setting the specifications of the integrated or flexible connections used in natural-gas and LPG facilities.
- NOM-015-SESH-2013, setting the standards for low-pressure LPG regulators.
- NOM-016-CRE-2016, setting the quality guidelines to be met by oil products in each stage of the value chain.
- NOM-042-SEMARNAT-2003, setting the maximum allowed emissions from the exhaust systems of vehicles with a gross weight under 3 857 kg fuelled by gasoline, LPG, natural gas and other fuels.
- NOM-047-SEMARNAT-2014, setting the procedure for the verification of maximum permitted emissions from vehicles powered by gasoline, LPG, natural gas or other fuels.
- NOM-076-SEMARNAT-2012, setting maximum permitted emissions from the exhaust systems of vehicles with a gross weight over 3 857 kg powered by gasoline, LPG, natural gas or other fuels.

Harm to competition. Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.

Policymakers' objective. In Mexico, non-harmonisation of NOMs must be disclosed, according to letter VI, Article 41 of the Federal Law on Metrology and Standardisation,

which states that NOMs must contain a degree of concordance with international norms and criteria.

Recommendation. The OECD recommends updating all NOMs so that they are in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist equivalent international standards or best practices. The *National Standardisation Programme for 2018* mentions that 4 of these NOMs are in the process of being modified (NOM-001-SESH-2014, NOM-002-SESH-2009, NOM-003-SEDG-2004 and NOM-007-SESH-2010) and 12 will be cancelled or replaced (NOM-002-SECRE-2010, NOM-004-SEDG-2004, NOM-005-SESH-2010, NOM-006-SESH-2010, NOM-009-SESH-2011, NOM-011/1-SEDG-1999, NOM-011-SESH-2012, NOM-013-SEDG-2002, NOM-014-SESH-2013, NOM-016-CRE-2016, NOM-042-SEMARNAT-2003 and NOM-047-SEMARNAT-2014).

Notes

[1] The Sistema de Clasificación Industrial de América del Norte or SCIAN (known as the North American Industry Classification System or NAICS in the United States and Canada) was developed jointly by the United States, Canada and Mexico to facilitate the comparison of business statistics between the three countries. Nevertheless, differences between certain SCIAN codes in Mexico and those in the United States and Canada remain. For natural gas, this report focuses on SCIAN groups 21, 22, 32 and 48, including the relevant subgroups. For the extraction of natural gas, the main category is SCIAN 21 "mining" and includes the following subcategories: SCIAN 211110 "extraction of oil and gas" (i.e. establishments engaged in the extraction of oil and crude hydrocarbons in gaseous state, e.g. natural gas) and SCIAN 213111 "oil and gas well drilling". Overall category SCIAN 22, "Generation, transmission and distribution of electricity, piped water and gas supply to the final consumer", contains the following subcategory: SCIAN 222210 "[natural] gas supply via pipeline to final consumers". General category SCIAN 32, "manufacturing industries", covers subcategory SCIAN 325110 "basic petrochemical products manufacturing from natural gas and refined petroleum", i.e. establishments primarily engaged in the manufacturing of acyclic hydrocarbons – ethylene, propylene and butylene – and aromatic cyclic hydrocarbons, namely, benzene, toluene, xylene and styrene, from natural gas, liquid hydrocarbons – liquid natural gas and natural gasoline – and refined petroleum. General category SCIAN 48, "Transportation, post and storage", covers the subcategories SCIAN 483113, "maritime transportation of oil and natural gas" (i.e. establishments primarily engaged in the transportation of crude oil and natural gas by sea, whether ocean or short sea shipping); SCIAN 486210, "natural gas transportation via pipelines"; and SCIAN 486910, "pipeline transportation of refined petroleum products" (i.e. establishments mainly engaged in the transportation of refined petroleum products via pipelines, such as refined oil, natural-gas liquids, gasoline and the transportation of other non-classified refined petroleum products).

[2] For LPG, the report focuses on SCIAN groups 21, 22, 32, 43 and 46, including the relevant subgroups. For gas extraction, the main category SCIAN 21, "mining", covers the following subcategories: SCIAN 211110 "extraction of oil and gas" (i.e. companies engaged in the extraction of oil and crude hydrocarbons in a gaseous state) and SCIAN 213111, "oil and gas well drilling". The main category SCIAN 22, "Generation, transmission and distribution of electricity, piped water and gas supply to the final consumer", covers subcategory SCIAN 222210, "gas supply via pipeline to final consumers". Overall category SCIAN 32, "manufacturing industries", covers subcategory SCIAN 324110, "oil refining" (i.e. establishments primarily engaged in the refining of crude oil). The main category SCIAN 43, "wholesale", covers the subcategory SCIAN 434230, "wholesale of fuels for industrial use". Finally, the main category SCIAN 46, "retail", covers SCIAN 468412,

"retail of LPG in cylinders and for stationary tanks", and SCIAN 468413, "retail of LPG in carburation stations".

[3] Article 4, letter XVII of the Hydrocarbons Law (published in DOF on 11 August 2014).

[4] Article 4, letter XVI of the Hydrocarbons Law.

[5] IEA (2017), *Energy Policies Beyond IEA Countries: Mexico 2017*, www.iea.org/publications/freepublications/publication/EnergyPoliciesBeyondIEACountriesMexico2017.pdf (accessed on 24 July 2018), p.23.

[6] Ibid., pp.9 & 23.

[7] Bahadori A., (2014), Chapter 1, *Natural Gas Processing: Technology and Engineering Design*, Elsevier, Amsterdam.

[8] Ibid, p.7.

[9] EIA (2015), *Technically Recoverable Shale Oil and Shale Gas Resources: Mexico*, www.eia.gov/analysis/studies/worldshalegas/pdf/Mexico_2013.pdf (accessed on 24 July 2018).

[10] For instance, on 13 October 2016, according to a December 2017 article in *Forbes México*, CNH approved, without a legal framework, fracking activities in five areas: Miquetla, Miahuapan, Soledad, Amatitlán, and Pitepec in Veracruz. (www.forbes.com.mx/gas-shale-un-mal-negocio-para-mexico, accessed on 24 July 2018.)

[11] CNH (2017), *Gaceta Trimestral* (Enero-Marzo 2017: 10), www.gob.mx/cms/uploads/attachment/file/236525/Gaceta_010_web.pdf (accessed on 24 July 2018).

[12] United Nations Statistics Division (April 2018), *Guidelines for the 2016 United Nations Statistics Division: Annual Questionnaire on Energy Statistics*, https://unstats.un.org/unsd/energy/Energy-Questionnaire-Guidelines.pdf (accessed on 24 July 2018).

[13] Abdel-Aal, H.K. (n.d.), "Natural gas processing", National Research Center (NRC), Cairo, Egypt, www.eolss.net/sample-chapters/c08/e6-185-10.pdf (accessed on 24 July 2018).

[14] CNIH, "Producción nacional de petróleo y gas", https://portal.cnih.cnh.gob.mx/downloads/es_MX/estadisticas/Producci%C3%B3n%20nacional%20de%20petr%C3%B3leo%20y%20gas.pdf (accessed on 24 July 2018)

[15] SENER (2017a), *Prospectiva de gas natural 2017-2031*, www.gob.mx/cms/uploads/attachment/file/286233/Prospectiva_de_Gas_Natural_2017.pdf (accessed on 24 July 2018).

[16] In addition, PEMEX had exclusive rights to produce basic petrochemicals and LPG and sell such hydrocarbon products at the retail level.

[17] See Articles 6-10 of the Hydrocarbons Law. With an assignment, the Federal Executive grants an SPE the exclusive right to explore and extract hydrocarbons in an assigned area for a specific period of time.

[18] Article 15 of the Hydrocarbons Law.

[19] Article 18 of the Hydrocarbons Law.

[20] Lexoil Consultores, "Contratos para la Exploración y Explotación de hidrocarburos", www.lexoil.com.mx/uncategorized/contratos-para-la-exploracion-y-explotacion-de-hidrocarburos/ (accessed on 24 July 2018).

[21] Ibid.

[22] PwC (2014), "Reforma Energética Resumen del proyecto de decreto que expide las leyes secundarias en materia de hidrocarburos", www.pwc.com/mx/es/industrias/archivo/2014-05-secundarias-hidrocarburos.pdf (accessed on 24 July 2018).

[23] Lexoil Consultores, "Contratos para la Exploración y Explotación de hidrocarburos".

[24] See https://rondasmexico.gob.mx/cnh-cifra-inicio (accessed on July 24, 2018)

[25] The legal basis for this award was the sixth transitory article of the Decree for Mexican Constitution Reform in Energy Matters (Decreto por el que se reforman y adicionan diversas disposiciones de la Constitución Política de los Estados Unidos Mexicanos, en Materia de Energía), published in DOF on 20 December 2013.

[26] On 13 August 2014, SENER granted PEMEX 489 assignments: 108 for exploration, 286 for extraction and 95 assigned temporarily (i.e. until the Mexican state tenders them) for production fields. SENER (2017b), *Plan quinquenal de Licitaciones para la Exploración y Extracción de Hidrocarburos 2015-2019*, www.gob.mx/cms/uploads/attachment/file/196169/Plan_Quinquenal_2017_vf.pdf (accessed on 24 July 2018). In total, PEMEX was granted 34 800 million barrels of crude oil equivalent (boe) in prospective resources or 31% of total prospective resources; and 20 589 mboe in 2P reserves, which then represented 83% of total 2P reserves, www.gob.mx/cms/uploads/attachment/file/55590/Ficha_tecnica_R0.pdf (accessed on 24 July 2018).

[27] SENER (2017b), *Plan quinquenal de Licitaciones para la Exploración y Extracción de Hidrocarburos 2015-2019*, www.gob.mx/cms/uploads/attachment/file/196169/Plan_Quinquenal_2017_vf.pdf (accessed on 24 July 2018).

[28] Ibid.

[29] Estimated with information from Tenders and Contracts (Licitaciones y Contratos) at https://portal.cnih.cnh.gob.mx/estadisticas.php (accessed on 24 July 2018).

[30] Winners of the **First Call of Round One** were: 1) Sierra Oil & Gas, Talos Energy and Premier Oil; and 2) Sierra Oil & Gas, Talos Energy and Premier Oil. **Second Call**: 1) Eni International; 2) Pan American Energy with E&P, and 3) Pokoch Fieldwood Energy with Petrobal. **Third Call**: 1) Diavaz Offshore; 2) Sistemas Integrales de Compresión with Nuvoil and Constructora Marusa; 3) Consorcio Manufacturero Mexicano; 4) Grupo Diarqco; 5) Strata Campos Maduros; 6) Diavaz Offshore; 7) Poniente Servicios de Extracción Petrolera Lifting de México; 8) Construcciones y Servicios Industriales Globales; 9) Compañía Petrolera Perseus; 10) Geo Estratos with Geo Estratos Mxoil Exploración y Producción; 11) Renaissance Oil Corp; 12) Consorcio Manufacturero Mexicano; 13) Grupo Diarqco; 14) Canamex Dutch with Perfolat de México and American Oil Tools; 15) Renaissance Oil Corp; 16) Roma Energy Holdings with Tubular Technology and Gx Geoscience Corporation; 17) Geo Estratos, with Geo Estratos Mxoil Exploración y Producción; 18) Strata Campos Maduros; 19) Geo Estratos, with Geo Estratos Mxoil Exploración y Producción; 20) Strata Campos Maduros; 21) Sarreal; 22) Grupo R Exploración y Producción with Constructora y Arrendadora México; 23) Compañía Petrolera Perseus; 24) Geo Estratos with Geo Estratos Mxoil Exploración y Producción; 25) Renaissance Oil Corp. **Fourth Call**: 1) China Offshore Oil Corporation E&P Mexico; 2) Total and ExxonMobil; 3) Chevron, Pemex and Inpex; 4) China Offshore Oil Corporation E&P Mexico; 5) Statoil, BP and Total; 6) Statoil, BP and Total; 7) PC Carigali and Sierra; 8) Murphy, Ophir, PC Carigali and Sierra. See "Resultados de la Licitación de Contratos para la Extracción de Hidrocarburos correspondientes a la Segunda Convocatoria de la Ronda Uno", www.gob.mx/sener/prensa/resultados-de-la-licitacion-de-contratos-para-la-extraccion-de-hidrocarburos-correspondientes-a-la-segunda-convocatoria-de-la-ronda-uno (accessed on 24 July 2018); "Resultados de la Tercera Convocatoria de la Ronda Uno", www.gob.mx/sener/prensa/resultados-de-la-tercera-convocatoria-de-la-ronda-uno (accessed on 24 July 2018); and http://rondasmexico.gob.mx/l04-ap-seguimiento-y-transparencia/#resultado (accessed on 24 July 2018).

[31] Winners of the **First Call of Round Two** were: 1) DEA Deutsche and PEMEX; 2) PC Carigali and Ecopetrol Global; 3) ENI México, Capricorn Energy and Citla Energy; 4) PEMEX and Ecopetrol; 5) Capricorn Energy and Citla Energy E&P; 6) ENI México; 7) Repsol Exploración and Sierra Perote; 8) Lukoil International Upstream Holding; 9) ENI México and Citla Energy; and 10) Total E&P México and Shell Exploración. **Second Call:** 1) Iberoamericana and PJP4; 2) Sun

God and Jaguar; 3) Sun God and Jaguar; 4) Sun God and Jaguar; 5) Sun God and Jaguar; 6) Sun God and Jaguar; 7) Sun God and Jaguar. **Third call:** 1) Iberoamericana and PJP4; 2) Newpek and Verdad Exploration; 3) Newpek and Verdad Exploration; 4) Iberoamericana and PJP4; 5) Jaguar Exploración y Producción; 6) Shandong, Sicoval and Nuevas Soluciones; 7) Jaguar Exploración y Producción; 8) Jaguar Exploración y Producción; 9) Jaguar Exploración y Producción; 10) Shandong, Sicoval and Nuevas Soluciones; 11) Shandong, Sicoval and Nuevas Soluciones; 12) Carso Oil and Gas; 13) Carso Oil and Gas; and 14) Jaguar Exploración y Producción. **Fourth call:** 1) Shell and Pemex; 2) Shell and Qatar Petroleum; 3) Shell and Qatar Petroleum; 4) PEMEX Exploración y Producción; 5) Shell and Qatar Petroleum; 6) Shell and Quatar Petroleum; 7) Repsol, PC Carigali and Ophir; 8) PC Carigali, Ophir and PTTEP; 9) Repsol and PC Carigali; 10) PEMEX Exploración y Producción; 11) Shell Exploracion y Extraccion de Mexico; 12) Shell Exploracion y Extraccion de Mexico; 13) Chevron, PEMEX and Inpex; 14) Shell Exploracion y Extraccion de Mexico; 15) Eni and Qatar Petroleum; 16) PC Carigali Mexico Operations; 17) PC Carigali Mexico Operations; 18) Shell Exploracion y Extraccion de Mexico; and 19) Repsol, PC Carigali, Sierra and PTTEP. Ronda 2, Licitación 1: https://rondasmexico.gob.mx/wp-content/uploads/2017/06/Resultados.pdf; Ronda 2, Licitación 2: https://rondasmexico.gob.mx/wp-content/uploads/2017/07/Resultados.pdf; Ronda 2, Licitación 3: https://rondasmexico.gob.mx/wp-content/uploads/2017/07/Resultados_b.pdf; Ronda 2, Licitación 4: https://rondasmexico.gob.mx/wp-content/uploads/2018/01/r24_reporte_ganadores.pdf (all accessed on 24 July 2018).

[32] Prospective resources are quantities of hydrocarbons that are estimated, at a given date, to be potentially recoverable from undiscovered accumulations. There is an associated chance of discovery and a chance of development. See, www.erinenergy.com/investors/glossary/default.aspx (accessed on 24 July 2018).

[33] Total prospective resource estimation according to SENER, "Resultados de la Primera Convocatoria de la Ronda Dos", www.gob.mx/sener/articulos/resultados-de-la-primera-convocatoria-de-la-ronda-dos-112597?idiom=es; "Resultados de la Segunda y Tercera Convocatorias de la Ronda Dos", www.gob.mx/sener/prensa/resultados-de-la-segunda-y-tercera-convocatorias-de-la-ronda-dos; "Resultados de la Cuarta Convocatoria de la Ronda Dos", www.gob.mx/sener/prensa/resultados-de-la-cuarta-convocatoria-de-la-ronda-dos; and Zarrabal García, Raúl, "Se firman 10 contratos de la Ronda 2.1" http://implementaciondelareformaenergetica.com/se-firman-10-contratos-de-la-ronda-2-1/ (all accessed on 24 July 2018).

[34] CNH, "Comunicado de Prensa 032 Emitido por SENER, SHCP y CNH", www.gob.mx/cnh/prensa/comunicado-de-prensa-032-emitido-por-sener-shcp-y-cnh (accessed on 24 July 2018).

[35] SENER, "Segunda convocatoria de la Ronda 3 y actualización del Plan Quinquenal", www.gob.mx/sener/articulos/segunda-convocatoria-de-la-ronda-3-y-actualizacion-del-plan-quinquenal (accessed on 24 July 2018).

[36] Winners of the **First Call of Round Three** were: 1) Repsol; 2) Premier; 3) Repsol; 4) Premier; 5) Capricorn and Citla; 6) PEMEX, Deustche [sic] and Compañía Española; 7) PEMEX, Deustche [sic] and Compañía Española; 8) PEMEX and Compañía Española; 9) Eni and Lukoil; 10) PEMEX; 11) Deutsche [sic], Premier and Sapura; 12) Pan American; 13) Total and PEMEX; 14) Total and PEMEX; 15) Total, BP and Pan American; and 16) Shell and PEMEX. See "Boletín de prensa 016/2018", www.gob.mx/cms/uploads/attachment/file/312985/02_ABRIL_2018_BOLETIN_DE_PRENSA_016-FALLO_GANADORES_R3L1__2_ABRIL_2018_.pdf (accessed on 24 July 2018).

[37] SENER (2017a). See also, Dirección General de Gas Natural y Petroquímicos (n.d.), "Gas Natural", www.gob.mx/cms/uploads/attachment/file/12459/Documento_Gas_Natural_2015.pdf (accessed on 24 July 2018).

[38] NGL should not be confused with liquefied natural gas (LNG). LNG is natural gas that has been converted into liquid to allow easier and safer storage or transport.

[39] See Disposiciones administrativas de carácter general que establecen los formatos y especificaciones de los requisitos a que se refieren los artículos 50, 51 y 121 de la Ley de Hidrocarburos para el otorgamiento de permisos en materia de tratamiento y refinación de petróleo, así como de procesamiento de gas natural (published in DOF on 1 October 2015), http://dof.gob.mx/nota_detalle.php?codigo=5410079&fecha=01/10/2015 (accessed on 24 July 2018) and Disposiciones administrativas de carácter general que establecen los modelos de los títulos de permisos en materia de tratamiento y refinación de petróleo, así como de procesamiento de gas natural (published in DOF on November 19, 2015), http://dof.gob.mx/nota_detalle.php?codigo=5416022&fecha=19/11/2015 (accessed on 24 July 2018).

[40] According to Article 48 of the Hydrocarbons Law (published in DOF on 11 August 2014) and Article 4 of the Regulation on the Activities Referred to by the Third Title of the Hydrocarbons Law (published in DOF on 31 October 2014).

[41] In 2015, PEMEX received permits for gas-processing plants in the following locations: Arenque, Burgos, Cactus, Ciudad Pemex, Coatzacoalcos, La Venta, Matapionche, Nuevo Pemex and Poza Rica. See SENER (2016a). See permit titles in www.gob.mx/sener/articulos/titulos-de-permiso-de-procesamiento-de-gas-natural (accessed on 24 July 2018).

[42] Mongillo, J. F. (2011), *A Student Guide to Energy*, 5 volumes, Greenwood, Santa Barbara, CA, p.85.

[43] Zúñiga, N., "Impactará PEMEX en precios de gas LP", *Reforma*, 13 December 2016, www.reforma.com/aplicacioneslibre/articulo/default.aspx?id=1003727&md5=d05fdcd14218aa03f0138b272b9e4ebf&ta=0dfdbac11765226904c16cb9ad1b2efe&po=4 (accessed on 24 July 2018).

[44] SENER (2017a), pp.56-57.

[45] Resolución por la que la Comisión Reguladora de Energía expide las disposiciones administrativas de carácter general en materia de acceso abierto y prestación de los servicios de transporte por ducto y almacenamiento de gas natural, RES/900/2015 (published in DOF on 13 January 2016), http://dof.gob.mx/nota_detalle.php?codigo=5422585&fecha=13/01/2016 (accessed on 24 July 2018).

[46] Dirección General de Gas Natural y Petroquímicos, "Prontuario estadístico", www.gob.mx/cms/uploads/attachment/file/224263/Prontuario_gas_natural_mayo_2017.pdf (accessed on 24 July 2018).

[47] IEA (2017), p.120.

[48] Articles 48 and 66 of the Hydrocarbons Law and article 84 of the Regulation on the activities to which it refers the Third Title of the Hydrocarbons Law (published in DOF on 31 October 2014).

[49] CENAGAS, "CENAGAS y SISTRANGAS", www.gob.mx/cenagas/acciones-y-programas/cenagas-y-sistrangas-128579 (accessed on 24 July 2018) and SENER (2017a).

[50] Haynesboone, "Open Seasons for Natural Gas and Fuels in Mexico", 2 December 2016, www.haynesboone.com/alerts/open-seasons-for-natural-gas-and-fuels-in-mexico (accessed on 24 July 2018).

[51] SENER (2017a).

[52] SENER (2016a), *Prospectiva de Gas Natural 2016-2030*, www.gob.mx/cms/uploads/attachment/file/177624/Prospectiva_de_Gas_Natural_2016-2030.pdf (accessed on 24 July 2018).

[53] See data in CENAGAS, "Puntos de inyección y extracción", http://transparencia.cenagas.gob.mx/temporada_abierta/descargas/Relacion%20de%20los%20Puntos%20de%20Inyeccion%20y%20Extraccion.xlsx (accessed on 24 July 2018).

[54] The six peripherial systems are: 1) Reynosa-San Fernando, operated by Gasoductos de Tamaulipas; 2) Valtierrilla-Aguascalientes, operated by Gasoductos del Bajío; 3) Los Ramones-Fase I, operated by Gasoductos del Noreste; 4) Aguascalientes-Zacatecas, operated by Gasoductos del Noreste; 5) Los Ramones-Fase II-Norte, operated by TAG Pipelines Norte; and 6) Los Ramones-Fase II-Sur, operated by TAG Pipelines Sur. CENAGAS document Num. DG/009/2017 http://transparencia.cenagas.gob.mx/res/transparencia/informes/Informe%20de%20Autoevaluaci%C3%B3n%20Correspondiente%20al%20Segundo%20Semestre%20de%202016.pdf (accessed on 24 July 2018).

[55] PEMEX transferred to CENAGAS the National Gas Pipeline and the Naco-Hermosillo systems with a length of 9 000 km and a natural-gas capacity of more than 5 000 mcfpd, see www.pemex.com/saladeprensa/boletines_nacionales/Paginas/2015-099-nacional.aspx (accessed on 24 July 2018). See also CENAGAS (2015), "Capacidad Sistema Nacional de Gasoductos", www.gob.mx/cms/uploads/attachment/file/77778/SNG_NOV_15.pdf (accessed on 24 July 2018).

[56] See "Descripción General de Sistema Naco Hermosillo", www.gob.mx/cenagas/acciones-y-programas/descripcion-general-de-snh (accessed on 24 July 2018).

[57] See CRE, "Aprueba CRE cesión de los permisos de transporte de Pemex al Cenagás, otro paso histórico hacia la consolidación de la Reforma Energética, 7 April 2016", www.gob.mx/cre/prensa/aprueba-cre-cesion-de-los-permisos-de-transporte-de-pemex-al-cenagas-otro-paso-historico-hacia-la-consolidacion-de-la-reforma-energetica?idiom=es (accessed on 24 July 2018).

[58] SENER (2016b), *Política pública para la implementación del mercado de gas natural*, www.gob.mx/cms/uploads/attachment/file/116754/1._Pol_tica_P_blica_MGN.pdf (accessed on 24 July 2018) p.14.

[59] Point 1.6 of the Resolución por la que la Comisión Reguladora de Energía expide las disposiciones administrativas de carácter general en materia de acceso abierto y prestación de los servicios de transporte por ducto y almacenamiento de gas natural, RES/900/2015.

[60] Article 71 of the Hydrocarbons Law.

[61] Resolución por la que la Comisión Reguladora de Energía expide las disposiciones administrativas de carácter general en materia de acceso abierto y prestación de los servicios de transporte por ducto y almacenamiento de gas natural, RES/900/2015.

[62] See, for example, http://drive.cre.gob.mx/Drive/ObtenerPermiso/?id=21037 (accessed on 24 July 2018).

[63] These are: Almacenamiento Subterraneo del Istmo; Energía Costa Azul; Terminal de LNG de Altamira; and Terminal KMS de GNL.

[64] Permit holders were: 1) Transportadora de Gas de Trancoso; 2) Abent 3T; 3) Arguelles Pipeline; 4) ATCO Pipelines; 5) CARSO Gasoducto Norte; 6) Centro Logístico Jalisco; 7) CENAGAS for the SNG and Sistema Naco-Hermosillo; 8) Compañía de Gas Natural de Santa Rosa; 9) Conceptos Energéticos Mexicanos; 10) Consumidora Industrial de Hidalgo; 11) Ductos de Nogales; 12) Empresa Prueba I; 13) Energía Infra; 14) Energía Mayakan; 15) Energía Occidente de México; 16) Fermaca Pipeline Anáhuac, with two permits; 17) Fermaca Pipeline de Occidente; 18) Fermaca Pipeline El Encino; 19) Fermaca Pipeline la Laguna; 20) Finsa Energéticos; 21) Ganfer Sociedad Agrícola; 22) Gas Natural del Noroeste with 12 permits; 23) Gas Natural Rio Blanco; 24) Gasoducto de Aguaprieta with five permits; 25) Gasoducto de Morelos; 26) Gasoducto del Río; 27) Gasoducto Rosarito; 28) Gasoductos de Chihuahua; 29) Gasoductos de Tamaulipas; 30) Gasoductos del Bajío; 31) Gasoductos del Noreste; 32) GN del Valle; 33) Hortícola Cimarrón; 34) Igasamex San José Iturbide with two permits; 35) Industrializadora de Cárnicos Strattega; 36) Industrias Derivadas del

Etileno; 37) Infraestructura Marina del Golfo; 38) Kinder Morgan Gas Natural de México; 39) Merigas Sur; 40) Midstream de México; 41) Pemex Logística with four permits; 42) Plantfort; 43) Siderúrgica De Linares; 44) TAG Pipelines Norte; 45) TAG Pipelines Sur; 46) Tarahumara Pipeline; 47) Tejas Gas de la Península; 48) Tejas Gas de Toluca; 49) Terranova Energía; 50) Transportadora de Gas Natural de Baja California; 51) Transportadora de Gas Natural de la Huasteca with three permits; 52) Transportadora de Gas Natural del Noroeste, and 53) Transportadora de Gas Zapata. The 54th firm's name was not published as it was added in 2018.

[65] Own-use transport permit holders were: 1) Abent 3T; 2) Agricola El Rosal; 3) Agricola Zarattini; 4) Agro Industrial Madero; 5) Agroindustrias Deandar de Delicias; 6) Agroindustrias Unidas de Cacao; 7) Agropecuaria Piedadense; 8) Aguas Tratadas de Minatitlán; 9) Altos Hornos de México; 10) APC Protein Company de México; 11) Arcelormittal las Truchas; 12) ASF-K de México; 13) Bimbo de Puebla; 14) Bimbo del Golfo; 15) Bimbo; 16) Bio Pappel Packaging; 17) Braskem Idesa; 18) CCL Container; 19) Celulosa de Fibras Mexicanas; 20) Celulosa de Fibras Mexicanas; 21) Cemex México; 22) Central Anáhuac; 23) Central Saltillo; 24) Cimexlana; 25) Coats de México; 26) Comercializadora de Lácteos y Derivados; 27) Comisión Federal de Electricidad; 28) Compañía de Generación Valladolid; 29) Compañía de Nitrógeno de Cantarell; 30) Cooperativa La Cruz Azul; 31) Cris-P Greenhouses; 32) Dal-Tile México; 33) Dart de Tijuana; 34) Deacero; 35) Destiladora del Valle; 36) Dynasol Elastrómeros; 37) Electricidad Águila de Altamira; 38) Electricidad Águila de Tuxpan; 39) Electricidad Sol de Tuxpan; 40) Enercitro; 41) Energía Azteca VIII; 42) Energía de Chihuahua; 43) Energía de Ramos; 44) Energía San Luis de la Paz; 45) EVM Energía del Valle de México; 46) Fermentaciones Mexicanas; 47) Flexico; 48) Flex-N-Gate México; 49) Fracsa Alloys; 50) Fuerza y Energía de Hermosillo; 51) Fuerza y Energía de Norte Durango; 52) Fuerza y Energía de Tuxpan; 53) Galvasid; 54) Global Seed Genetics; 55) Grupo Celanese; 56) Grupo Corporativo Papelera; 57) Grupo Regio Cal; 58) Grupo San Marino; 59) Guajardo Industrial; 60) Gunderson-Gimsa; 61) Hari Masa del Sureste; 62) Harinera de Veracruz; 63) Hersmex; 64) Hutchinson Autopartes México; 65) Hyundai de México; 66) Iberdrola Energía Altamira; 67) Iberdrola Energía la Laguna; 68) Iberdrola Energía Tamazunchale; 69) Industria del Alcali; 70) Industrializadora Olefinos; 71) Industrias de Hule Galgo; 72) Industrias Derivadas del Etileno; 73) Industrias Unidas; 74) Inspecciones y Pruebas No destructivas; 75) J. Cox México; 76) Kaltex Fibers; 77) Kimberly Clark de México; 78) KMG de México; 79) KST Electric Power Company; 80) La Batería Verde; 81) Manufacturas Kaltex; 82) Manufacturas Vitromex; 83) Manufacturera Lee de México; 84) Materiales del Istmo; 85) Mazda Motor Manufacturing de México; 86) Mexicana de Cobre; 87) Mexicana de Industrias y Marcas; 88) Minera Roca Rodando; 89) Molino Harinero San Blas; 90) Molinos Azteca de Chalco; 91) Molinos Azteca de Veracruz; 92) Molinos Azteca; 93) Multiservicios 2001; 94) Naturaltek; 95) Nemak México; 96) Nextbar; 97) Papelera Altamira; 98) PEMEX Exploración y Producción; 99) PEMEX Transformación Industrial; 100) Pfaltzgraff de México; 101) Pilgrim's Pride; 102) Plantfort; 103) Plásticos y Alambres; 104) Polykron; 105) Porcelanite Lamosa; 106) Praxair México; 107) Prenergy Gas; 108) Prince Erachem México; 109) Productos Alimenticios Dondé; 110) Productos Farmacéuticos; 111) Rancho Lucero; 112) Refractarios Básicos; 113) Rijk Zwaan Promex; 114) Saint-Gobain América; 115) San José y su Agricultura; 116) Schneider Electric México; 117) Siderúrgica del Golfo; 118) Sigma Alimentos Centro; 119) Sistemas Energéticos SISA; 120) Smurfit Cartón y Papel de México; 121) SuKarne Agroindustrial; 122) Techgen; 123) Technocast; 124) Teksid Hierro de México; 125) Termoeléctrica de Mexicali; 126) Ternium México; 127) Textil las Américas; 128) Thyssenkrupp Budd de Tijuana; 129) Toyota Motor Manufacturing de Baja California; 130) Tractebel Energía de Monterrey; 131) Transmisiones y Equipos Mecánicos; 132) Trinity Industries de México; 133) Tubos de Acero de México; 134) Unión Minera del Sur; 135) Univex; 136) US Antimony de México; 137) USG México; 138) Vegetales de Teotihuacán; 139) Vidriera de Tierra Blanca; 140) Vidriera Industrial del Potosí; 141) Volkswagen de México.

[66] See, for example, www.cre.gob.mx/documento/permiso/gas/G-329-TUP-2014.pdf (accessed on 24 July 2018).

[67] Holders of permits for transporting by means other than pipelines were: 1) Autotanques Nieto; 2) Comercial en Fletes México; 3) Comercial y Transporte GNC; 4) GNC Hidrocarburos;

5) Hortícola Cimarrón; 6) Igasamex Bajío; 7) KNG Ultra; 8) LM Transportaciones; 9) Neomexicana de GNC; 10) PEMEX Logística; 11) Solensa; 12) Trans-Energéticos; 13) Transportadora Fuentes; 14) Transportadora Zeta; and 15) Virtual Pipelines de México.

[68] Resolución por la que la Comisión Reguladora de Energía expide las disposiciones administrativas de carácter general que establecen los requisitos de las solicitudes para la obtención de permisos de transporte, almacenamiento, distribución, licuefacción, regasificación, compresión, decompresión, expendio al público y gestión de sistemas integrados de gas natural (RES/577/2015), www.gob.mx/cms/uploads/attachment/file/118294/RES-577-2015.pdf (accessed on 24 July 2018).

[69] García, K., "Pemex gana 59% del volumen ofertado en ductos de gas natural", *El Economista*, 8 May 2017, www.eleconomista.com.mx/empresas/Pemex-gana-59-del-volumen-ofertado-en-ductos-de-gas-natural-20170509-0046.html (accessed on 24 July 2018).

[70] CENAGAS, "CENAGAS y SISTRANGAS: Preguntas frecuentes relacionas con el CENAGAS y el SISTRANGAS", www.gob.mx/cenagas/acciones-y-programas/cenagas-y-sistrangas-83500 (accessed on 24 July 2018).

[71] Twenty projects were under construction according to the 2016 report: 1) El Encino-Topolobampo, developed by Infraestructura Energética Monarca; 2) Ramal Tula, developed by ATCO Pipelines; 3) Ramal-Villa de Reyes, developed by Gas Natural del Noroeste; 4) San Isidro-Samalayuca, developed by Gasoducto de Aguaprieta; 5) Tuxpan-Tula, developed by Transportadora de Gas Natural de la Huasteca; 6) El Encino-La Laguna, developed by Fermaca Pipeline El Encino; 7) Guaymas-El Oro, developed by Gasoducto de Aguaprieta; 8) Ojinaga-El Encino, developed by Gasoducto de Aguaprieta; 9) El Oro-Mazatlán, developed by Infraestructura Energética Monarca; 10) Tula-Villa de Reyes, developed by Transportadora de Gas Natural de la Huasteca; 11) Ramal-Hermosillo, developed by Gas Natural del Noroeste; 12) Samalayuca-Sásabe, developed by Carso Gasoductos; 13) Villa de Reyes-Aguascalientes-Guadalajara, developed by Fermaca Pipeline de Occidente; 14) La Laguna-Aguascalientes, developed by Fermaca Pipeline La Laguna; 15) Ramal-Empalme, developed by Gasoducto de Aguaprieta; 16) Sur de Texas-Tuxpan (maritime gas pipeline), developed by Infraestructura Marina del Golfo; 17) Waha-San Elizario, developed by Comanche Trail Pipeline; 18) Waha-Presidio, operated by Trans-Pecos Pipeline; 19) Webb-Escobedo, operated by Nueva Era Pipeline; and 20) Nueces-Brownsville, operated by Valley Crossing Pipeline. At the time, two projects were set to be tendered: Suministro Baja California Sur and Ramal Topolobampo.

[72] CFE (2017), *Informe Anual 2016*, http://gaceta.diputados.gob.mx/Gaceta/63/2017/may/CFE-20170508.pdf (accessed on 24 July 2018) , pp.86-90.

[73] SENER (2016a), p.15.

[74] There are also 208 firms holding permits to transport LPG by means other than pipelines (e.g. ships, train and tanker trucks).

[75] The list of permit holders is updated monthly. The most recent information is at www.gob.mx/cre/documentos/permisos-otorgados-en-materia-de-gas-lp.

[76] According to the Regulation on the Activities Referred to by the Third Title of the Hydrocarbons Law.

[77] SENER (2017a).

[78] A gigacalorie is defined as the volume of natural gas that contains an energy level equivalent to a billion calories at 98.065 kilopascal (i.e. 1 kg/cm^2 of absolute pressure) and at a temperature of 20ºC. See www.naturgy.com.mx/servlet/ficheros/1297100367019/881%5c970%5ccondicionesgeneralestolucaCREDEF,0.pdf (accessed on 24 July 2018).

[79] See CRE, "Permisos de Gas natural, Petróleo e Hidrocarburos", http://organodegobierno.cre.gob.mx/permisos.aspx, (accessed on 19 July 2018).

[80] The list of permit holders is updated monthly. The most recent information can be found at www.gob.mx/cre/documentos/permisos-otorgados-en-materia-de-gas-lp.

[81] Ibid.

[82] Ibid.

[83] EY (2016), *Navigating Mexico's Energy Reform: The LPG Market*, www.ey.com/Publication/vwLUAssets/ey-navigating-mexico-lgpmarket-2017/$FILE/ey-navigating-mexico-lgpmarket-2017.pdf (accessed on 24 July 2018).

[84] SENER (2017c) *Prospectiva de gas L.P. 2017-2031*, https://www.gob.mx/cms/uploads/attachment/file/325638/Prospectiva_de_Gas_LP_2017-2031.pdf (accessed on 24 July 2018).

[85] "Relación de permisos de importación de Gas LP vigentes al 16 de mayo de 2018", www.gob.mx/cms/uploads/attachment/file/333953/GAS_LP_Permisos_de_importaci_n_16_de_mayo_de__2018.pdf (accessed on 19 July 2018).

[86] Article 83 of the Hydrocarbons Law.

[87] SENER (2016c), *Prospectiva de gas L.P. 2016-2030*, www.gob.mx/cms/uploads/attachment/file/177623/Prospectiva_de_Gas_LP.pdf (accessed on 24 July 2018), p.15.

[88] See articles 41 and 42 of the Hydrocarbons Law. Retailers buy mostly from PEMEX, but can also buy from foreign companies that import gas into Mexico.

[89] CRE, "Expendio al público de gas licuado de petróleo mediante bodega de expendio", 3 August 2016, www.gob.mx/cre/acciones-y-programas/expendio-al-publico-de-gas-licuado-de-petroleo-mediante-bodega-de-expendio (accessed on 24 July 2018).

[90] Ibid.

[91] "Permisos vigentes de expendio al público de Gas Licuado de Petróleo mediante estación de servicio con fin específico. Corte al 16 de julio de 2018", www.gob.mx/tramites/ficha/permiso-de-expendio-al-publico-mediante-estacion-de-servicio-con-fin-especifico/CRE5215 (accessed on 27 July 2018).

[92] See CRE, "Expendio de gas licuado de petróleo mediante estación de servicio para autoconsumo", 3 August 2016, www.gob.mx/cre/acciones-y-programas/expendio-al-publico-de-gas-licuado-de-petroleo-mediante-estacion-de-servicio-para-autoconsumo (accessed on 24 July 2018).

[93] www.gob.mx/tramites/ficha/permiso-de-expendio-al-publico-mediante-estacion-de-servicio-con-fin-especifico/CRE5215 (accessed on 27 July 2018).

[94] Article 19 of the Regulation on the Activities Referred to by the Third Title of the Hydrocarbons Law.

[95] See CRE, "Implementación del Programa de Cesión de Contratos de Comercialización de Gas Natural", 23 January 2017, www.gob.mx/cre/articulos/cesion-contratos-gas-natural (accessed on 24 July 2018).

[96] Ibid.

[97] The procedure consisted of three phases: CRE first selected 30% of PEMEX volume not to be included in the PCC and divided the remaining 70% of the company's volume (i.e. contracts) into three separate lots of 20%, 20% and 30%. The initial 20% was offered through Phase I of the PCC, held between January and April 2017. The remaining 50% of contracts were offered in Phases II (20%) and III (30%), initially planned at the end of the year 2017 and the first half of the year 2018, respectively. The results of Phases II and III were not available at the time of this report's publication.

[98] See CRE, "La CRE concluye la Fase I del Programa de Cesión de Contratos de Gas Natural", 11 October 2017, www.gob.mx/cre/prensa/la-cre-concluye-la-fase-i-del-programa-de-cesion-de-contratos-de-gas-natural (accessed on 24 July 2018).

[99] See https://datos.gob.mx/busca/dataset/permisos-de-actividades-en-materia-de-gas-lp (accessed on 24 July 2018).

[100] SENER (2016c), p.15.

[101] IEA (2017), p.108.

[102] SENER (2016c), p.19.

[103] Acuerdo de la Comisión Reguladora de Energía que deja sin efectos la metodología para la determinación de los precios máximos de gas natural objeto de venta de primera mano, aprobada mediante la resolución RES/998/2015, y elimina el precio máximo de gas natural objeto de venta de primera mano para que se determine bajo condiciones de libre mercado, A/026/2017 (published in DOF on 16 June 2017), http://dof.gob.mx/nota_detalle.php?codigo=5487216&fecha=16/06/2017 (accessed on 24 July 2018) and CRE, "Se elimina el precio máximo de venta de primera mano de gas natural", 16 June 2016, www.gob.mx/cre/prensa/se-elimina-el-precio-maximo-de-venta-de-primera-mano-de-gas-natural (accessed on 24 July 2018).

[104] The most recent methodology was set out in "Resolución por la que la Comisión Reguladora de Energía expide la metodología para la determinación de los precios máximos de gas natural objeto de venta de primera mano", http://dof.gob.mx/nota_detalle.php?codigo=5425668&fecha=15/02/2016 (accessed on 24 July 2018).

[105] CRE, "Directiva sobre la determinación del precio límite superior del gas licuado de petróleo objeto de venta de primera mano", 4 January 2017, www.gob.mx/cre/articulos/precios-de-gas-lp (accessed on 24 July 2018).

[106] The maximum price for first-hand sales is determined by a methodology established in the Agreement A/060/2016 of 20 December 2017 in which CRE set conditions that PEMEX and its subsidiaries needed to follow. See, www.pemex.com/comercializacion/productos/Precios/Precios/CIRCULAR%20PVPM%20GLP%20ENERO%202017.xls (accessed on 24 July 2018).

[107] See US Energy Information Administration, "Mont Belvieu, TX Propane Spot Price FOB", www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=eer_epllpa_pf4_y44mb_dpg&f=w (accessed on 24 July 2018). This price only refers to propane; LPG is a mixture of propane and butane.

[108] See the series: "Energía > Comercio exterior de energía primaria y secundaria > Exportación Gas licuado", "Energía > Comercio exterior de energía primaria y secundaria > Importación Gas licuado", "Energía > Comercio exterior de energía primaria y secundaria > Exportación Gas natural" and "Energía > Comercio exterior de energía primaria y secundaria > Importación Gas natural", www.inegi.org.mx/sistemas/bie/ (accessed on 24 July 2018).

[109] See FTI Consulting, "Prospectiva de gas natural en México: el sector eléctrico impulsará el mercado", www.fticonsulting.com/~/media/Files/us-files/insights/white-papers/natural-gas-mexico-energy-spanish.pdf (accessed on 24 July 2018).

[110] At first sight, there is a significant gap between the share of imports from the US by volume and imports by value. This difference might be partly explained by the current (September 2018) low price for gas in the US. The United States is among the OECD countries with the lowest prices for natural gas.

[111] SIAVI tariff codes 2711.11.01 and 2711.21.01, see www.economia-snci.gob.mx.

[112] British Petroleum (2018), *BP Statistical Review of World Energy June 2018*, www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf (accessed on 19 July 2018).

[113] Article 6 of the Hydrocarbons Law.

[114] Articles 12 and 14 of the Hydrocarbons Law.

[115] Articles 6 and 80 of the Hydrocarbons Law.

[116] SENER grants import permits for tariff item 2711.19.01 (butane and propane, mixed and liquefied) and it also grants export permits for tariff items 2711.11.01 (natural gas in its liquefied state) and 2711.21.01 (natural gas in its gaseous state)

[117] Article 33, letters I, VII and VIII of the Organic Law of the Federal Public Administration (Ley Orgánica de la Administración Pública) and Article 48, letter I of the Hydrocarbons Law.

[118] CENACE is a de-centralised entity in charge of the operational control of the National Electrical System and the operation of the wholesale electricity market. It also guarantees impartiality of access to the National Transmission Network and to the General Distribution Networks. SENER, "Se instaló en la SENER el Consejo de Coordinación del Sector Energético", 5 September 2016, www.gob.mx/sener/prensa/se-instalo-en-la-sener-el-consejo-de-coordinacion-del-sector-energetico?idiom=es-MX (accessed on 24 July 2018).

[119] Article 43 of the Hydrocarbons Law and Article 38 of the Decreto por el que se expide la Ley de los Órganos Reguladores Coordinados en Materia Energética; se reforman, adicionan y derogan diversas disposiciones de la Ley Orgánica de la Administración Pública Federal y, se expide la Ley de la Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos (published in DOF on 11 August 2014).

[120] See, Decreto por el que se expide la Ley de los Órganos Reguladores Coordinados en Materia Energética.

[121] CNH, "Presupuesto de la Comisión Nacional de Hidrocarburos", 23 October 2017, www.gob.mx/cnh/documentos/presupuesto-cnh (accessed on 24 July 2018).

[122] OECD (2017a), *Driving Performance at Mexico's National Hydrocarbons Commission*, The Governance of Regulators, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264280748-en.

[123] OECD (2017b), *Driving Performance of Mexico's Energy Regulators*, The Governance of Regulators, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264267848-en, p.18.

[124] According to Article 60 of the Hydrocarbons Law, integrated systems can be any interconnected systems for the storage and transportation through pipelines of natural gas, oil products and petrochemicals whose objective is to expand coverage or improve conditions related to the security, continuity, quality, efficiency of services.

[125] Article 48, letter II of the Hydrocarbons Law.

[126] Article 81, letters I-f and III of the Hydrocarbons Law.

[127] Article 78 of the Hydrocarbons Law.

[128] SENER (2017d), *La evolución constitucional de la energía a partir de 1917*, www.inehrm.gob.mx/recursos/Libros/SENERGIA.pdf (accessed on 24 July 2018) pp.154-155.

[129] See www.gob.mx/cnh/documentos/cumplimiento-de-obligaciones-de-transparencia.

[130] Sigler, E., "Cenagas pagará a Pemex 3,000 mdp por sus servicios en 2016", *Expansión*, 11 August 2016, https://expansion.mx/empresas/2016/08/10/cenagas-pagara-a-pemex-3-000-mdp-por-sus-servicios-en-2016 (accessed on 24 July 2018).

[131] Article 33, letter VIII of the Organic Law of the Federal Public Administration (Ley Orgánica de la Administración Pública Federal), most recent reform published in DOF on 19 May 2017.

[132] See CENAGAS, "Informe de Autoevaluación correspondiente al primer semestre de 2017", http://transparencia.cenagas.gob.mx/res/transparencia/informes/Informe%20de%20Autoevaluaci%

C3%B3n%20Correspondiente%20al%20Primer%20Semestre%202017%20y%20Alcance.pdf (accessed on 24 July 2018).

[133] OECD (2017c), *Driving Performance at Mexico's Agency for Safety, Energy and Environment*, The Governance of Regulators, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264280458-en.

[134] See https://cnh.gob.mx/Informacion/odac/ODAC-Triptico_vf12022018.pdf (accessed on 24 July 2018).

[135] Instituto Mexicano del Petróleo (2017), *Informe de Autoevaluación institucional. Primer semestre 2017*, https://sps.imp.mx/imp/OTIMP/Documentos%20compartidos/Transparencia/UT/2017/Informe%20Auto%20Inst%201S%202017.pdf (accessed on 24 July 2018).

[136] OECD (2017c), p.78.

[137] See www.amexhi.org/quienes-somos (accessed on 24 July 2018).

[138] See www.amgn.org.mx/nosotros.html (accessed on 24 July 2018).

[139] Mexico Business Publications, *Mexico Oil & Gas Review 2016*, Mexico Business Publications, Mexico City, http://mexicooilandgasreview.com/2016/index.html (accessed on 24 July 2018), p.280.

[140] http://adigas.mx (accessed on 24 July 2018).

[141] Tordo, S., M. Warner, Y. Anouti (2013), *Local Content Policies in the Oil and Gas Sector*, World Bank Study, World Bank, Washington DC, http://documents.worldbank.org/curated/en/549241468326687019/pdf/789940REVISED000Box377371B00PUBLIC0.pdf.

[142] COFECE (2018), *Transición hacia Mercados Competidos de Energía: Gas LP* (*The Transition to Competitive Energy Markets: LPG*), www.cofece.mx/wp-content/uploads/2018/06/Libro-GasLP_web.pdf#pdf, p.55.

[143] COFECE (2015), *Guía 007/2015: Guía para el Intercambio de Información entre Agentes Económicos* (Guide for Information Exchanges Between Economic Agents), www.cofece.mx/wp-content/uploads/2018/01/guia-0072015_intercambioinf.pdf.

[144] OECD (2017), *Driving Performance of Mexico's Energy Regulators*, The Governance of Regulators, OECD Publishing, Paris, https://doi.org/10.1787/9789264267848-en, p.23.

[145] OECD (2014), *Regulatory Enforcement and Inspections*, OECD Best Practice Principles for Regulatory Policy, OECD Publishing, Paris, https://doi.org/10.1787/9789264208117-en.

[146] OECD (2017), p.24.

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Annex 2.A. Quantification of recommendations

If all OECD recommendations are fully implemented, the annual benefit to consumers is estimated between MXN 2 182.8 million and MXN 3 740.3. A summary of the estimated benefits to consumers is shown in the table below.

Annex Table 2.A.1. Estimates of total consumer benefits

Recommendation	Consumer benefit (MXN, millions)	
	Lower end	Upper end
1. Midstream: increase the number of final consumers being able to switch from LPG to natural gas	1 395.7	2 670
2. Downstream: promote the retail of LPG cylinders by supermarkets and gas stations	787.1	1 070.3
Total	2 182.8	3 740.3

OECD competition assessments calculate the consumer benefit from downstream and midstream recommendations, as these are the activities that will have a direct impact on final consumers.

With regard to recommendations for the upstream level, the OECD makes several recommendations that would make production easier and lead to more gas being produced in Mexico rather than imported from abroad. Wholesale gas prices are highly dependent on international markets and as such an increase in domestic production would help the Mexican industry. It would not, however, necessarily translate to lower prices to consumers, so it is not included in the quantification of consumer benefits. Nevertheless, an increase of 1% in Mexican natural-gas production could lead to an increase of home produced (rather than imported) gas worth MXN 646.8 to 1 258.4 million a year.

2.A.1. Midstream: facilitating the construction of natural-gas pipelines by simplifying the regulatory environment

If this OECD recommendation is fully implemented and the number of natural-gas pipelines increases, the benefit to consumers due to lower natural-gas prices is estimated to be between MXN 1 395.7 million and MXN 2 670 million.

Description of obstacle and harm to competition. Currently, only 8% of Mexican households use natural gas as their main fuel source. This is because most Mexican households, as well as the communities they live in, are not connected to natural-gas pipelines and thus have to rely on LPG, which tends to be more expensive. There are several reasons for the low adoption of natural-gas distribution in Mexico, all in some way related to the difficulty of building new infrastructure. The obstacles found include:

- Difficulty in obtaining municipal permits for building pipelines.
- Misalignment of interests between municipal authorities and companies.

- A significant part of Mexico's land being classified as forestry lands, so natural-gas companies have to change the land-use registration of the land on which they plan a pipeline.
- Difficulties in negotiating with landowners for compensation owed by gas companies.
- Compensation agreements between gas companies and landowners need validation by local judges.
- The necessity of double notification of negotiations between landowners over whose property the pipelines will be constructed and natural-gas pipeline companies with both the Ministry of Energy (*Secretaría de Energía, SENER*) and the Ministry of Agrarian, Territorial and Urban Development (*Secretaría de Desarrollo Agrario, Territorial y Urbano, SEDATU*).

Recommendation

The OECD recommends a number of measures to ease the construction of natural-gas pipelines. If implemented, those measures would increase the number of consumers with a choice between LPG and natural gas.

Potential savings of MXN 1 395.7 million to MXN 2 670 million would have a significant effect on Mexican households. According to INEGI (2016), electricity and LPG accounted for 5% of total expenditures of the 10% poorest households. As such, any saving in these areas can have a significant impact upon household finances. Furthermore, these estimates are significant when compared to the size of the LPG retail market: its volume in areas with more than 100 000 people is MXN 52 618 million (INEGI, 2016). As such, these estimates imply savings of between 2.5 and 5% of the total LPG retail market share in cities. If the total annual retail market of LPG, which amounts to MXN 94 056.1 million (INEGI, 2016), is considered, both in small and large towns, the OECD estimates that this restriction implies 1.4% to 2.8% savings.

Methodology

Of the 24.88 million households that use LPG, 15% store the gas in stationary tanks,[1] while the remaining 85% uses gas cylinders. For this recommendation, it is assumed that consumers with stationary tanks are more likely to switch to natural gas than those using cylinders. This assumption has two underlying reasons. First, households that use tanker trucks generally have a higher income than those using cylinders. As such, these households are more likely to be able to pay the fees for the conversion process from LPG to natural gas. These fees amount to approximately MXN 2 500 for the connection.[2] Second, natural-gas pipelines are more likely to be built in areas with a population larger than 100 000 as there are more potential clients and companies benefit from economies of scale. Indeed, a critical mass of customers must be reached in order for a natural-gas distributor to be profitable. As such, using data from INEGI's National Survey of Household Income and Expenditure 2016, the OECD assumed that in 2016, 2.38 million households were using stationary LPG tanks and living in populations of over 100 000 people.

Both a lower and an upper bound for the consumer benefits resulting from implementing the recommendation to increase the number of distributors of LPG were calculated.

Lower bound

To estimate a lower bound of the consumer benefit resulting from implementing the recommendation, it is assumed that 50% of current households using LPG stationary tanks in cities switch to natural gas, which would be 1.19 million households. Using data from INEGI's 2016 National Survey of Household Income and Expenditure, it was calculated that the average monthly household expenditure for filling their stationary tanks amounted to MXN 495 a month or MXN 5 496 per year. As stated above, INEGI elaborates consumer price indexes (CPI) for different products, including LPG. Between January 2016 and June 2018, the LPG CPI increased by 32% (INEGI, 2018). As such, adjusting for this increase in the LPG CPI, the annual average expense of LPG stationary tanks by a household would amount to MXN 7 848 in June 2018. According to interviews with industry participants, natural gas is between 10 and 20% cheaper than LPG considering calorific power. For the purpose of this study, the potential savings of switching were set at 15%. Furthermore, the conversion fees was set at zero. This was because stationary tanks need replacing every ten years and even the cheapest cost more than the current connection fee.[3]

The lower bound of the consumer benefit, CB_{low}, resulting from implementing the recommendation is given by the following formula:

$$CB_{low} = (H_{tank} \times \alpha) \times (\rho \times \bar{E}_{tank})$$

Where:

- CB_{low} is the standard measure of consumer benefit;
- H_{tank} is the number of households currently using LPG stationary tanks and in population centres of more than 100 000 inhabitants (equal to 2.38 million households);
- α is the percentage of households living in population centres of more than 100 000 inhabitants currently using LPG in stationary tanks and switching to natural gas; this percentage is assumed to be 50%.
- $\bar{E}_{tank}$ is the average annual expenditure in LPG for stationary tanks of a household; this amounts to MXN 7 848;
- ρ is the price percentage decrease resulting from switching from LPG to natural gas, for a given heating capacity; this is taken to be 15%.

This gives:

$$CB_{low} = (2.38 \text{ million households} \times 0.5) \times (0.15 \times \text{MXN } 7\,840) =$$
$$\text{MXN } 1\,395.7 \text{ million}$$

Upper bound

For the upper-bound scenario, it is still assumed that 50% of households with LPG stationary tanks and living in population centres of more than 100 000 inhabitants switch to natural gas. Additionally, it is assumed that 25% of LPG cylinder users in population centres over 100 000 inhabitants also switch to natural gas. A fifth of households using LPG cylinders in populations centres over 100 000 inhabitants equals 2.75 million households. INEGI's National Survey of Household Income and Expenditure from 2016 allows the calculation that the average cylinder-using household pays MXN 195 a month or MXN 2 341 a year or rising to MXN 3 090 by June 2018 using an inflation adjustment similar to that mentioned before using data from 2018 INEGI CPI.

The upper bound of the consumer benefit, CB_{high}, resulting from the implementation of the recommendation is shown in the following formula:

$$CB_{high} = CB_{low} + \left(H_{cylinders} \times \beta\right) \times \left(\rho \times \bar{E}_{cylinders}\right)$$

Where:

- CB_{low} is the lower bound of the consumer benefit;
- β is the percentage of households living in population centres over 100 000 inhabitants, currently using LPG cylinders, and assumed to switch to natural gas; this is taken to be 25%;
- $H_{cylinders}$ is the number of households currently using LPG cylinders and in population centres with fewer than 100 000 inhabitants; this amounts to 10.99 million households;
- $\bar{E}_{cylinders}$ is the average annual household expenditure on LPG cylinders; this is MXN 3 090;
- ρ is the price percentage decrease resulting from switching from LPG to natural gas for a given heating capacity; this is taken to be 15%.

This gives:

$$CB_{high} = \text{MXN 1 395.7 million} + (10.99 \text{ million households} \times 0.25) \times (0.15 \times \text{MXN 3 090}) = \text{MXN 2 670 million}$$

2.A.2. Downstream: increasing the number of LPG-cylinder distributors

If the OECD recommendation to increase the number of LPG distributors, especially supermarkets and gas stations, is fully implemented, and all supermarkets and large service stations are able to sell portable cylinders, the benefit to consumers is estimated to be between MXN 787.1 million and MXN 1 338.8 million.

Caveat

These numbers might appear small for such an important market. This is because, although LPG is used by 76% of households, it is mainly used for cooking and heating water. In many countries, LPG is also used for heating, which increases expenditure. Yet even if the amounts might appear small, they are important for the concerned households. According to INEGI (2016), electricity and LPG accounted for 5% of total expenditures of the 10% poorest households. As such, any saving in these areas can have an important effect on people's finances. Furthermore, the estimates appear more significant when compared to the size of the LPG retail market. The volume of the total retail market for LPG gas in areas with more than 100 000 people is MXN 52 618 million (INEGI, 2016). As such, the estimates imply savings of between 2.5 and 5% of the total LPG retail market share in cities. If the total retail annual market of LPG is considered, both in small and large towns, this amounts to MXN 94 056.1 million (INEGI, 2016), which the OECD estimates imply savings of 1.4% to 2.8%.

Description of obstacle and harm to competition

Retailers often have difficulties selling LPG cylinders due to complications in obtaining municipal permits. Currently, LPG cylinders in Mexico are mainly sold by distributors.

Very few retailers, such as supermarkets or service stations, are active in the market selling LPG cylinders to end consumers from their premises. Municipal permits are often difficult to obtain as requirements can vary across municipal authorities and must be obtained on an establishment-by-establishment basis (i.e. individually for each store or service station). The lack of clear criteria for the granting of municipal permits appears to make the sale of portable cylinders at retail stores and service stations more difficult. Not having additional suppliers, especially retail stores and service stations, deprives consumers of greater diversity and lower prices.

Recommendation

The OECD recommends establishing a department within one federal agency to facilitate business for LPG companies at a municipal level. For retail storage facilities selling LPG cylinders (*bodegas de expendio*), the department could also offer model permit applications to municipalities.

Methodology

In June 2018, COFECE, the Mexican competition authority, published the report *Transición hacia Mercados Competidos de Energía: Gas LP* that advises on how to make the LPG market more competitive. The study includes aggregated information on the actual number of LPG distributors in each area and gives an estimate on price reductions following increases in their number.

COFECE uses 145 distribution areas, as defined by CRE in January 2008. These areas comprise at least one full municipality in one or more Mexican states. In general, metropolitan areas are bundled together, as are small towns. For the purpose of this quantification it is assumed that each of the 145 areas as defined by CRE has the same population.

COFECE's report only provides information (COFECE, 2018, p.68) on the number of distributors in each area in an aggregate form. It shows the dispersion of distributors in each area as a box plot (a method for graphically depicting groups of numerical data through their quartiles, showing 25% quartile, median and 75% quartile) divided by the area's population size (one box plot for areas under 100 000 people, one for areas with population between 100 000 and 500 000, one for areas with population between 500 000 and 1 million, and one for areas with population over 1 million). As such, it is not possible to determine the exact number of distributors in each CRE area. In the case of CRE areas with towns with a population of fewer than 100 000 people, however, the graph clearly states that 25% of those areas have one or zero distributors, another 25% have either one or two distributors, an additional 25% have either two or three distributors and the remaining 25% have three or more distributors. As such, for the purpose of this analysis the areas above the 75% quartile will not be used because it is not possible to determine the number of distributors. Furthermore, it is also impossible to determine the number of distributors in CRE areas of more than 100 000 inhabitants due to the way the information is displayed in the box plot.

The report uses regression analysis to establish the marginal effect on prices of one more competitor joining an area that currently has k number of distributors.

The results were as follows:

Annex Table 2.A.2. Average percentage price reduction of regions where k distributors are present

Change in distributors (k to k+1)	Percentage price reduction (*?k)*
1 to 2	6.56%
2 to 3	2.24%
3 to 4	1.12%
4 to 5	0.68%

Source: COFECE (2018), *Transición hacia Mercados Competidos de Energía: Gas LP*, p.61.

Every two years, most recently in 2016, the Mexican National Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía, INEGI) carries out a National Survey of Household Income and Expenditure (Encuesta Nacional de Ingresos y Gastos de los Hogares, ENIGH), at a national, state and large-city level. This survey outlines the type of fuel households use as well as their average monthly expenses. According to the 2016 survey, average annual household spending on LPG cylinders amounts to MXN 2 341. In addition, INEGI elaborates monthly consumer price indexes (CPI) for different products including LPG. From 2016 until June 2018, the LPG CPI has increased by 32% (INEGI, 2018). As such, adjusting for this CPI increase, the annual average expense of LPG cylinders by household was MXN 3 090 in June 2018.

In the following section, a lower and an upper bound for the consumer benefits resulting from implementing the recommendation to increase the number of distributors of LPG are calculated.

Lower bound for consumer benefits

The lower bound for consumer benefits is the savings in total expenditure on LPG cylinders for households in population centres with fewer than 100 000 inhabitants. This lower bound, CB_{low}, is given by:

$$CB_{low} = \frac{H_{small}}{4} \times \bar{E}_{small} \times (\rho_1 + \rho_2 + \rho_3)$$

Where:

- CB_{low} is the standard measure of consumer benefit;
- H_{small} is the number of households that live in areas with fewer than 100 000 inhabitants;
- $\bar{E}_{small}$ is the average annual expenditure in gas cylinders of a household;
- ρ_k is the average percentage change in price related to introducing one more distributor in an area given k current distributors.

As such the annual consumer benefit equals three quarters the number of households in towns with populations under 100 000 that use cylinders, times the average annual household expenditure on cylinders. Only three quarters of the population is used as the effect in the last quartile cannot be determined. This is then multiplied by the marginal effect of introducing a new competitor in an area that currently has k distributors. The new formula is:

$$CB_{low} = \frac{10.3\ million\ households}{4} \times 3\,090\ MXN \times (6.56 + 2.24 + 1.12)$$

This yields a consumer benefit of MXN 787.1 million.

Upper bound for consumer benefits

The upper bound for consumer benefits assumes that implementing the recommendation results in an addition reduction in households' LPG-cylinder expenses for households in population centres with more than 100 000 inhabitants. It is assumed that the expenses of this type of household will fall equal to half the average of the percentual price reductions (i.e. the ρ's) contained in Table 2. The upper bound for consumer benefits, CB_{high}, is therefore expressed in the following formula:

$$CB_{high} = CB_{low} + \tilde{\rho} \times H_{big} \times \bar{E}_{big}$$

For which:

- CB_{high} is the upper bound for consumer benefit;
- CB_{low} is the lower bound for consumer benefit;
- $\tilde{\rho}$ is the average percentage change in price related to introducing one more distributor in population centres of more than 100 000 inhabitants, a variable taken to be that of the change from 4 to 5 distributors, that is, $\tilde{\rho}$ is equal to 0.68%;
- H_{big} is the number of households in population centres of more than 100 000 inhabitants;
- $\bar{E}_c$ is the average annual household expenditure on gas cylinders.

According to INEGI's ENIGH, as of 2016, there existed 13.47 million households living in cities of more than 100 000 inhabitants (INEGI, 2016). As mentioned above, these households spent, on average, MXN 3 090 a year in June 2018 prices. Therefore:

$$\begin{aligned} CB_{high} &= \text{MXN 787.1 million} + 0.0068 \times 13.47 \text{ million households} \times \text{MXN 3 090} \\ &= \text{MXN 1 070.3 million} \end{aligned}$$

2.A.3 Upstream: resolving problems in tendering and production of natural gas

As mentioned above, the OECD's recommendations for the upstream sector have no direct impact on consumer benefits, but would have an effect on Mexican natural-gas production. This, however, does not necessarily mean lower domestic prices, since the price of natural gas in Mexico depends more on international prices. As such, if the OECD recommendations related to increasing natural-gas production are fully implemented, the benefit would be in terms of domestic natural-gas production, rather than consumers.

The OECD considers that if the market participants were able to increase their production of natural gas by 1%, this extra production would be worth between MXN 646.8 million and MXN 1 258.4 million.

Harm to competition

Since its energy reform of 2013, the Mexican government has held two main rounds of tenders during which areas containing gas were allocated to private companies for production. However, not all areas were successfully tendered and industry participants have complained that certain conditions after tendering might reduce production or delay it. The following restrictions were identified.

- **Requirements for private companies to hold tender procedures.** The provision might increase costs for private companies forced to run tender procedures even for

comparatively small amounts (restricted invitation procedure from USD 5 million up; full tender from USD 20 million up).

- **Excessive preconditions for participating in exploration-rights tenders.** For example, companies wanting to participate need to pre-qualify for each tender even if they have participated the same year in tenders with the same or even stricter requirements.
- **Requirements for companies to use a minimum percentage of national content.** This includes Mexican goods, services, qualified Mexican labour, and training of Mexican labour and was set at 25% in 2015, increasing gradually to at least 35% by 2025. In practice, it is difficult to check whether a company complies with regulations on minimum national content since all the suppliers used by exploration and extraction companies (who have their own sub-contractors and, in turn, their sub-contractors) have to be taken into account. Market participants claim to be uncertain of which accountability methodologies to use in order to estimate whether they are compliant.
- **Lack of resources within the Mexican Ministry of Energy (SENER)**. The SENER General Directorate of Social Impact and Surface Occupation delays the tendering of areas, as well as production of areas already contracted.

Recommendation

The OECD recommends a number of measures to facilitate participation in tenders and increase production. If implemented, those measures would lead to private companies increasing their production and sales.

Methodology

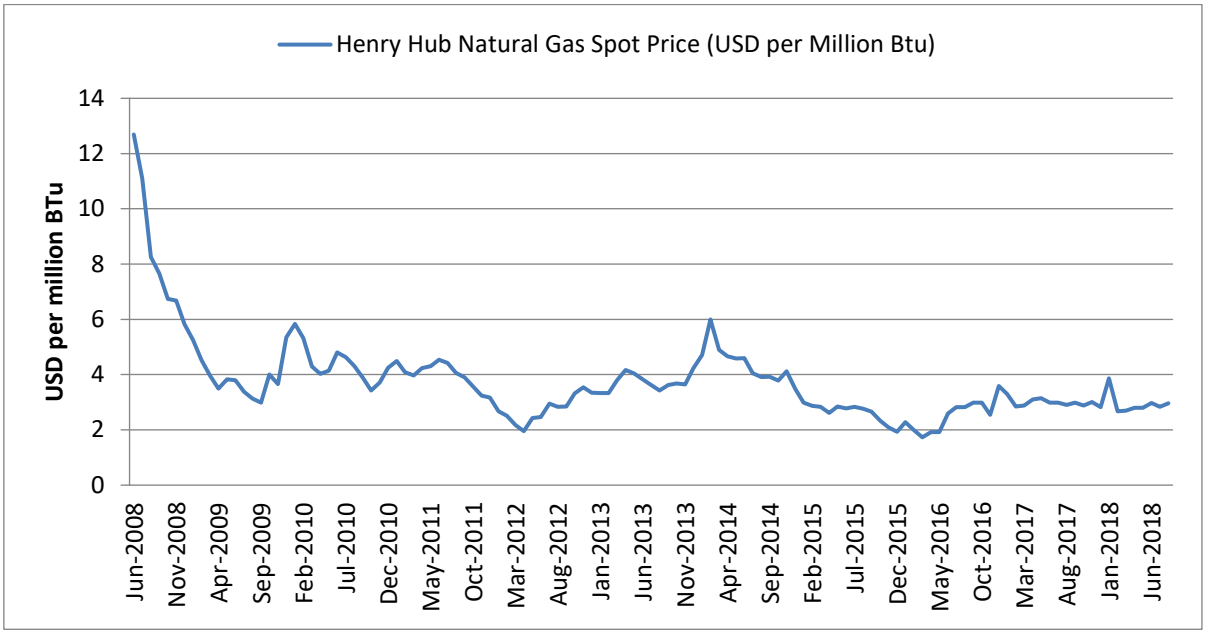
If the OECD recommendations were implemented, production at the upstream level of natural gas could be increased by 1% from 2017 levels.

This was calculated using two possible scenarios. In the first, it was assumed that the increase in prices follows international levels. As such, average US wellhead prices were used; these are the prices at which natural gas is sold before transportation and processing and are published by the US Energy Information Agency (EIA). For an upper bound Mexican first-hand sale VPM prices were used, and, after their liberalisation in mid-2017, wholesale natural-gas prices (which are essentially VPM prices); these are published by CRE.

Caveat

Currently, prices for natural gas at the upstream level are at historical lows. As can be seen in Figure 1 the current Henry Hub price for natural gas is about 22% of what it was a decade ago (IEA, 2018). In June 2008, the price for 1 million British thermal units (Btu) was USD 12.69 USD; by June 2018, the price was only USD 2.97.

Annex Figure 2.A.1. Henry Hub Natural Gas Spot Price (USD per million Btu)



Source: EIA, 2018.

Furthermore, low prices and other issues have seen Mexican production of wet natural gas also decline. In 2013, production was 65 840.8 million cubic meters; by 2017, it had dropped to 52 381.3 million cubic feet. Lower prices for gas in Mexico generally also lead to lower national production as only the cheapest gas to produce will be extracted; other gas will be left in the ground as it would not be profitable to produce it. This is also because Mexican gas production is expensive in comparison to US gas production, mostly due to long-term underinvestment in the national industry. Mexico is a "price taker", not a "price maker". (S&P Global Platts, 2018). This combination of low prices of gas at upstream level and low production results in a base line for quantification at the upstream level being extremely low.

Lower bound for savings

To calculate the lower bound, average US wellhead prices for 2017 and Mexican production rates (from INEGI figures) were used.

A 1% increase in production was estimated, while prices were kept constant. As mentioned above, prices in Mexico are reactive to the volume of national production only to an extremely small degree. It is assumed that when restrictions are lifted, production becomes cheaper and so more competitive meaning more gas is extracted in Mexico at that current or higher international natural-gas price. This lower bound, S_{low}, is shown as:

$$S_{low} = \beta \times P_{w2017} \times production_{2017}$$

Where:

- S_{low} is the standard measure of savings for Mexico as it imports less natural gas;
- β is the marginal effect of lifting these restrictions, in this case, 1%;
- P_{w2017} is the average US 2017 wellhead price for natural gas per mcf in MXN;
- $production_{2017}$ is the total production of natural gas in Mexico in 2017 in mcf.

This produces:

$$S_{low} = 1\% \times 34.9 \times 1000 \times$$

$$S_{low} = 646.8\, million$$

Upper bound for savings

To calculate the upper bound, the monthly average prices for VPM in 2017 and Mexican production were used. Currently, Mexican prices are much higher than American prices due to various production issues. VPM prices are the prices at which PEMEX PEP sells gas to its processing subsidiary (PEMEX PEP is currently the only producer of natural gas, although some production wells have been allocated to private companies in the first two tender rounds). In general, this price will reflect its production cost, which is higher than the international wholesale price. As such, currently PEMEX PEP only sells to itself. PEMEX TRI (PEMEX PEP's subsidiary) continues to buy gas from PEMEX PEP, even if it is more expensive than imported gas, because it has the infrastructure to process it, but the purchase volumes have steadily decreased as the opportunity price of importing gas has increased. As such, if PEMEX PEP lowers its production costs it could sell gas at a more competitive price to PEMEX TRI, and at a later date, to other processing companies. This is why an estimate of a 1% increase in production is used, while keeping prices constant. This higher bound, S_{high}, is stated as:

$$S_{high} = \beta \times \sum_{1}^{12} P_{VPMt} \times production_t$$

Where:

- S_{high} is the standard measure of savings in millions MXN;
- β is the marginal effect of lifting these restrictions, in this case 1%;
- P_{VPMt} is the VPM price for natural gas;
- t is every month from January-December 2017;
- $production_t$ is the total production of natural gas in Mexico in mcf.

Annex Table 2.A.3. VPM prices and production by month in 2017

	Price per mcf (MXN)	Monthly production mcf	Production (millions MXN)
Jan 17	60 602.22405	165 106	10 005.7908
Feb 17	76 966.09061	148 372	11 419.6128
Mar 17	66 457.76624	166 873	11 090.00683
Apr 17	49 882.88916	160 020	7 982.259923
May 17	56 455.86715	164 269	9 273.94884
Jun 17	56 498.06925	157 590	8 903.530734
Jul 17	73 271.82376	161 696	11 847.76082
Aug 17	76 824.29153	156 085	11 991.11954
Sep 17	72 821.21078	129 060	93 98.305463
Oct 17	74 293.53675	147 529	10 960.45118
Nov 17	79 462.23967	144 090	11 449.71411
Dec 17	77 258.4457	149 141	11 522.40185

Substituting this in the original equation gives:

$$S_{high} = 1\% \times 125\,844.9$$

$$S_{high} = 1\,258.4 \text{ million}$$

Notes

[1] A stationary tank is a refillable metal storage container for LPG within residential premises. They are refilled from tanker trucks, that is a motor vehicle carrying one or more non-demountable containers filled with LPG.

[2] Naturgy, currently the largest natural-gas distributor in Mexico, charges a onetime fee of MXN 2 540 for each connection. For more information, see: www.naturgy.com.mx/servlet/ficheros/1297159717058/Tarifas2018_cdmxx.pdf.

[3] A brief survey of a major national retailer showed that the smallest stationary tank costs MXN 4 300, which is MXN 1 800 more than the Naturgy's connection fee. See: www.homedepot.com.mx/plomeria/tuberias-y-conexiones/tanques-reguladores-y-controladores-para-gas/tanque-est-100h-valvinds-l-200012.

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Annex A. Methodology

This study covers the gas sector, especially natural gas and its extraction, processing, transportation, distribution to final consumers, and the manufacturing of basic petrochemical products from natural gas, as well as liquefied petroleum gas and its extraction, processing, storage, transportation and distribution to final consumers. The sectors were selected in consultation with the Mexican Ministry of Economy.

The assessment of laws and regulations in these sectors and its subsectors has been carried out in four stages. The present annex describes the methodology followed in each of these stages.

Stage 1: Mapping the sectors

The objective of Stage 1 of the project was to identify and collect all sector-relevant laws and regulations for which it was necessary to define in detail the scope of the sector and its subsectors.

The task of collecting the relevant legislation for each of the sectors was conducted by the OECD team using a variety of sources. The main tools used to identify the applicable legislation were the online databases of the Mexican Chamber of Deputies,[1] the Mexican official gazette (Diario Oficial de la Federación),[2] and the website of the Mexican Supreme Court.[3] This was complemented by the websites of the relevant authorities and of industry and consumer associations. In addition, in order to ensure that all important pieces of legislation were covered by the study, input was solicited from the competent authorities and stakeholders involved in the selected sectors. In total, for Stage 1, 279 different pieces of legislation were identified.

Stage 2: Screening of the legislation and selection of provisions for further analysis

The second stage of the project mainly entailed the screening of the legislation to identify potentially restrictive provisions, as well as providing an economic overview of the relevant sectors. Every piece of legislation was scanned by two team members ("four-eyes principle").

The legislation collected in Stage 1 was analysed using the framework provided by the OECD *Competition Assessment Toolkit*. This toolkit, developed by the Competition Division at the OECD, provides a general methodology for identifying unnecessary obstacles in laws and regulations and developing alternative, less restrictive policies that still achieve government objectives. One of the main elements of the toolkit is a competition-assessment checklist that asks a series of simple questions to screen laws and regulations with the potential to restrain competition unnecessarily.

Box A1. OECD competition assessment checklist

Further competition assessment should be conducted if a piece of legislation answers "yes" to any of the following questions:

A) Limits the number or range of suppliers

This is likely to be the case if the piece of legislation:

1. Grants a supplier exclusive rights to provide goods or services.

2. Establishes a licence, permit or authorisation process as a requirement of operation.

3. Limits the ability of some types of suppliers to provide a good or service.

4. Significantly raises the cost of entry or exit by a supplier.

5. Creates a geographical barrier to the ability of companies to supply goods, services or labour, or invest capital.

B) Limits the ability of suppliers to compete

This is likely to be the case if the piece of legislation:

1. Limits sellers' ability to set the prices of goods or services.

2. Limits the freedom of suppliers to advertise or market their goods or services.

3. Sets standards for product quality that provide an advantage to some suppliers over others or that are above the level that some well-informed customers would choose.

4. Significantly raises the costs of production for some suppliers relative to others (especially by treating incumbents differently from new entrants).

C) Reduces the incentive of suppliers to compete

This may be the case if the piece of legislation:

1. Creates a self-regulatory or co-regulatory regime.

2. Requires or encourages information on supplier outputs, prices, sales or costs to be published.

3. Exempts the activity of a particular industry or group of suppliers from the operation of general competition law.

D) Limits the choices and information available to customers

This may be the case if the piece of legislation:

1. Limits the ability of consumers to decide from whom they purchase.

2. Reduces the mobility of customers between suppliers of goods or services by increasing the explicit or implicit costs of changing suppliers.

3. Fundamentally changes the information required by buyers to shop effectively.

Source: OECD (2017a)

Following the toolkit's methodology, the OECD team compiled a list of all the provisions that answered any of the questions in the checklist positively. The final list consisted of 105 provisions across the gas sector.

The OECD also prepared an extensive economic overview of the natural-gas and liquid-petroleum gas sectors, covering industry trends and main indicators, such as output, employment and prices, including comparisons with other OECD member countries where relevant. It also analysed summary statistics on the main indicators of the state of competition typically used by competition authorities, especially information on the market shares of the largest players in each sector. Where possible, these statistics were broken down by sub-sector. The analysis conducted during this stage aimed to furnish background information to better understand the mechanisms of the sector, providing an overall assessment of competition, as well as explaining the important players and authorities.

Stage 3: In-depth assessment of the harm to competition

The provisions carried forward to Stage 3 were investigated in order to assess whether they could result in harm to competition. In parallel, the team researched the policy objectives of the selected provisions, so as to better understand the regulation. An additional purpose in identifying the objectives was to prepare, in Stage 4, alternatives to existing regulations, taking account of the objective of the specific provisions when required. The objective of policymakers was researched in the recitals of the legislation, when applicable, or through discussions with the relevant public authorities.

The in-depth analysis of harm to competition was carried out qualitatively and involved a variety of tools, including economic analysis and research into the regulations applied in other OECD countries. All provisions were analysed, relying on guidance provided by the OECD's *Competition Assessment Toolkit*. Interviews with government experts at all relevant Mexican authorities active in the gas sector complemented the analysis by providing crucial information on lawmakers' objectives and the real-life implementation process and effects of the provisions.

An extremely important task begun during Stage 3 was the establishment of contact with the market through the main industry associations and private stakeholders active in the sectors. Interviews with market participants contributed to a better understanding of how the sub-sectors under investigation work in practice and helped in the discussion of potential barriers deriving from the legislation.

Stage 4: Formulation of recommendations

Building on the results of Stage 3, the OECD team developed preliminary recommendations for those provisions that were found to restrict competition. It tried to find alternatives that were less restrictive for suppliers, while still aiming to fulfil the policymakers' initial objective. For this process, the team relied on international experience whenever available.

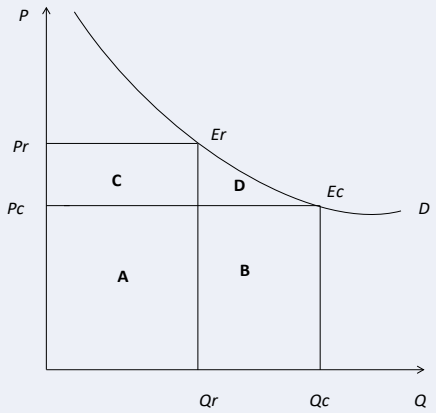
Additionally, whenever feasible and appropriate for the analysis of the benefits of removing barriers to competition, the OECD team gathered data that could be used for the quantification of the effects. In these cases, the data were analysed using econometric techniques. In other cases, the expected impact of a regulatory restriction could not generally be modelled directly because of the lack of sufficient data. Therefore, the standard methodology of measuring the effect of policy changes on consumer surplus was

used. In particular, the team followed the approach in OECD (2017c) that derives a formula for changes in consumer benefit when only sector revenue and the average price effect of the found restriction are available. This is explained in Box A.2 below.

Box A2. Measuring changes in consumer surplus

The effects of changing regulations can often be examined as movements from one point on the demand curve to another. For many regulations that have the effect of limiting supply or raising prices, an estimate of consumer benefit or harm with the change from one equilibrium to another can be calculated. Graphically, the change is illustrated by a constant elasticity demand curve. E_r shows the equilibrium with restrictive regulation and E_c shows the equilibrium point with competition regulation. Competition equilibrium is different from restrictive-regulation equilibrium in two important ways: lower price and higher quantity. These properties are a well-known result of many models of competition.

Figure A.1. Changes in consumer surplus



Source: Ennis, S. (2017), "Estimating consumer benefits of pro-market regulatory reform", draft working paper, Competition Division, OECD, January 2017

Under the assumption of constant elasticity of demand the equation for consumer benefit is:

$$CB = C + D \approx (P_r - P_c)Q_r + \frac{1}{2}(P_r - P_c)(Q_c - Q_r)$$

Where price changes are expected, a basic formula for such a standard measure of consumer benefit from eliminating the restriction is:

$$CB = \left(\rho + \frac{1}{2}\epsilon\rho^2\right)R_r$$

where CB represents consumer harm, ρ represents the percentage change in price related to the restriction, R represents sector revenue, and ε is demand elasticity.

When elasticity is not known, it is worth noting that if |ε|=2, which would correspond to more elastic demand than in a monopoly market, but also far from perfectly elastic as in a competitive market, the expression above simplifies to:

$$CB = (\rho + \rho^2)R_r$$

Source: OECD (2017c)

In a workshop in July 2018, the OECD presented preliminary recommendations to the relevant Mexican authorities and asked for their views on recommendations. Their comments were taken into account when deciding on final recommendations.

In total, 72 recommendations were submitted to the Mexican Ministry of Economy in October 2018.

Capacity building

Another important work stream in the project was to provide assistance in building up the competition-assessment capabilities of the Mexican administration. To this end, officials from the relevant Mexican authorities participated in two full-day workshops in order to gain exposure to the application of the OECD *Competition Assessment Toolkit*. Experts participated from the Ministry of Economy (*Secretaría de Economía, SE*); Ministry of Energy (*Secretaría de Energía, SENER*); Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público, SHCP*); National Hydrocarbons Commission (*Comisión Nacional de Hidrocarburos, CNH*); Federal Economic Competition Commission (*Comisión Federal de Competencia Económica, COFECE*); Energy Regulatory Commission (*Comisión Reguladora de Energía, CRE*); Agency for Safety, Energy and Environment (*Agencia de Seguridad, Energía y Ambiente, ASEA*); National Centre for Control of Energy (*Centro Nacional de Control de Energía, CENACE*); National Centre for Control of Natural Gas (*Centro Nacional de Control de Gas Natural, CENAGAS*); National Council of Science and Technology (*Consejo Nacional de Ciencia y Tecnología, CONACYT*); National Commission for Efficient Energy Use (*Comisión Nacional para el Uso Eficiente de la Energía, CONUEE);* Mexican Petroleum Institute (*Instituto Mexicano del Petróleo, IMP*); Ministry of Economy Federal Attorney's Office of Consumer (*Procuraduría Federal del Consumidor, PROFECO*); Government of Mexico City (*Gobierno de la Ciudad de México*); and the Federal Electricity Commission (*Comisión Federal de Electricidad, CFE*).

More specifically, at the beginning of the project in February 2018, the OECD organised a workshop that provided an overview of the Mexican Competition Assessment Project, and gave an introduction to competition policy and the OECD *Competition Assessment Toolkit*. The workshop explained the tasks in Stage 1 and 2 and explained the principles for screening of legislation. In July 2018, the OECD held an additional full-day workshop at which the methodology for qualitative and quantitative analysis of restrictive provisions was discussed and preliminary results were presented. The OECD team discussed harm to competition with reference to specific provisions and asked for feedback on possible alternatives to achieve the same policy objectives while minimising harm.

Notes

[1] www.diputados.gob.mx/LeyesBiblio/index.htm (accessed 16 September 2018).

[2] http://dof.gob.mx/ (accessed 16 September 2018).

[3] http://legislacion.scjn.gob.mx/Buscador/Paginas/Buscar.aspx (accessed 16 September 2018).

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OECD (2017a), *Competition Assessment Toolkit: Volume 1: Principles*, www.oecd.org/daf/competition/46193173.pdf.

OECD (2017b), *Competition Assessment Toolkit: Volume 2: Guidance*, www.oecd.org/daf/competition/45544507.pdf.

OECD (2017c), *Competition Assessment Toolkit, Volume 3: Operational Manual,* www.oecd.org/daf/competition/COMP_Toolkit_Vol.3_ENG_2015.pdf.

Annex B. Legislation screening by sector

Gas upstream restrictions

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
1	Lineamientos para la elaboración y presentación de los costos, gastos e inversiones; la procura de bienes y servicios en los contratos y asignaciones; la verificación contable y financiera de los contratos, y la actualización de regalías en contratos y del derecho de extracción de hidrocarburos. DOF 06-03-2015 Modificación a los Lineamientos	Law: Article 35, section I	Exploration and extraction of hydrocarbons / Subcontracting	For the exploration and extraction of hydrocarbons in Mexican territory, the federal government can either use an assignment to grant areas and their mineral rights to PEMEX or other state productive enterprises (SPEs), or award contracts for hydrocarbon production rights to private companies or SPEs. The Hydrocarbons Law defines assignments as an administrative juridical act through which Mexico's federal executive grants an SPE the exclusive right to carry out exploration and extraction activities within a defined area for a determined duration. Contracts are defined in the Hydrocarbons Law as a	SHCP	A3	The provision establishes regulations on how private companies should contract or purchase goods and services; this might increase their costs as they are forced to run tender procedures even for comparatively small amounts. Also, private companies are limited in their freedom to choose suppliers.	The requirement to hold tender procedures even for private parties subcontracting other private companies might be a way to strengthen the competitive process along the value chain as it guarantees smaller companies can be subcontracted, despite not having a commercial relation with larger contractors or assignees. This requirement ensures fair conditions for participation and that when subcontracting the best offer is chosen. There is the danger, however, that subcontracting is used by companies to enter into bid-rigging schemes: one company agrees to	The OECD recommends that private companies should be able to select their suppliers freely. They should however, have to report all their subcontracting to CNH in order to detect and prevent collusive agreements between companies that initially competed in the contract tender process (or did not participate due to an agreement). Additionally, the OECD recommends adding a clause to all calls for tenders to require companies to reveal any intention to subcontract and then report any subsequent subcontracting, as well as the selection criteria. No recommendation concerning SPEs.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	para la elaboración y presentación de los costos, gastos e inversiones; la procura de bienes y servicios en los contratos y asignaciones; la verificación contable y financiera de los contratos, y la actualización de regalías en contratos y del derecho de extracción de hidrocarburos. DOF: 06-07-2015 Modificación a los Lineamientos para la elaboración y presentación de los costos, gastos e inversiones; la procura de bienes y servicios en los contratos y asignaciones; la verificación			juridical act signed between CNH acting for the Mexican state and an SPE or private company, with the latter party committing to carry out exploration and extraction activities within a defined area for a determined duration. Contracts are generally granted through a tendering process in which both SPEs and private companies can participate. According to the Lineamientos para la elaboración y presentación de los costos, gastos e inversiones; la procura de bienes y servicios en los contratos y asignaciones; la verificación contable y financiera de los contratos, y la actualización de regalías en contratos y del derecho de extracción de hidrocarburos, if an assignee or a contractor subcontracts or makes acquisitions for amounts lower than USD 5 million, the assignee or contractor can use any selection procedure it chooses. If the amount is between USD 5 million and USD 20 million,				withdraw or lose its bid so another company can win, and the winner then reciprocates by subcontracting to the other company. As such, it is a good practice to impel contractors to report to CNH any planned subcontracting in their original offer, and then report any subsequent subcontracting, as well as the selection criteria.	

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	contable y financiera de los contratos, y la actualización de regalías en contratos y del derecho de extracción de hidrocarburos. DOF: 28-11-2016			the assignee or contractor must choose its provider using the "restricted-invitation procedure" in which at least three companies are invited to submit offers and the contract is awarded to the best in terms of quality and price. Finally, for amounts over USD 20 million, the assignee or contractor must run a tender procedure. These thresholds apply to both private companies and SPEs, since a contractor can be an SPE or a private company. Additional legislation establishes procurement rules for SPEs. For instance, for PEMEX, Article 50 of the Reglamento de la Ley de Petróleos Mexicanos requires the company to run a public tender for any subcontracting or purchasing worth more than MXN 3 million. This threshold is considerably lower than that established in the general guidelines discussed above. According to PEMEX, it is the company's internal policy that when two criteria apply (in this case, two different thresholds for an obligation to run a tender), it uses the most stringent one, in this case, the lower threshold.					

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
2	Call for tenders. Preconditions to be fulfilled in order to participate in a tender process.	N/A	Call for tenders / Barrier to entry	In order to participate in tender procedures for contracts for the exploration and extraction of hydrocarbons, SPEs and private companies must fulfil certain preconditions; these are usually established in the calls for tender. Preconditions vary depending on the type of terrain for which rights are being tendered (e.g. shallow water, deep water, inland) and the type of activity to be carried out. For instance, tenders for terrestrial oil and gas extraction usually have fewer financial requirements (such as net worth, total investments, and credit rating of a company's assets, both in Mexico and abroad) than tenders for extracting oil and gas in shallow and deep water. A company wanting to participate in a tender needs to pre-qualify anew for each tender even if it participated in the same year in a tender that had the same or even stricter requirements.	CNH	A3	Several market participants have claimed that preconditions for participating in tenders can be excessive. This increases participation costs.	To ensure that only companies or SPEs able fulfil contracts are allowed to participate in tender procedures. According to CNH requirements, each tender is case specific and as such needs to be modified accordingly. Conditions change based on the type of terrain being tendered and the type of activity. For instance, for onshore regions, CNH will chose conditions that are easier to fulfil in order to allow smaller companies to participate in the exploration and extraction activities. Since 2018, CNH has been allowing companies that have presented documents in a previous pre-qualification simply to state they have done so rather than having to re-present them. CNH says it is currently working on a registry of pre-qualified participants in order to avoid private companies or SPEs having to incur unnecessary extra costs for re-presentation of documents.	The OECD recommends as much as possible standardising preconditions that private companies and SPEs are required to fulfil in order to participate in tenders for contracts. These standard conditions can then be modified, if necessary, on a case-by-case basis. Furthermore, the OECD suggests introducing a registry for pre-qualified tender participants in order to avoid private companies or SPEs having to prove compliance with the same requirements more than once. The conditions sould be, however, be regularly verified (e.g. every five years) to ensure that the company in question still complies with all of them.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
								International comparison In Colombia, the requirements for participating in tender procedures are all published in the terms of reference (*términos de referencia*) of each round of tenders. If a company is pre-qualified for difficult terrains, it also pre-qualifies for a tender for easier terrains. Qualification, however, only applies for each round (a set of tenders all taking place in the same year) as a company's financial capacities can change over time. (See, http://ronda2014.anh.gov.co/rondacolombia2014/index.php/2-terminos-de-referencia/minuta-del-contrato.)	
3	Ley de Hidrocarburos. Last reform: DOF: 15-11-2016 Reglamento de la Ley de Hidrocarburos. DOF: 31-10-2014 Disposiciones Administrativas	Law: Article 27 Bylaw: articles 51, 52, 53 General Administrative Provisions: general	Natural-gas extraction / Restrictions on participation	The Ministry of Economy (*Secretaría de Economía, SE*), with assistance from the Ministry of Energy (*Secretaría de Energía, SENER*), grants concessions for the exploitation of coal mines. If a concession holder discovers that one of its mineral-coal seams also	SE, SENER, CNH	A3	Assigning contracts for the exploration and extraction of natural gas in coal mines directly to holders of a mining concession without having an open tender procedure prevents other companies that might be more efficient than the concession holder from	Having two different companies operating at the same mineral-coal seam – one extracting coal, the other natural gas – may raise technical problems, as well as security issues that can lead to accidents. Gas from coal seams, for example, is highly	No recommendation.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	de Carácter General mediante las que se determinan los requisitos que deberán incluir las solicitudes de los titulares de una concesión minera que están interesados en obtener la adjudicación directa de un Contrato para la Exploración y Extracción de Gas Natural asociado a la Veta de Carbón Mineral y producido por la misma. DOF: 09-12-2015			contains natural gas, CNH can grant it an additional concession for the exploration and extraction of the gas without the need for a tender process. The mining-concession holder must prove to SENER that it has the technical, administrative and financial capabilities to carry out the exploration and extraction of the natural gas contained in the mineral-coal seam. If the mining-concession holder is not interested or does not qualify for such a concession, CNH can grant production rights to another company either through an assignment or through a tender process. If the exploration and extraction of natural gas contained in the mineral-coal seam has the potential to damage the holder of the mining concession, a 90-day negotiation period will begin so the mining-concession holder and the contractor or assignee can reach an agreement on appropriate compensation. If no agreement is reached, then CNH, with the assistance of			competing for these contracts. A tender process will only be carried out if the mining concession holder is not interested in exploring and extracting natural gas or if it does not have the technical, administrative and financial capabilities to do so.	flammable, making it important that the natural gas is worked before the coal-seam gas, while security issues due to a lack of communication might arise if two companies operate in the same area. In addition, as mining-concession holders are probably exempted from a tender process. Running the same seam to extract coal and gas will allow for economies of scale and scope. The current system has the advantage that disputes over rights to explore and extract coal-seam gas are minimised. Finally, market participants specialised in the extraction and exploration of hydrocarbons (that is, non-mining companies) have shown little interest in accessing coal-seam gas deposits in Mexico. **International comparison** Different models exist for the allocation of the rights to extract coal-seam gas. One approach consists of treating coal-seam gas as part of the coal estate and	

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
				the relevant authorities, will determine if both activities (i.e. coal and natural gas extraction) can coexist. In that case, CNH will establish the compensation to be paid to the mining-concession holder; this must lie between 0.5% and 2% of the assignee or contractor's post-tax profits. The provision is not quite clear on the exact formula for calculating this compensation, but the percentages likely refers to any profits from gas exploration in the mineral-coal seam.				assigning extraction rights to coal companies. This approach is followed in Germany, where rights to extract coal-seam gas are automatically granted to coal-mining companies for the duration of the mining concession. Companies must prove, however, that they have put in place plans sufficient for the activities and that they will happen within an acceptable time frame for the type, scope and purpose of extracting coal-seam gas. In the United States, there is no uniform framework for assigning the exploration and extraction rights of coal-seam gas. In general, the land owner can assign total rights or split rights. This partly stems from the legal concept known as "split estates", a US common-law term that implies that the landowners control what is on the surface (surface state), whereas other owners (e.g. mining company) can own or lease the right to extract	

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
								minerals or gas (mineral state). Another form of split-estate ownership occurs when minerals have been retained by the federal government. However, many lands in western states of the US were previously transferred into private ownership through congressional acts such as the 1916 Stock-Raising Homestead Act (see https://grs-global.com/2017/08/split-estates-the-impact-of-mineral-rights-on-property-values-and-use). In general, following the precedent of Ohio Oil Co. v. Indiana (1900), coal lease holders do not have automatic rights to coal-seam gas and must reach an agreement with gas leaseholders, surface owners and the government. As a consequence, in the United States, there have been repeated controversies regarding the ownership of coal-seam gas, with disputes settled on a case-by-case	

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
								basis depending on individual lease contracts between surface owners and mineral-rights leaseholders. (See, the US Environmental Protection Agency's 2009 *Analysis of International Best Practices for Coal Mine Methane Recovery and Utilization*, www.epa.gov/sites/production/files/2016-03/documents/analysis_best_practices.pdf and https://journals.library.ualberta.ca/functiontesting/index.php/functiontesting/article/viewFile/29260/21503)	
4	Disposiciones Administrativas de Carácter General en materia de autorizaciones para el reconocimiento y exploración superficial de hidrocarburos. DOF: 26-01-2015 Modificaciones a diversos artículos de las Disposiciones administrativas	Article 10, section II and III	Qualifications / Barrier to entry	According to Article 10, section II a company applying for an authorisation for surface prospection and exploration – a study on land or at sea that aims to determine the presence of hydrocarbons within a defined area – must provide CNH with information and documentation that proves that it has the technical, operational and financial capabilities to carry out those activities, and that it complies with all relevant	CNH	A2, A3	The original 2015 provision was unclear about whether international experience was regarded as equivalent to Mexican experience, which would discriminate against non-Mexican companies. The legislation was amended on 24 May 2018 and now explicitly allows for international experience or the hiring of a person with three years' experience in	The objective is to guarantee that only capable and reliable companies are granted an authorisation for surface inspection and exploration. **International comparison** In the EU, five years' experience is more often required. (See, for example, http://ec.europa.eu/environment/integration/energy/pdf/Tender%20specifications.pdf)	No recommendation.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	de carácter general, en materia de autorizaciones para el reconocimiento y exploración superficial de hidrocarburos. DOF: 15-04-2015 Acuerdo CNH.E.31.001/17 mediante el cual la Comisión Nacional de Hidrocarburos modifica los artículos 15, primer párrafo y las fracciones I y II; 26, en su encabezado; 27 y 39, y adiciona una fracción III al artículo 15 y un segundo párrafo al artículo 26 de las Disposiciones Administrativas de Carácter General, en materia de			norms and standards. In particular, the company must prove that it has at least five years of experience in the activities of surface prospection and exploration. The provision does not, however, explicitly state if this experience must be national or if it can also be international. Article 10, section III of the original 2015 provision additionally states that "to verify the authenticity and truthfulness of information provided by applicants, the Commission (CNH) will be able to establish mechanisms on the basis of inter-institutional co-ordination, both at the national and international level". In practice, according to market participants, foreign experience is accepted. Also, if the company applying for authorisation does not have the experience required, it can collaborate with another company or hire staff that do have the necessary experience CNH and market participants do not believe the provision is problematic.			place of demonstrating that the company itself has the necessary experience.		

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	autorizaciones para el reconocimiento y exploración superficial de hidrocarburos. DOF: 16-08-2017 Acuerdo CNH.02.001/18 por el que se modifican, adicionan y derogan diversos artículos de las Disposiciones Administrativas de Carácter General, en materia de autorizaciones para el reconocimiento y exploración superficial. DOF: 24-05-2018								
5	Decreto por el que se reforman y adicionan diversas disposiciones de la Constitución Política de los Estados	Decree: Article 7 Law: Article 46 and transitory article 24 2017 Agreeme nt: Article	Exploration and extraction of hydrocarbons / National content	The 2013 Energy Reform decree establishes that, in order to promote the participation of national enterprises at all levels of the energy-sector value chain, a minimum percentage of national content should be used, including in the exploration	SE, SENER, SEGOB	A3, B4	Complying with the minimum national-content requirement, might increase the costs of assignees and contractors as they might have to use more expensive Mexican products in spite of possibly cheaper or	The objective of the provision is to support Mexican companies that operate in the hydrocarbons industry. The OECD understands that the SE is in the process of issuing a new more simplified "information report" that	Clarify the methodology for companies to easily calculate and measure the national content they use. The OECD does not make any other recommendation concerning national content or the minimum

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	Unidos Mexicanos, en Materia de Energía. DOF: 20-12-2013 Ley de Hidrocarburos. Last reform: DOF, 15-11-2016 Acuerdo por el que se establece la Metodología para la Medición del Contenido Nacional en Asignaciones y Contratos para la Exploración y Extracción de Hidrocarburos, así como para los permisos en la Industria de Hidrocarburos. DOF: 13-11-2014 Acuerdo que modifica al diverso por el que se establece la Metodología para la	16		and extraction phase. Based on this, the Hydrocarbons Law, published in the National Official Gazette (Diario Oficial de la Federación, DOF) on 13 November 2014, states that for activities of exploration and extraction of hydrocarbons carried out in Mexican territory, assignees and contractors have to use a mandatory minimum percentage of national content. The law defines assignees as SPEs that have been assigned an exploration area; contractors are SPEs or private enterprises that have won a contract for exploration and extraction. The average share of national content for these activities was 25% in 2015, set to increase gradually to at least 35% by 2025. After 2025, the share of national content will be reviewed by the Ministry of Economy (*Secretaría de Economía, SE)* every five years. These targets do not apply to the exploration and extraction of hydrocarbons in deep			higher-quality foreign products being available. Also, foreign suppliers might suffer discrimination. Finally, companies not being sure about what methodology to use to calculate national content might overfulfil their obligation in order to be sure of acting legally.	should clarify the calculation of national content for the industry. All operators will use this report to detail the national content they use, as set out in to Article 16 of the Agreement that establishes the provisions for assignees, contractors and permit holders to provide information on national content in their activities in the hydrocarbon industry (Acuerdo por el que se establecen las disposiciones para que los asignatarios, contratistas y permisionarios proporcionen información sobre contenido nacional en las actividades que realicen en la industria de hidrocarburos). This information report can be downloaded (www.gob.mx/cms/uploads/attachment/file/229672/Formato_de_Informe_de_Contenido_Nacional_de_la_actividad_de_la_Industria_de_Hidrocarburos_en_que_participe.pdf); it must be filled and delivered in	percentage of national content companies have to use, since helping the national industry is a legitimate objective. The Mexican government should be aware, however, that requiring companies to use national content will make natural exploration and production more expensive and that the obligation to use national-content clauses should be accompanies by knowledge transfer, so that local companies become more competitive both in the Mexican and the international markets.

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	Medición del Contenido Nacional en Asignaciones y Contratos para la Exploración y Extracción de Hidrocarburos, así como para los permisos en la Industria de Hidrocarburos. DOF: 16-07-2015 Acuerdo por el que se establecen las disposiciones para que los asignatarios, contratistas y permisionarios proporcionen información sobre contenido nacional en las actividades que realicen en la industria de hidrocarburos. DOF: 26-05-2017			and ultra-deep waters, for which the national content requirement is established separately by the SE. The SE, with the collaboration of the Ministry of Energy (*Secretaría de Energía, SENER*), has been responsible for establishing a methodology for the measurement of national content in assignments and contracts; this was first published through an agreement in the DOF on 13 November 2014. According to Article 46 of the Hydrocarbons Law, when calculating the percentage of national content, the following criteria should be included: 1) purchase of goods and contracting of services, depending on origin; 2) qualified Mexican labour; 3) training of Mexican labour; 4) investment in local and regional infrastructure; and 5) technology transfer. Both the Energy Reform decree and the Hydrocarbons Law state that the national-content requirement will be applied without prejudice to				person to the Ministry of Economy on an annual basis or whenever there is any major change to a company's calculations. **International comparison** Similar local content policies (LCP) have been implemented in the oil and gas sectors of countries including Angola, Brazil, Indonesia, Kazakhstan and Trinidad and Tobago. According to a 2013 World Bank report, *Local Content Policies in the Oil and Gas Sector*, LCP can yield mixed results (see, http://documents.worldbank.org/curated/en/549241468326687019/pdf/789940REVISED000Box377371B00PUBLIC0.pdf). While this report does not advocate in favour or against LCP, analysed case studies seem to suggest that certain factors are needed for LCP to be successful in improving the economy, including local companies having basic technological levels and industrial capacity, and financial strength, and local	

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				international treaties entered into by Mexico. According to industry participants, in practice, it is very difficult to keep track of whether a company complies with the regulation on minimum national content since all the suppliers used by exploration and extraction companies (who have their own sub-contractors and, in turn, their sub-contractors) have to be taken into account. Market participants claim to face uncertainty concerning which accountability methodologies to use in order to estimate whether they comply with the requirements of the provision.				markets being competitive. The report suggests that governments interested in implementing LCP should assess the extent to which it supports the development of adequate local skills; promotes competition and the emergence of an efficient domestic economy; and fosters technology and spillover effects. In the European Union, Directive 2014/24/EU, 2014/25EU (Utilities Directive) and 2014/23/EC (Concession Directive) foresee that national companies cannot be favoured within the EU. However, exploration and production of gas can be exempted from the rules of public procurement. (Article 7, paragraph 2 and Annex III Concession Directive, also Recital 25 Utilities Directive). In some hydrocarbons-rich Gulf states (such as Qatar) with small populations, national-content policies have proved an issue as the	

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								limited labour force restricts supply and makes the cost of using local labourers extremely high. In Mexico, with its large labour force and relatively low wages, this does not seem to be an issue.	
6	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016	Article 128	Exploration and extraction of hydrocarbons / Restricts participation of foreign companies	According to the Hydrocarbons Law, when issuing permits and granting assignments and contracts for the exploration and extraction of gas, SENER, CNH and CRE, taking account of the opinion of SE, must include in the terms and conditions a clause stating that under "equivalent conditions" of price, quality and timely delivery, assignees, contractors and permit holders must contract Mexican goods and services. The Hydrocarbons Law does not define what "equivalent conditions" means exactly. It is therefore unclear how it is determined when conditions are indeed "equivalent" since two offers will almost never be identical in terms of price, quality and delivery.	SENER, CNH, CRE, SE	A3	Foreign or Mexican suppliers selling foreign goods and services might suffer discrimination as they will have to offer better conditions than their Mexican counterparts in order to be contracted. Furthermore, it is unclear how it is determined what "equivalent conditions" means as two offers can never be identical.	The objective of the provision is to promote and support the development of the Mexican industry by supporting Mexican providers serving holders of permits for activities regulated by the Hydrocarbons Law or assignees and contractors for the exploration and extraction of hydrocarbons. **International comparison** According to a 2013 World Bank report, *Local Content Policies in the Oil and Gas Sector*, (see, http://documents.worldbank.org/curated/en/549241468326687019/pdf/789940REVISED000Box377371B00PUBLIC0.pdf), which analysed local-content policies in six oil- and gas-producing countries, national systems varied to	The OECD recommends that the Mexican government abolishes the part of the provision related to the preference for national staff or nationally produced goods under equal circumstances. A transition period could be foreseen to grant Mexican companies time to adapt to new market conditions. Alternatively, the Mexican Government should consider issuing guidelines in order to clarify how to determine when circumstances are equal in which case the preference for national products and labour should apply.

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								large degrees. The report recommends having clearly defined and measurable policies for national content, as well as policies that support improving skill levels in local populations.	
7	Lineamientos para la elaboración y presentación de los costos, gastos e inversiones; la procura de bienes y servicios en los contratos y asignaciones; la verificación contable y financiera de los contratos, y la actualización de regalías en contratos y del derecho de extracción de hidrocarburos. DOF: 06-03-2015 Modificación a los Lineamientos para la elaboración y	Article 32, sections II and III	Exploration and extraction of hydrocarbons / Restricts participation of foreign companies	For exploration and extraction of hydrocarbons carried out in Mexican territory, the Mexican government can either grant assignments to SPEs or contracts to private companies or SPEs. Subcontracting (i.e. acquisitions and contracts) undertaken by assignees and contractors is regulated in terms of national origin of subcontracted goods and services. In particular: 1) contractors or assignees must hire local companies if they offer "equivalent conditions to the existing ones in the international market, including quality, availability and price"; 2) contractors or assignees must preferably buy "nationally produced materials, equipment and other goods, if they are offered under 'equivalent	SHCP	A3	As there is no clear definition of what constitutes equivalent conditions in an offer or "market rules" to identify the best offer, there is a risk of discretionary behaviour that may lead to one company being unfairly treated when compared to another. Also, foreign or Mexican suppliers participating with foreign products or services might be discriminated against.	To promote and aid the development of the national industry. **International comparison** According to a 2013 World Bank report, *Local Content Policies in the Oil and Gas Sector*, (see, http://documents.worldbank.org/curated/en/549241468326687019/pdf/789940REVISED000Box377371B00PUBLIC0.pdf), which analysed local-content policies in six oil- and gas-producing countries, national systems varied to large degrees. The report recommends having clearly defined and measurable policies for national content, as well as policies that support improving skill levels in local populations.	The OECD recommends that the Mexican government abolishes the part of the provision related to the preference for national staff or nationally produced goods under equal circumstances. A transition period could be foreseen to grant Mexican companies time to adapt to new market conditions. Alternatively, the Mexican Government should consider issuing guidelines in order to clarify how to determine when circumstances are equal in which case the preference for national products and labour should apply.

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	presentación de los costos, gastos e inversiones; la procura de bienes y servicios en los contratos y asignaciones; la verificación contable y financiera de los contratos, y la actualización de regalías en contratos y del derecho de extracción de hidrocarburos. DOF: 06-07-2015 Modificación a los Lineamientos para la elaboración y presentación de los costos, gastos e inversiones; la procura de bienes y servicios en los contratos y asignaciones; la verificación contable y financiera de			conditions' to those available in the international market, including in terms of quantity, quality, delivery dates and price". In both cases, the best offer should be determined according to "market rules", which are defined as a "competition principle under which the parties involved in a transaction are independent and participate under equivalent conditions and out of self-interest". The guidelines do not contain a definition of "equivalent conditions" so it is not clear how they are determined, since two offers are almost never identical in terms of quantity, quality, delivery dates and prices.					

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	los contratos, y la actualización de regalías en contratos y del derecho de extracción de hidrocarburos. DOF: 28-11-2016								
8	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016	Article 121	Exploration and extraction of hydrocarbons / Social-impact study	SENER, with the collaboration of the Ministry of Interior (*Secretaría de Gobernación, SEGOB*) and other relevant authorities, will undertake a social-impact study (*estudio de impacto social*) before running tenders for contracts for the exploration and extraction of hydrocarbons or before assigning an area to an SPE. This study is then shared with potential contractors in the call for tender and enables them to know about vulnerable populations present in the areas where the assignment or contract activities will take place. The social-impact study is not to be confused with the social-impact assessment (*evaluación de impacto social*), which must be elaborated by winning assignees or contractors post-tender. Assignees or	SENER	A2	Due to limited human resources, it can take SENER's General Directorate of Social Impact and Surface Occupation a significant amount of time to analyse social-impact assessments and to issue resolutions with follow-up recommendations. As a consequence, additional suppliers might be delayed in entering the market. Before publishing of the methodology for the elaboration and submission of social-impact assessments in June 2018, there was also confusion among contractors and assignees about how to elaborate and include the assessment. This problem has been resolved with the new legislation.	Social-impact studies elaborated by SENER and social-impact assessments submitted by contractors or assignees, aim to ensure that hydrocarbons projects have a positive impact on local communities, local land use and the rights of vulnerable social groups. **International comparison** Worldwide, social-impact assessments are a standard project planning tool. This kind of assessment analyses short-term and long-term impacts and risks. Legislation usually requires assessments to be prepared by qualified and registered experts. Sometimes, governments require applicants to carry out the assessments; this, however, could lead to a	Grant sufficient resources to SENER's General Directorate of Social Impact and Surface Occupation so it can issue resolutions in shorter time frames. Costs may be passed onto assignees or contractors as a fee for the analysis of social-impact assessment submissions.

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				contractors can use the social-impact study, among other elements (e.g. fieldwork, interviews in the concerned community, official statistics), as a basis for their social-impact assessment. This assessment contains the identification, description, forecast and financial consequences of the social impacts that exploration or extraction activities could create, as well as any possible mitigation measures. Contractors have to submit their social-impact assessment to SENER's General Directorate of Social Impact and Surface Occupation (Dirección General de Impacto Social y Ocupación Superficial). In turn, this directorate has 90 working days to issue a resolution containing any recommendations for the implementation of the social-impact assessment. Within the first 30 working days, the directorate can demand additional information, and assignees or contractors have 20 working days to provide it. An information demand pauses the				conflict of interest, as they are the beneficiaries of the projects being assessed. In Germany, for example, authorities undertake extensive planning, including social planning, which might include drastic measures such as the relocation of entire villages (e.g. Garzweiler II). Courts have confirmed that authorities might undertake such far-reaching measures. For example, the European Court of Human Rights rejected the claim of the inhabitants of a village that was destroyed and replaced by an open-cast mine (Judgment No. 46346/99 of 20 May 2000 – Guenther Noack, et al. v. Germany).	

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				90-working-day timeline. According to market participants, the General Directorate of Social Impact and Surface Occupation has limited staff and, as a consequence, the analysis of social-impact assessment submissions can take a considerable amount of time. On 1 June 2018, SENER issued in the DOF, the Agreement for the Issue of the General Administrative Provisions on the Social-Impact Assessment in the Energy Sector (Acuerdo por el que se emiten las Disposiciones Administrativas de Carácter General sobre la Evaluación de Impacto Social en el Sector Energético), which sets a methodology for the elaboration and submission of social-impact assessments by contractors or assignees, as well as for the issuance of SENER resolutions and recommendations. This new regulation could potentially simplify the analysis of social-impact assessment submissions and reduce resolution times.					

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9	Ley Aduanera. Last reform: DOF, 25-06-2018	Article 59, section IV	Imports / Double registry	Importers of hydrocarbons must be included in the Registry of Importers (Padrón de Importadores), as well as the Registry of Importers of the Hydrocarbons Sector (Padrón de Importadores Sectorial de Hidrocarburos). Both registries are held by the Tax Administration Service (Servicio de Administración Tributaria, SAT). To be entered into both registries, companies must, among other requirements, be up to date with their tax obligations and prove that they have a Federal Registry of Taxpayers number (Registro Federal de Contribuyentes, RFC). The information importing companies must provide to the Registry of Importers of the Hydrocarbons Sector for each transaction includes from whom they will buy the gas or natural gas and to whom they will sell it, as well as proof that their clients have CRE permits for storage or distribution. Although this information is not directly required by law, Article 59	SAT	A2, A5	The requirement for importers to name their buyers in advance might inhibit imports of LPG and natural gas. Some market participants have described these entry conditions as excessive. Also, requiring applicants to provide a list of clients to whom they will sell imported products might delay imports, since importers may not yet know potential clients.	The objective of both registries is to control the flow of imports, and to prevent any fraudulent customs activity.	Eliminate the requirement that importers have to indicate in advance to whom they will sell imported LPG or natural-gas products.

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				of the Customs Law (Ley Aduanera) does state that the registry must be completed, and as the information in question is needed to complete the registry according to the guide published by the SAT, it is de facto compulsory. The information must be provided ex ante. (See, http://omawww.sat.gob.mx/aduanas/tramites_autorizaciones/guia_padrones/Documents/Padr%C3%B3n/Gu%C3%ADa%20P%C3%BAblica%20PISE%20mayo%202018%20VF%20(20180525)%20SECTOR_13.pdf .)					
10	Lineamientos que regulan el procedimiento de cuantificación y certificación de Reservas de la Nación. DOF: 20-12-2017	Article 33, V, b)	Qualifications / Barrier to entry	For exploration and extraction of hydrocarbons carried out on Mexican territory, assignees as well as contractors have to submit annual reports about the quantify of reserves (i.e. 1P, 2P, 3P) to CNH. These must be certified by independent third parties (*terceros independientes*), experts on the classification, analysis, estimation, assessment and certification of reserves. The assignee or contractor	CNH, Centro Nacional de Información de Hidrocarburos (CNIH)	A3	Foreign applicants might be prevented from applying as it is unclear whether experience from abroad is regarded as equivalent to national experience. Market participants, however, have not complained about the low number of independent third parties or the high charges for their services.	To ensure that reliable professionals carry out the estimation of existing reserves of hydrocarbons in Mexican territory.	Clarify in the legislation that international experience is regarded as equivalent to experience in Mexico. No recommendation for the requirement for the length of experience for third parties as this is a valid objective and the provision allows for a sufficient number of market participants.

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				and independent third party have to submit their respective estimates of reserves to CNH, which then checks if both estimates are consistent. One requirement to be an independent third party is having at least ten years' experience in the oil and gas industry in areas such as exploration, geology, geophysics, reservoir engineering, production or economic assessment. Third parties can also hire specialists with the relevant experience. The law is not clear about whether international experience is regarded as equivalent to experience in Mexico. A prospective independent third party can apply to be registered with CNH at any time and, if accepted, will be registered for three years. As of September 2018, there were 15 registered independent third parties. (See, www.gob.mx/cnh/documentos/inscripcion-al-padron-de-terceros-independientes-en-materia-de-reservas)					

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11	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016	Article 4, sections XXIII, XXIV and XXV	Permits, administrative burden / discrimination against foreigners	To be a permit holder for any of the activities described in the Hydrocarbons Law, a foreign company has to create a corporate entity under Mexican law.	SE	A5	Creating a corporate entity under Mexican law involves an extra cost for foreign entrants to the market.	To facilitate the regulation and taxation of foreign companies operating in the Mexican hydrocarbons industry. Comparable requirements exist in other jurisdictions.	No recommendation.
12	Acuerdo por el que se establece la clasificación y codificación de Hidrocarburos y Petrolíferos cuya importación y exportación está sujeta a Permiso Previo por parte de la Secretaría de Energía. DOF: 29-12-2014 Acuerdo que modifica al diverso por el que se establece la clasificación y codificación de Hidrocarburos y Petrolíferos cuya importación y exportación está sujeta a Permiso Previo por parte de la Secretaría de Energía.	2014 Agreement: Article 16, section II	Import permits / Restrictions on participation	In order to import LPG (butane and propane, mixed and liquefied; tariff code 2711.19.01) into Mexico, companies need to obtain a permit from SENER. Before issuing the permit, SENER has to consult the General Directorate of Light Industries (Dirección General de Industrias Ligeras) at the SE. If this directorate considers that national production is sufficient to meet national demand, SENER will not grant an import permit. The directorate also consults with other government bodies, SPE and trade associations. To the best of our understanding, this restriction is compatible with NAFTA, as Annex 603.6 of that agreement stipulates that tariff item 2711 contains goods for	SENER, SE	A2, A5	In practice, if applied, this provision could lead to national producers being protected from foreign competitors. This could lead to national companies producing and selling LPG at higher prices than under competitive conditions. The provision has not been applied so far as currently LPG production in Mexico is running a deficit. Theoretically, because the General Directorate of Light Industries of the SE can consult trade associations to determine if it is necessary to allow or restrict imports into Mexico, these trade associations might argue that the Mexican offer is sufficient to meet national demand in	The objective is to guarantee Mexico's energy self-sufficiency and to keep a balance between national supply and demand. It also allows authorities to remain informed about the amount of imports compared to existing national production in order to ensure there is a sufficient supply of LPG within the country. According to industry participants, the provision does not represent a problem because enough checks and balances exist to prevent any potential abuse.	No recommendation, as to date import licences have always been granted and there seems to be no issue in practice. The SE might consider, however, that no import regulation could be applied even if national LPG production were sufficient as an oversupply would lead to increased competition and likely lower prices for consumers.

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	DOF: 30-12-2015 Acuerdo que modifica al diverso por el que se establece la clasificación y codificación de Hidrocarburos y Petrolíferos, cuya importación y exportación está sujeta a permiso previo por parte de la Secretaría de Energía. DOF: 08-09-2017 Acuerdo que modifica al diverso por el que se establece la clasificación y codificación de Hidrocarburos y Petrolíferos, cuya importación y exportación está sujeta a Permiso Previo por parte de la Secretaría de Energía. DOF: 04-12-2017			which "Mexico may restrict the granting of import and export licences for the sole purpose of reserving foreign trade in these goods to itself". According to industry participants, it is not difficult to obtain an import permit from SENER, the main limitation to importing LPG remains the lack of infrastructure.			order to keep foreign competitors out of the market. Trade associations, however, only advise and have no decisional power.		

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13	Acuerdo por el que se establece la clasificación y codificación de Hidrocarburos y Petrolíferos cuya importación y exportación está sujeta a Permiso Previo por parte de la Secretaría de Energía. DOF: 29-12-2014 Acuerdo que modifica al diverso por el que se establece la clasificación y codificación de Hidrocarburos y Petrolíferos, cuya importación y exportación está sujeta a Permiso Previo por parte de la Secretaría de Energía. DOF: 30-12-2015 Acuerdo que modifica al	2014 Agreement: Article 16, section II	Permits to export / Restricts participation	In order to export liquefied and gaseous natural gas from Mexico (tariff codes 2711.11.01 and 2711.21.01, respectively), companies need to obtain a permit from SENER. In order to grant permits, SENER has to consult the General Directorate of Light Industries of the SE. If this directorate considers that national production is insufficient to meet national demand, SENER will not grant an export permit. This restriction appears compatible with NAFTA, as Annex 603.6 of that agreement stipulates that tariff item 2711 contains goods for which "Mexico may restrict the granting of import and export licenses for the sole purpose of reserving foreign trade in these goods to itself".	SENER, SE	A2, A5	This restriction could hinder Mexican exports of liquefied and gaseous natural gas if the SE deems the gas needs to remain within the country. Investment by companies in Mexico could be hindered if this restriction was an obstacle to accessing international markets.	The objective is to guarantee Mexico's energy self-sufficiency. The restriction aims to maintain a balance between national offer and demand. International comparison Australia uses a similar provision as a last-resource mechanism. On 1 July 2017, the Australian government issued the Australian Domestic Gas Security Mechanism, a regulation that authorises the government to limit LNG exports when companies export more than they supply to the domestic market. This regulation will remain in place until 1 January 2023. Its objective is to ensure that there is a sufficient supply to meet the national demand of natural gas. (See, https://industry.gov.au/resource/UpstreamPetroleum/AustralianLiquefiedNaturalGas/Pages/Australian-Domestic-Gas-Security-Mechanism.aspx.) In the US, 43 U.S. Code §	No recommendation.

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	diverso por el que se establece la clasificación y codificación de hidrocarburos y petrolíferos, cuya importación y exportación está sujeta a permiso previo por parte de la Secretaría de Energía. DOF: 08-09-2017 Acuerdo que modifica al diverso por el que se establece la clasificación y codificación de Hidrocarburos y Petrolíferos, cuya importación y exportación está sujeta a Permiso Previo por parte de la Secretaría de Energía. DOF: 04-12-2017							1354 – Limitations on export of oil or gas, limits the oil and gas that US companies can export without a specific licence. The purpose of this act was to limit the US's reliance on imported fuel following the 1970s oil crisis.	

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14	Absence of guidelines outlining a methodology to determine the duration of contracts and licences for exploration	N/A	Contracts for exploration / Absence of legislation	The Mexican Hydrocarbons Law does not outline any methodology for calculating the durations of contracts for exploration of hydrocarbons. There are therefore no fixed minimum or maximum durations, or set times for possible extensions. Instead, the durations of the contracts are established in the specific calls for tenders. Until now, exploration contracts have always included production – so duration for exploration and production are determined in the same contract.The so-called "initial exploration phase" (*periodo inicial de exploración*) that figures in all exploration contracts seems to be for two years, with an additional two-year extension. This period comprises the surface inspection and exploration phase. PEMEX Exploration and Production (PEMEX Exploración y Producción, PEP) has stated that in its opinion exploration permits should not be longer than six years.	SENER	A4	If exploration contracts are too long, companies might not explore these territories within a timely period. However, this possibility is dealt with in Article 20 of the Hydrocarbons Law, which states that if a contractor does not do any exploration work for more than 180 continuous calendar days, then the state has the power to void the contract. This article appears to be included in every exploration and extraction contract that has been granted to date.	Limiting the duration of exploration agreements would incentivise the exploration and production of gas within a timely period. International comparison In the Netherlands, licences for exploration are for four to eight years. In the UK, offshore licences (territorial waters of Great Britain and waters overlying the UK Continental Shelf, UKCS) are granted for exploration for up to three years. This should allow time for a full and timely exploration of the licensed area. The licence can be revoked if progress within any of the terms is unsatisfactory. In Iceland, a special category exists for exploration-only activities called prospecting. These licences are for three years and are non-exclusive. As such they do not entitle the licensee to drill for or produce hydrocarbons, nor do they give the company priority to obtain such a licence later.	No recommendation, as Article 20 of the Hydrocarbons Law contains a sunset clause that allows a licence to be revoked if it is not used. All contracts up to September 2018 appear to limit exploration to two years, plus one renewal.

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15	Absence of guidelines outlining a methodology to determine the duration of contracts and licences for production	N/A	Contracts for production / Absence of legislation	The Mexican Hydrocarbons Law does not outline any methodology for calculating the duration of contracts for the production of hydrocarbons. There are therefore no fixed minimum or maximum durations, or set times for possible extensions. Instead, the durations of contracts are set out in the specific calls for tenders. According to industry participants, in general, this lack of pre-determined durations has not been an issue, as the durations of production contracts tendered until now have ranged between 25 and 40 years, which are within international standards. PEP believes the production phase should last around 15 years not including the exploration and drilling phases.	SENER	A4	There is the risk that companies that receive lengthy production contracts might wait before exploiting these territories. However, this possibility is dealt with in Article 20 of the Hydrocarbons Law, which states that if a contractor does not fulfil the minimum production quotas outlined in every contract in the exploration plan (*plan de exploración*) or stops production for more than 180 continuous calendar days, then the state has the power to void the contract. This article seems to have been included in every exploration and extraction contract that has been granted to date.	Limiting the duration of exploration or production agreements should incentivise the exploration and production gas within a timely period. International comparison In the Netherlands, licences for production have a duration between 20 and 25 years. An extension to a licence can be granted if the original duration is insufficient for the completion of the licensed activities, and these activities have been carried out in compliance with the licence. In the UK, offshore licences (in territorials waters of Great Britain and waters overlying the UKCS) can be granted for production for a period of 18 years, which should allow the full and timely exploitation of the licensed area. The licence can be revoked if progress within any of the terms is unsatisfactory.	No recommendation, as Article 20 of the Hydrocarbons Law contains a sunset clause that allows an unused licence to be revoked. All contracts up to September 2018 seem to limit production to a maximum of 40 years.
16	Decreto por el que se reforma el diverso por el que se crea el Instituto	7	Self-regulation / Conflict of interest	The Mexican Institute of Petroleum (Instituto Mexicano del Petróleo, IMP) is a public research institution for the oil industry	SENER	B3, C1	PEMEX participation on the board of directors of a research institution providing technical support to the whole oil	PEMEX has a seat on IMP's board of directors so that IMP benefits from the company's large industrial experience and	Amend legislation mentioning rules on independence as to avoid any possible conflict of interest. This should

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	Mexicano del Petróleo como Organismo Descentralizado, publicado el 26 de agosto de 1965. DOF: 31-10-2014			that provides technical goods, such as patented technologies, and services for research and training to develop and educate highly specialised Mexican technicians. It was created in 1965 to support PEMEX. It now provides technical assistance to the whole industry. The IMP has a board of directors consisting of the Minister of Energy, two independent experts and representatives of three universities, as well as the ministers or general directors of SHCP, SEMARNAT and PEMEX.			industry may influence the institution's decision-making process in PEMEX's favour. For instance, IMP may conduct specific research projects to favour PEMEX or PEMEX may have access to sensitive industry data, as well as knowledge of new patented IMP technologies.	knowledge. Industry participants have not voiced any concerns with regard to PEMEX's participation. International comparison According to the IEA, it is common for the CEOs of state-owned oil companies to sit on the board of public energy-research bodies.	include a provision that allows board members to recuse themselves when voting on any matters that could create a possible conflict of interest.
17	Decreto por el que se reforman y adicionan diversas disposiciones de la Constitución Política de los Estados Unidos Mexicanos, en Materia de Energía. DOF: 20-12-2013	Sixth transition article	Compensation / Discrimination	SENER selects areas (*áreas*) to be tendered for the exploration and extraction of hydrocarbons. After the selection of areas, however, CNH is responsible for granting exploration and production contracts through tender processes. According to the 2013 energy reform, if PEMEX invests in the development of a project (for example, PEMEX has financed the seismic study, exploration	SEGOB	B4	The lack of specific guidelines to determine "fair economic value" could affect both PEMEX and its competitors if a payment was over- or underestimated. It cannot be determined whether PEMEX is or not at a competitive disadvantage, as the specific guidelines to determine fair economic value have never been published. Furthermore,	To compensate PEMEX for its investments in areas that are later awarded to other companies and so result in lost profits.	Publish the methodological guidelines used to determine the compensation to PEMEX, and the level of compensation for investments in areas that are later granted to other companies.

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				or even drilling) that is then awarded to a different company, SENER should determine the level of compensation that PEMEX should receive from the production company after estimating the "fair economic value" of the investment cost. According to the Ministry of Interior (*Secretaría de Gobernación, SEGOB*) general guidelines that describe the methodology for calculating "fair economic value" do exist, but remain unpublished. Furthermore, according to PEMEX, in the few cases that have been determined so far (all in midstream cases), PEMEX claims that its compensation was undervalued. (See, http://sil.gobernacion.gob.mx/Archivos/Documentos/2015/02/asun_3204315_20150219_1424362917.pdf.)			the lack of specific guidelines may generate juridical uncertainty for both PEMEX and its competitors.		
18	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016	13	Exploration and extraction / Farmouts	Farmout agreements – also known in Mexico as strategic agreements (*asociaciones estratégicas*) are agreements between an SPE that has been granted an assignment (e.g. the	CNH	A3	PEMEX is only asked for its non-binding opinion after CNH has decided to run a tender process for choosing a farmout partner (i.e. a farmee). An SPE is	SPEs are most likely barred from freely choosing their farmout partners to prevent them partnering with companies that lack the necessary technical expertise or	Allow SPEs to decide when to start a tender procedure, run the process and choose their own farmout partners. The process should be supervised, rather than

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				mineral rights of an area) and a private company that is interested in providing services to the SPE for the project in exchange for a percentage of the profits. The SPE is known as the "farmor", while the private company is known as the "farmee". In Mexico, the usual arrangement of a farmout involves PEMEX being granted an assignment by CNH and then asking CNH for a partner. Mexican legislation allows for two types of farmout agreements: 1) If an SPE had a standing agreement with a private company prior to the Energy Reform and both parties decide that the new legal arrangements are better for both than those allowed before the Energy Reform, then the SPE can ask CNH to transfer the agreement into either a financed public work (*obra pública financiada*), an integral contract (*contrato integral*) or a farmout. This process is known as a "migration with a partner" (*migración con socio*), and is foreseen in Article 13 of the			therefore in a position where it can object to partners but not start a process or freely choose its own partner. This decision-making process could delay new farmout agreements.	financial capabilities. According to CNH, SPEs can request that a farmout procedure be initiated. They can also object to a suggested partner. CNH must guarantee a fair and transparent process. Up to September 2018, CNH had approved three farmout procedures; these took, on average, seven months from publication of call of tenders until the final decision. International comparison The international standard appears to be that most state-owned companies operating in the oil and gas exploration and extraction sector have the freedom to choose their own partners in the context of a farmout agreement. For instance, in Norway, state-owned company Equinor (formerly Statoil) runs its own tender procedures for farmout contracts.	managed, by CNH to guarantee a fair and transparent process.

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				Hydrocarbons Law. Both SPEs and their partners might be interested in this migrations as these types of contracts tend to be less risky and have better terms than those in place before the Energy Reform (e.g. partners can better share risk and profits). 2) When CNH begins a new tendering process to choose a new partner for the SPE. Currently, an SPE is consulted during the pre-qualification stage, but its opinion is not binding. This process is foreseen in Article 14 of the Hydrocarbons Law. For example, if PEMEX has been assigned an area in which it wants to explore and produce hydrocarbons, but does not want to make all the financial investment itself, it might seek a partner. Yet, to do so it needs to ask CNH to hold a farmout-agreement procedure. According to PEMEX, this procedure can be lengthy and dissuade potential partners. According to industry participants, until now only farmout agreements falling under the first scenario have taken place.					

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19	N/A	N/A	Lack of legislation / Processing of natural gas	SENER grants permits for processing natural gas either for one or a set of specific facilities and for a given capacity of production. Currently, PEMEX owns the only nine natural-gas processing plants (*complejos procesadores de gas*) in Mexico. Processing gas is not subject to economic regulation, such as tariffs or open-access obligations.	SENER	B4	Companies wanting to process natural gas in Mexico have to use facilities that belong to PEMEX as there is no alternative. PEMEX could use its market power when negotiating prices and conditions for access.	Mexico has no regulation foreseeing open access to PEMEX's processing facilities, most likely because the facilities are not regarded as a natural monopoly. Currently, market participants do not seem to regard lack of access to processing as a problem. This might change, however, once private companies start producing gas. PEMEX itself stated that it is open to offering processing facilities to third parties. According to PEMEX, its gas-processing facilities currently run at 50% capacity or less. Market participants have pointed out that PEMEX might not have sufficient measurement facilities to differentiate between its own and other companies' gas. International comparison To the best of the OECD's understanding, most countries have no rules about access and tariffs to processing facilities. In 2009, New Zealand	Study the possibility of regulating access to PEMEX's natural-gas processing facilities for a limited time period. The right to access could be limited, for instance, to a five-year period and be granted on a non-discriminatory basis. However, the study might also find strong arguments against a regulation of processing, especially as processing of natural gas is generally not regarded a natural monopoly. Interested parties could choose to either negotiate with PEMEX or if not satisfied with the conditions, build their own processing facilities or use processing facilities abroad.

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								introduced Gas Processing Facilities Information Disclosure Rules, which required that all information regarding the capability and capacity of gas-processing facilities, as well as requests by third parties for accessing these processing facilities be published. This regulation and its effects were then examined by the New Zealand Ministry of Energy and Resources. However, the regulation was not renewed after its expiration on 27 June 2014, as the Ministry of Energy and Resources found that no related competition issues had emerged from access to processing facilities and as such no long-term regulations were needed.	
20	Resolución Núm. RES/389/2014. Resolución por la que se establecen, de manera transitoria, los términos y condiciones a los	Twelfth Recital	Price control / Absence of methodologies	As part of the asymmetrical regulation, prices at which PEMEX sells wet gas (i.e. natural gas containing other compounds than methane, such as butane, propane and ethane) are regulated by CRE. Before the 2013 Energy Reform, PEMEX	CRE	A3, B1	This restriction limits PEP's ability to sell wet gas to other PEMEX subsidiaries as PEP cannot ask the selling price it chooses. PEMEX claims that the regulated price is not a competitive price based	To ensure that PEMEX TRI has a steady supply of wet gas in order to produce dry gas and LPG, among other hydrocarbons. The regulation is part of the strict asymmetrical regulation under which	The OECD recommends that CRE publishes regular (e.g. annual) reports about the status of markets in which PEMEX is subject to asymmetrical regulation. In these reports, CRE should explain the criteria

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	que deberán sujetarse las ventas de primera mano de hidrocarburos, petrolíferos y petroquímicos, y las metodologías para la determinación de sus precios; as como los términos y condiciones a los que deber sujetarse la prestación de los servicios de transporte, almacenamiento, distribución y expendio al público de hidrocarburos, petrolíferos y petroquímicos, y las metodologías para el cálculo de las contraprestaciones de dichos servicios a las que se refiere la Ley de Hidrocarburos. DOF: 03-10-2014			subsidiary PEMEX Exploration and Production (PEMEX Exploración y Producción, PEP), together with the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público, SHCP*) calculated the internal price that PEP could charge to PEMEX subsidiaries for wet gas, among other hydrocarbons. Article 82 of the Hydrocarbons Law establishes that CRE can issue regulations on the terms and conditions, as well as prices for hydrocarbons activities subject to CRE regulation. Therefore, the prices and terms and conditions at which PEP sells wet gas (among other products) to PEMEX Industrial Transformation (PEMEX Transformación Industrial, PEMEX TRI), another PEMEX subsidiary, can be determined by CRE. According to the 12th recital of resolution RES/389/2014, as long as CRE's material and human resources to calculate prices and publish terms			on current market conditions. It also appears that there is no mechanism for PEMEX sales to third parties; PEMEX does not publish a price for third parties.	PEMEX will operate until markets are deemed competitive. According to CRE, this is not yet the case for the wet-gas markets. PEMEX remains the biggest producer of wet gas, so CRE is considering liberalising the price (but not the sales terms and conditions) as this might encourage other companies to process wet gas. To the best of the OECD's knowledge, CRE does not regularly publish reports about the status of the markets in which PEMEX is subject to asymmetrical regulation. CRE claims that it is impossible to issue any fixed criteria (e.g. a market threshold under which PEMEX's market share must fall) that would lead to the asymmetrical regulation being lifted. Instead, it will be necessary to perform a case-by-case evaluation. The OECD could not verify CRE's claim that a lack of resources is preventing it from issuing a price methodology and constantly updating it prices. publishing prices.	on which its evaluation is based for each market and the changes that still need to be made so that asymmetrical regulation can be lifted. The OECD generally supports asymmetrical regulations to introduce competitive conditions into markets that were formerly dominated by a monopoly. However, they must be based on clear criteria and verifiable data. In addition, the OECD recommends that CRE updates and publishes its methodology for calculating wet-gas maximum prices for PEMEX. Prices should be regularly updated and published every month. If CRE is prevented from fulfilling this task due to material or human-resource shortages, it might allow PEP to propose methodologies that CRE could then approve and oversee.

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				and conditions are deemed by CRE itself to be insufficient, the 2014 prices and terms and conditions for selling all hydrocarbons, which include wet natural gas, will continue to be applied. The resolution is not clear, however, about the price level of wet gas sold by PEP to private companies. According to PEP, CRE is planning to issue a price methodology in the near future, though it will not include sales terms and conditions.					
21	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016	17	Compulsory participation of state enterprises / Restrictions on participation of private companies	According to the Hydrocarbons Law, international transboundary reservoirs consist of hydrocarbons reservoirs that lie within Mexican jurisdiction, but continue beyond its territory, as well as reservoirs that lie outside the Mexican jurisdiction and which are shared with other countries according to treaties signed by the Mexican government or pursuant to the United Nations Convention on the Law of the Sea. When assigning exploration and extraction contracts for	SENER, CNH	A3	The requirement discriminates against companies that might be more efficient than PEMEX or other SPEs in the exploration and extraction of international transboundary reservoirs.	Arguably the objective is to maximise national revenues, and to keep some control of international transboundary reservoirs. International comparison In the European Economic Area, several countries, including Norway and Denmark, require state participation in hydrocarbons production as a condition for their licensing regimes. Other countries, including the Netherlands, have the possibility of the state being awarded around	No recommendation. State participation is common in international practice and remains unproblematic as long as the SPE can still take management decisions based upon general commercial principles.

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				which there is a possibility of discovering international transboundary reservoirs, SENER, with the assistance of CNH, will ensure that PEMEX or any other SPE will participate with at least 20% of the total investment of the project. The law does not stipulate management or majority rights for the SPE on this matter.				40% of the profits upon the award and the exploration or production licence. However, rules for state participation impose management independence on licensed entities. Article 6 (3) of the EU Directive 94/22/EC hydrocarbons directive limits any potential discrimination that might flow from state participation. This includes rules relating to the exercise of voting rights and the use of separate accounts. Any votes by the state participant must be based exclusively on transparent, objective, and non-discriminatory principles and should not prevent the entity's management decisions from being based on normal commercial principles. The state participant may, however, oppose a decision by licensees if it appears that such a decision does not respect the conditions in the licence regarding depletion policy and protection of the state's financial interests.	

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22	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016 Lineamientos que establecen parámetros para determinar la contraprestación por extracción comercial que el asignatario o contratista entregará a los propietarios cuando sus proyectos alcancen la extracción comercial de hidrocarburos. DOF: 16-03-2018.	Article 100 and 101, section VI, letter c	Exploration and extraction of hydrocarbons / Barrier to entry	Before starting production, contractors and assignees of exploration rights must agree to pay a percentage of the production revenue (minus deductions) to any landowners or holders (*titular de la tierra*) who will be affected by the production (e.g. because extraction facilities will be installed on their land). This percentage needs to be paid once exploration and extraction reach the level of commercial production. Production companies and land owners must negotiate the exact percentage, which needs to be between 0.5% and 3% for non-associated natural-gas projects, and between 0.5% and 2% for other hydrocarbon projects. Industry participants claim that in practice negotiations for non-associated natural-gas projects generally result in 3%. In Mexico, property owners or holders of land do not own any hydrocarbons that lie below it (unlike in the US). According to Article 1 of the Hydrocarbons Law, the Mexican nation "is the	SENER, CNH	A4	Until recently, contractors or SPEs and the property owner or holder had to negotiate the percentage of compensatory revenue. The negotiation process often delayed the start of operations for contractors and assignees. The legal situation changed on 18 March 2018 with the publication of guidelines that establish parameters to determine the compensation a assignee or contractor will give to the owners for the commercial extraction of hydrocarbons (Lineamientos que establecen parámetros para determinar la contraprestación por extracción comercial que el asignatario o contratista entregará a los propietarios cuando sus proyectos alcancen la extracción comercial de hidrocarburos). These include fixed percentages that depend on a project's	The objective is to compensate affected landowners or holders. **International comparison** In the Netherlands, the state owns all minerals situated 100 metres or more below the surface. Licences for exploration and production are granted through a process of competitive bidding with control through, among other means, state participation. Landowners have to tolerate any mining activity (including construction on their property) as long as a licence has been awarded and the activities take place 100 metres beneath the surface. Landowners should be properly compensated for any damage to their property (Article 4 M-Act). In Germany, resources can be explored without the consent of the individual landowner and the actual pattern of private land ownership. In the UK, permissions were required from the owner of land beneath which	No recommendation since the new guidelines already establish clear compensation percentages according to a project's projected profits.

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				holder of the direct, inalienable and imprescriptible ownership of all hydrocarbons present in the subsoil of the national territory". This means that the Mexican government licenses the extraction of gas from the ground. Gas companies do, however, have to pay a fee to the landowner to compensate for use of the land. The fee is not set by an authority, but the result of negotiations between gas company and property owner. SENER, with the assistance of the CNH, does elaborate methodologies, parameters and guidelines that can be used as a reference to calculate likely production and so the level of compensation.			projected profits. As such, a negotiated solution is no longer necessary and it appears that landowners no longer have the right to refuse the use of their land.	exploration was being undertaken until 2015. The Infrastructure Act of 2015, however provides a statutory right to use deep-level land (land with a depth of at least 300 metres below surface level) for petroleum and geothermal developments, subject to a modest payment to the landowner. Gas beneath the landmass of the UK or its territorial waters is owned by the Crown (i.e. the state). In the US, the landowner is also owner of the hydrocarbons and will directly contract the mineral companies for exploitation.	
23	Disposiciones Administrativas de Carácter General que establecen las reglas para el requerimiento mínimo de seguros a los Regulados que	General Administrative Provisions: 27, 28, 29 and 31	Exploration and extraction / Insurance	When private companies or SPEs perform exploration and extraction activities, they must take out insurance for an amount at least equal to that specified in the Disposiciones Administrativas de carácter general que establecen las reglas para el requerimiento	ASEA, CNH	A4	Several market participants have claimed that minimum amounts for insurance may be excessive. High costs might discourage entry into the market.	Most likely the objective is to guarantee an efficient response to any accidents related to exploration and extraction activities and avoid a situation in which the Mexican government might have to cover for damages. Even if there were no regulations	No recommendation.

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	lleven a cabo obras o actividades de exploración y extracción de hidrocarburos, tratamiento y refinación de petróleo y procesamiento de gas natural. DOF: 23-06-2016.			mínimo de seguros a los Regulados que lleven a cabo obras o actividades de exploración y extracción de hidrocarburos, tratamiento y refinación de petróleo y procesamiento de gas natural. For insurance covering liability and environmental damage the exact amount is set according to the type of activity. Generally, the insurance should cover, among other liabilities, maximum probable loss, emergency response, and mitigation and restoring activities. Companies must also contract protection for regaining control of an uncontrolled well, that is, a well that has suffered an unexpected release of formation fluid. This is also known as operator extra expenses (OEE) and insurance cover varies according to the level of drilling and investments for which the company or SPE is seeking permission. If private companies or SPEs use ships or mobile platforms, they must have protection and indemnity				mandating compulsory insurance, companies would still have to purchase similar insurance policies in order to receive financing and loans from third parties. International comparison In the UK, contracting OEE insurance is optional for companies; nevertheless, a large majority of companies exploiting and extracting natural gas choose to take it out in order to cover any possible liability issues (see, https://oilandgasuk.co.uk/wp-content/uploads/2015/04/Mandatory-Financial-Requirements-for-Oil-Industry-Operations-in-the-UKCS.pdf).	

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				(P&I) insurance that covers open-ended risks that traditional insurers are reluctant to cover, such as third-party risks caused by cargo, war risks, and environmental damage. New insurance amounts can be proposed based on the results of a probable maximum loss (PML) study. This study, which determines the amounts to be insured, must follow ASEA's guidelines and be carried out by an authorised third party.					
24	NOM-EM-005-ASEA-2017, Que establece los criterios para clasificar a los Residuos de Manejo Especial del Sector Hidrocarburos y determinar cuáles están sujetos a Plan de Manejo; el listado de los mismos, así como los elementos y procedimientos para la formulación de	Article 12	Non-accordance of standards	These NOM set the criteria for classifying special-use residuals in the hydrocarbons sector and for determining which are subject to a management plan. The NOM also contain a list of special-use residuals and provides procedures for setting up management plans for special-use residuals. It specifically states that it is not in line with international standards and that no international reference existed at the time of its writing.	ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in the case where Mexican standards have recently been (partially) adapted to international standards, if the NOM's legal text is not updated, there might be confusion among market participants.	In Mexico, non-harmonisation of NOM has to be disclosed, according to Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización, which states that NOM must state their degree of accordance with international norms and criteria.	Update the NOM so that it is as far as possible in accordance with international standards. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if no international standards or best practices currently exist.

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	los Planes de Manejo de Residuos Peligrosos y de Manejo Especial del Sector Hidrocarburos. DOF: 31-10-2017. Aviso por el que se prorroga por un plazo de seis meses contados a partir del 2 de mayo de 2018, la vigencia de la Norma Oficial Mexicana de Emergencia NOM-EM-005-ASEA-2017, Que establece los criterios para clasificar a los Residuos de Manejo Especial del Sector Hidrocarburos y determinar cuáles están sujetos a Plan de Manejo; el listado de los mismos, así como los elementos y								

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	procedimientos para la formulación de los Planes de Manejo de Residuos Peligrosos y de Manejo Especial del Sector Hidrocarburos, publicada el 31 de octubre de 2017.DOF: 18-04-2018.								
25	NOM-001-SEMARNAT-1996, que establece los límites máximos permisibles de contaminantes en las descargas de aguas residuales en aguas y bienes nacionales. DOF: 11-12-1996.	Article 7	Non-accordance of standards	NOM-001-SEMARNAT-1996 sets maximum legal limits for the discharge of pollutants into residual waters and national property (the latter managed by CONAGUA according to Article 113 of the National Water Law). The norm specifically states that it is not in line with international norms and that no international reference corresponding to the juridical and technical requisites of this NOM existed at the time of its writing.	SEMARNAT through CONAGUA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in the case where Mexican standards have recently been (partially) adapted to international standards, if the NOM's legal text is not updated, there might be confusion among market participants.	In Mexico, non-harmonisation of NOM has to be disclosed, according to Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización, which states that NOM must state their degree of accordance with international norms and criteria. According to the *National Standardisation Programme for 2018*, this NOM will be modified during 2018.	Update the NOM so that it is as far as possible in accordance with international standards. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if no international standards or best practices currently exist.

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26	NOM-003-CNA-1996, Requisitos durante la construcción de pozos de extracción de agua para prevenir la contaminación de acuíferos. DOF: 03-02-1997	Article 11	Non-accordance of standards	This NOM sets the minimum requirements to construct water extraction wells in order to prevent pollution of aquifers. The norm specifically states that it is not in line with international norms and that no international reference corresponding to the juridical and technical requisites of this NOM existed at the time of its writing.	CONAGUA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in the case where Mexican standards have recently been (partially) adapted to international standards, if the NOM's legal text is not updated, there might be confusion among market participants.	In Mexico, non-harmonisation of NOM has to be disclosed, according to Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización, which states that NOM must state their degree of accordance with international norms and criteria.	Update the NOM so that it is as far as possible in accordance with international standards. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if no international standards or best practices currently exist.
27	NOM-004-CNA-1996, Requisitos para la protección de acuíferos durante el mantenimiento y rehabilitación de pozos de extracción de agua y para el cierre de pozos en general. DOF: 08-08-1997	Article 10	Non accordance of standards	NOM-004-CNA-1996 sets the requirements to protect water-quality standards in aquifers during the maintenance, rehabilitation or closure of wells. It specifically states that it is partially in line with only two international norms (AWW C654 on water sanitation and A100 on closure of wells).	CONAGUA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in the case where Mexican standards have recently been (partially) adapted to international	In Mexico, non-harmonisation of NOM has to be disclosed, according to Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización, which states that NOM must state their degree of accordance with international norms and criteria.	Update the NOM so that it is as far as possible in accordance with international standards. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if no international standards or best practices currently exist.

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							standards, if the NOM's legal text is not updated, there might be confusion among market participants.		
28	NOM-011-CONAGUA-2015, Conservación del recurso agua - Que establece las especificaciones y el método para determinar la disponibilidad media anual de las aguas nacionales. DOF: 27-03-2015.	Article 5	Non-accordance of standards	NOM-011-CONAGUA-2015 sets the methodology for determining the average annual level of national surface and underground water. The norm specifically states that it is not in line with international norms.	CONAGUA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in the case where Mexican standards have recently been (partially) adapted to international standards, if the NOM's legal text is not updated, there might be confusion among market participants.	In Mexico, non-harmonisation of NOM has to be disclosed, according to Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización, which states that NOM must state their degree of accordance with international norms and criteria.	Update the NOM so that it is as far as possible in accordance with international standards. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if no international standards or best practices currently exist.
29	NOM-115-SEMARNAT-2003, Que establece las especificaciones de protección ambiental que deben observarse en las actividades	Article 6	Non-accordance of standards	NOM-115-SEMARNAT-2003 sets standards and preventive measures for the drilling or maintaining of oil wells in areas of agriculture, livestock farming or wasteland, and accompanying environmental protections. The norm specifically states	SEMARNAT through ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean	In Mexico, non-harmonisation of NOM has to be disclosed, according to Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización, which states that NOM must state their degree of accordance with	Update the NOM so that it is as far as possible in accordance with international standards. Some current practices may already be in accordance with international standards, which might ease the transition. It should be

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	de perforación y mantenimiento de pozos petroleros terrestres para exploración y producción en zonas agrícolas, ganaderas y eriales, fuera de áreas naturales protegidas o terrenos forestales. DOF: 27-08-2004.			that it is not in line with international norms and that no international reference corresponding to the juridical and technical requisites of this NOM existed at the time of its writing.			extra costs. Even in the case where Mexican standards have recently been (partially) adapted to international standards, if the NOM's legal text is not updated, there might be confusion among market participants.	international norms and criteria. According to the *National Standardisation Programme for 2018*, this NOM will be modified during 2018.	noted in the NOM if no international standards or best practices currently exist.
30	NOM-143-SEMARNAT-2003, Que establece las especificaciones ambientales para el manejo de agua congénita asociada a hidrocarburos. DOF: 03-03-2005.	Article 7	Non-accordance of standards	NOM-143-SEMARNAT-2003 sets standards for the handling and injection of connate water (water trapped within sedimentary rocks) in receptacle rock formations. This is important in fracking and other hydrocarbon extraction. The NOM also establishes maximum allowable standards for water discharges into this type of rock. The norm specifically states that it is not in line with international norms and that no international reference corresponding to the environmental and technical requisites of this NOM existed at the time of its writing.	SEMARNAT through ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in the case where Mexican standards have recently been (partially) adapted to international standards, if the NOM's legal text is not updated, there might be confusion among market participants.	In Mexico, non-harmonisation of NOM has to be disclosed, according to Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización, which states that NOM must state their degree of accordance with international norms and criteria. According to the *National Standardisation Programme for 2018*, this NOM will be modified during 2018.	Update the NOM so that it is as far as possible in accordance with international standards. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if no international standards or best practices currently exist.

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31	NOM-138-SEMARNAT/SSA1-2012, Límites máximos permisibles de hidrocarburos en suelos y lineamientos para el muestreo en la caracterización y especificaciones para la remediación. DOF: 10-09-2013.	Article 10	Non-accordance of standards	NOM-138-SEMARNAT/SSA1-2012 sets standards for maximum permissible levels of hydrocarbon solids and liquids in different types of soil and specifications for their remediation. The norm specifically states that it is not in line with international norms and that no international reference corresponding to the procedural and technical requisites of this NOM existed at the time of its writing.	SEMARNAT through ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in the case where Mexican standards have recently been (partially) adapted to international standards, if the NOM's legal text is not updated, there might be confusion among market participants.	In Mexico, non-harmonisation of NOM has to be disclosed, according to Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización, which states that NOM must state their degree of accordance with international norms and criteria. According to the *National Standardisation Programme for 2018*, this NOM will be cancelled and replaced by another during 2018.	Update the NOM so that it is as far as possible in accordance with international standards. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if no international standards or best practices currently exist.

Gas midstream restrictions

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1	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016	Article 96	Transport and distribution of natural gas / Building permits	CRE grants permits for the transport, storage and distribution of natural gas through pipelines. For building natural-gas pipelines, companies need to obtain a CRE permit *and* a construction permit from the relevant municipal authority. According to Article 115, letter V, point f of the Mexican Constitution, municipal governments have the power to issue building permits and licences. According to Article 96 of the Hydrocarbons Law, the federal government, state governments and municipalities must co-operate to promote procedures that grant permits and authorisations in matters of transport, storage and distribution through pipelines. According to market participants, municipal governments frequently deny or significantly delay construction permits to companies that already possess a federal CRE permit to transport natural gas through pipelines.	Municipal authorities, CRE	A2	The need to obtain municipal permits for infrastructure construction, delays or in some cases even prevents the development of natural-gas pipeline projects. Natural-gas companies cannot easily enter regional markets and compete with local LPG distributors.	The right of municipalities to grant construction permits is guaranteed in the Mexican Constitution. The General Deputy Directorate of Liaison with Municipalities and Trade Associations (Dirección General Adjunta de Vinculación con Municipios y Organismos Empresariales), a CRE department, is responsible for co-ordinating with municipalities, as well as establishing mechanisms for collaboration and information exchange with municipalities. Market participants, however, have frequently claimed that they are unaware of CRE's help when dealing with municipal authorities.	Introduce a department within a federal agency to facilitate business for natural-gas companies at a municipal level and provide that department with sufficient financial and human resources. This department would work within the limits of Article 115 of the Mexican Constitution and respect municipal autonomy in the authorisation of land use and issuance of construction permits. Its tasks might include: • offering models of permit applications (*modelos de solicitudes de permiso*) to municipal authorities; • signing collaboration agreements (*convenios de colaboración*) with municipal authorities or states; • advising applicants on how to best deal with municipal authorities; • publishing an annual report describing the situation for natural-gas

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									companies at the local level; • organising capacity-building workshops with municipal officials; and • acting as *amicus curiae* in court in cases where municipal permits are unduly denied. (Some of those tasks might be already performed by CRE or other federal agencies.)
2	N/A	N/A	Periodical compensatory payment / Municipalities	According to market participants, there is a misalignment of interests between municipal authorities and companies interested in developing natural-gas transport and distribution projects in municipalities (*municipios*). As municipalities do not currently receive any benefits from natural-gas companies building new natural-gas pipelines, they frequently do not support (and even hinder) such projects, which might lead to delays – and sometimes even to pipelines remaining unbuilt.	Municipal authorities	A4	Many natural-gas projects are delayed or even prevented at a municipal level. As a consequence, natural-gas distributors are often not able to compete with LPG distributors.	Mexican legislation does not deal with this misalignment of interests. **International Comparison** Several jurisdictions foresee some form of compensation to municipalities. For example, in Spain, municipalities are often compensated by gas companies in accordance with the municipal regulations (e.g. Natural gas companies give 1.5% of natural gas gross sales to the municipalities).	Study the possibility of granting municipalities incentitives to municipalities (e.g. regular payments as compensation for the use of community ground for natural gas sold in or transported across their territories or contributions in infrastructure payments).
3	Reglamento de la Ley General de Desarrollo Forestal Sustentable.	Bylaw: Articles 120 and 122 Law: Article	Infrastructure / Authorisation for the change of land use of	Natural-gas companies intending to build a pipeline have to change the land-use registration of the land on which the planned pipeline is to be built. Much of the land in question is currently registered	SEMARNAT through ASEA	A2	Construction of new natural-gas transport and distribution infrastructure is delayed whenever SEMARNAT does not issue a resolution	The objective of this restriction is to grant SEMARNAT control of how land in forestry zones is used. The Ley General de Desarrollo Forestal	Change the legislation so that if SEMARNAT, through ASEA, does not answer a request within the established time frame (and does not have a reason to "stop

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	Last reform: DOF, 31-10-2014 Ley General de Desarrollo Forestal Sustentable Last reform: DOF, 05-06-2018	14, section XI	forestry lands	as forestry at the Ministry of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales, SEMARNAT*). Companies interested in changing the land use of forests (*cambio de uso de suelo en terrenos forestales*) for their projects have to fill in a form issued by SEMARNAT and submit it to ASEA. Article 14, section XI of the General Law for Sustainable Forest Development (Ley General de Desarrollo Forestal Sustentable), issued in 2018, states that SEMARNAT has the power to issue authorisations to change the land use of forestry lands. Furthermore, Article 122 of the bylaw (Reglamento de la Ley General de Desarrollo Forestal Sustentable) issued on 21 February 2005, specifies that SEMARNAT has 60-75 work days to issue a resolution to change the forestry land use. If SEMARNAT does not issue a resolution within this time frame, the application is automatically rejected (*negativa ficta*).			within the agreed time frame, as applications are rejected by default (*negativa ficta*). According to industry participants, this happens frequently.	Sustentable was issued on 25 February 2003. A corresponding bylaw was issued on 21 February 2005 and last modified on 31 October 2014. This law was abolished and replaced by a new Ley General de Desarrollo Forestal Sustentable on 5 June 2018. This new law states in its second transitory article (which sets the legal framework for a transition period until new legislation comes into force) that from 5 June 2018, congress had 180 days to issue a new bylaw. Until then, the old law's bylaw remains in force. As of 18 September 2018, no new bylaw had been issued.	the clock", e.g. because an application is complete and does not include all required facts) an authorisation (instead of a rejection) will be granted by default (*afirmativa ficta*). This change would avoid project delays for new gas-pipeline projects. In cases where an authorisation granted by default leads to unforeseen negative (e.g. environmental) consequences, SEMARNAT should be able to challenge or withdraw the authorisation. Furthermore, ASEA might need to receive additional resources for fulfilling its task in time.

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4	Acuerdo por el que se emiten los Lineamientos y modelos de contratos para el uso, goce, afectación o, en su caso, adquisición de los terrenos, bienes o derechos para realizar las actividades de la exploración y extracción de hidrocarburos y de transporte por medio de ductos. DOF: 02-06-2016	Article 16	Maximum amounts / Compensation payment	Natural-gas companies intending to build a new pipeline have to agree a compensation payment with landowners or holders (*titular o propietario de la tierra*) for the use of their property. On 2 June 2016, SENER issued in the DOF the Agreement through which are issued the guidelines and contract templates for the use, enjoyment, impact or, where appropriate, acquisition of the land, assets or rights to carry out the activities of the exploration and extraction of hydrocarbons and transportation by means of pipelines (Acuerdo por el que se emiten los Lineamientos y modelos de contratos para el uso, goce, afectación o, en su caso, adquisición de los terrenos, bienes o derechos para realizar las actividades de la exploración y extracción de hidrocarburos y de transporte por medio de ductos), which contains general conditions and determines a minimum amount to be paid to the owner or holder for the use of the property. This agreement does not, however, foresee a maximum payment amount.	SENER	A4	Current Mexican legislation does not contain a maximum amount that gas companies have to pay landowners to use their property, as INDAABIN's valuation only serves as a reference. This lack of a maximum gives the landowner or holder strong bargaining power and the possibility of setting high prices and raising the cost of building natural-gas pipelines. Also, negotiations with landowners or holders may lead to delays in building the pipelines and restrict natural-gas companies wishing to enter regional markets and compete with local LPG distributors.	The objective of the provision is to ensure fair compensation for landowners or holders, while allowing gas companies to build pipelines without unnecessary delays.	Decisions about compensation for use of land for building of new natural gas pipelines should be made by government authorities. Compensation should be set by a federal authority and not be determined in bilateral negotiations between a gas company and a landowner or holder. When setting the amounts to be paid, the agency should take into account relevant factors such as average land prices in this area, as well as INDAABIN's valuations.

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				Current compensation payments are calculated according to a table published by the Institute of National Asset Management and Appraisal (Instituto de Administración y Avalúos de Bienes Nacionales, INDAABIN), a decentralised public agency of the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público, SHCP*) whose purpose is to administer and value federal and parastatal real-estate assets. INDAABIN uses a specific methodology to determine and issue scales on average land values for use or acquisition in hydrocarbon exploration and extraction projects (Metodología de los servicios valuatorios regulados por el Instituto de Administración y Avalúos de Bienes Nacionales para determinar y emitir tabuladores sobre valores promedio de la tierra para uso, ocupación o adquisición en proyectos de exploración y extracción de hidrocarburos, así como para la prestación del servicio público de transmisión y distribución de energía eléctrica y para la construcción de plantas de					

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				generación de energía eléctrica en aquellos casos en que, por las características del proyecto, se requiera de una ubicación específica).					
5	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016	Articles 105 and 117	Validation by a local judge / Compensation negotiation	Assignees or contractors (in this case, gas companies) negotiate agreements with owners or holders (*propietarios o titulares de la tierra*) of land (including community-owned land or *ejidos*) to establish compensation payments and conditions for the use of lands through which pass gas pipelines. Once negotiations have ended, a local judge (*juez de distrito en materia civil o tribunal unitario agrario*) must validate each contract before it enters into force.	Local judges	A4	A local judge has to validate numerous agreements as a prerequisite of new natural-gas pipelines being built. This might delay the construction of natural-gas pipelines and restrict natural-gas distributors' ability to compete with LPG distributors.	Guarantee that the rights of owners or holders of lands, goods or rights affected by the transport activities through pipelines are respected.	In addition to local judges, notaries should also be able to validate contracts between the owners or holders (*titulares de la tierra*) of land (including *ejidos*), goods or rights and assignees or contractors (in this case, gas companies).
6	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016	Article 69	New routes / Five-year plan	SENER periodically publishes a five-year expansion plan for SISTRANGAS, which contains a list of projects that SENER considers to be strategic for ensuring the efficient development of SISTRANGAS. For each of these "strategic projects", SENER must publish, among other data, the routes for the transport of natural gas. New routes are published before pipelines are built and even before the natural-gas company in charge has acquired all the land (or rights to use that land) that it will require for construction.	SENER	A4	Publishing the new routes for natural-gas transport pipelines in detail might generate land speculation, which could raise the cost of building pipelines, which in turn might affect final prices to consumers. Also, negotiations with landowners might delay new pipeline construction.	According to SENER's five-year plan, the objective of publishing expansion plans containing a list of projects is to allow mid-term planning of natural-gas transportation infrastructure and investment decisions.	No recommendation. Final pipeline routes are not sufficiently detailed to make it possible to acquire all the land in question. Therefore, it seems that in practice possibilities for land speculation are limited.

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7	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016 SENER and SEDATU's notification form.	Law: Articles 101, letter IV, and 117.	Negotiation notification / Double regulation	When a gas company interested in building new pipelines begins negotiations with the owners or holders of land (*titular de la tierra*) about compensation, it must notify SENER and SEDATU separately of each negotiation. Notifications are on a property-by-property (*predio por predio*) basis. Both SENER and SEDATU use their own notification forms, even though both demand similar data.	SENER, SEDATU	A2	The need to notify two authorities on a property-by-property basis and provide similar data twice generates unnecessary administrative burdens for companies and might unnecessarily delay projects.	The obligation to inform the authorities aims to guarantee individualised follow-up of all negotiations between companies and owners or holders of land, goods or rights necessary to the transport by pipelines of hydrocarbons (including natural gas).	Combine both notification templates, so that only one notification has to be submitted to either SENER or SEDATU.
8	NOM-003-ASEA-2016, Distribución de gas natural y gas licuado de petróleo por ductos. DOF: 18-08-2017	Point 5.5	Distribution of natural gas / Planning report	NOM-003-ASEA-2016 establishes the specifications and criteria for the design, construction, testing, inspection, operation, maintenance, closure and dismantling of the natural-gas and LPG pipeline distribution system. Point 5.5 of this NOM establishes that each time permit holders build new infrastructure, extend or modify their facilities, they must obtain a planning report (*dictamen de diseño*) from a verification unit (an accredited private natural person or company that performs conformity evaluation activities regarding NOMs) to check that the new or extended facilities or modifications were constructed according to NOM-003-ASEA-2016.	ASEA	A2	The wording of point 5.5 of this NOM implies that permit holders must obtain a new planning report for every modification to their facilities, no matter how minor. According to industry participants, however, in practice, the norm is applicable only for new pipelines. The text of the NOM might lead to uncertainty for industry participants as companies might assume that there exists an unnecessary notification requirement even for small modifications to pipelines.	Most likely, the objective of this restriction is to ensure quality standards for the expansion and modification of facilities for the distribution of natural gas.	Clarify in legislation that this provision is only applicable when building new pipelines.

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9	Directiva de información para las actividades reguladas en materia de gas natural DIR-GAS-006-2006. DOF: 08-01-2007 Disposiciones administrativas de carácter general que establecen los Lineamientos para informar la ocurrencia de incidentes y accidentes a la Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos. DOF: 04-11-2016	Directive 5.6 and 5.7	Security / Double regulation of incident reporting	CRE's directive DIR-GAS-006-2006 stipulates that natural-gas companies must notify CRE about any loss (*siniestro*) or incident that takes place. Companies must elaborate a detailed report on those incidents, as well as on the measures that were taken to control them. This report must be presented to CRE within ten working days following the date of the incident or loss. Companies also have to provide a similar report to ASEA, according to the ASEA regulation Disposiciones administrativas de carácter general que establecen los Lineamientos para informar la ocurrencia de incidentes y accidentes a la Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos. Incidents and accidents are classified as follows: 1) A Type 3 event is the most severe and can consist of, for example, two or more deaths on or off the premises, harm to premises, and operational disruption. 2) A Type 2 event might consist of one or more deaths on the premises. 3) A Type 1 event might consist of injuries that require medical leave and which occurred in the exercise or as a result of work tasks.	CRE, ASEA	A4	Companies have to send two similar report forms on accidents, losses (*siniestros*) and incidents to two different authorities. This creates additional costs for market participants.	Both CRE and ASEA are regulatory bodies in the energy sector, but the CRE directive DIR-GAS-006-2006 was issued before ASEA's creation. The current legal framework places ASEA as the authority in charge of overseeing the industrial and operative safety in the hydrocarbons sector while CRE supervises compliance of permit holders. CRE points out that it created, together with ASEA and CNH, the Oficina de Asistencia Coordinada del Sector Energético (ODAC), which aims to co-ordinate processes involving more than one energy regulator.	Regulated companies should only need to fill one form for reporting accidents. The OECD recommends allowing companies to provide a single report to ASEA and CRE. Ideally, this report should be uploaded to a common one-stop-shop platform (*ventanilla única*) after which the information could be shared by both agencies. The creation of the Oficina de Asistencia Coordinada del Sector Energético (ODAC is a first step in this direction.

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10	Resolución por la que la Comisión Reguladora de Energía expide las disposiciones administrativas de carácter general en materia de acceso abierto y prestación de los servicios de transporte por ducto y almacenamiento de gas natural. (RES/900/2015) DOF: 13-01-2016	Part 2, point 9.4 and 11.2	Natural gas / Barrier to entry	CRE grants permits for the transport and storage of natural gas. If a certain pipeline's capacity has already been allocated, a company needing capacity in that pipeline may request existing users transfer their unused capacity. Capacity holders may argue that releasing capacity would undermine the "economic feasibility" of their investment projects. The General Dispositions for Open Access and the Provision of Pipeline Transport and Storage Services (DACG en materia de acceso abierto y prestación de los servicios de transporte por ducto y almacenamiento de gas natural) RES/900/2015, states: "any new system, expansion or extension project classified as technically feasible is economically feasible provided that there is an interest in financing the development of the project."	CRE	A3	A lack of definition of "economic feasibility" might theoretically lead to difficulties in accessing transport and storage capacities if a capacity holder refuses to release capacities based on an unjustified evaluation that this would not be economically feasible. In 2016, CRE published RES/900/2015, which defined the term "economic feasibility". It strongly argues that its definition is sufficient and that there are no problems. Also, industry participants have not voiced problems with the current definition.	The government aims to guarantee access to capacity without endangering previous investment. The industry does not regard the lack of definition as a problem. International comparison Point 2.2. of Annex I of the Regulation (EC) No. 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural-gas transmission networks ("Congestion-management procedures in the event of contractual congestion") states: "In the event that contracted capacity goes unused, transmission-system operators shall make that capacity available on the primary market on an interruptible basis through contracts of differing duration, as long as that capacity is not offered by the relevant network user on the secondary market at a reasonable price" (known as "use it or lose it"). To the best of the OECD's knowledge, the provision does not contain an exception due to "economic feasibility".	No recommendation since industry participants do not consider the current definition as a problem.

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11	Acuerdo de la Comisión Reguladora de Energía que deja sin efectos la metodología para la determinación de los precios máximos de gas natural objeto de venta de primera mano, aprobada mediante la resolución RES/998/2015, y elimina el precio máximo de gas natural objeto de venta de primera mano para que se determine bajo condiciones de libre mercado. DOF: 16-06-2017. Resolución por la que la Comisión Reguladora de Energía	Agreement: Sixth Resolution: Clause 8.3.1	Risk of price coordination/ Natural-gas first-hand sales	First-hand sales (*ventas de primera mano*, VPM) are defined as the first transfer on Mexican soil of a hydrocarbon by a Mexican state productive enterprise (*empresa productiva del estado*, SPE) or a private company on behalf or at the behest of the state with or among third parties. As part of the asymmetrical regulation under which PEMEX is operating until markets are deemed competitive, the company must publish, through its "information system", a list of all contracts and transactions that PEMEX's subsidiaries have concluded between themselves for VPM of natural gas. PEMEX's information system must also contain information of the purchase-sale terms, prices and quantities of these contracts and transactions. This information system must be made available by PEMEX to potential buyers of VPM natural gas. According to PEMEX Industrial Transformation (PEMEX Transformación Industrial, PEMEX TRI), there is not yet a centralised electronic platform for publishing this information, even if the information is available at different locations on the PEMEX website.	CRE	B1, C2	The publication of the required information, which to PEMEX is strategic, could theoretically allow the company's competitors (i.e. natural-gas wholesalers) to co-ordinate their prices with those of PEMEX. Furthermore, PEMEX's incentives to offer discounts to targeted customers may be diminished, as its competitors would be able to observe those discounts and react to them within short time periods.	The "information system" seeks to prevent discriminatory offers between PEMEX subsidiaries and third-party buyers. The regulation is part of the asymmetrical regulation under which PEMEX will operate until markets are deemed competitive. According to CRE, this is not yet the case for all gas markets. To the best of the OECD's knowledge, CRE does not regularly publish reports about the status of markets in which PEMEX is subject to asymmetrical regulation. CRE claims that it is impossible to issue any fixed criteria (e.g. a market threshold under which PEMEX's market share must fall) that, if fulfilled, would lead to the asymmetrical regulation being lifted. Instead, it will be necessary to perform a case-by-case evaluation.	No recommendation, since it seems unlikely that the availability of PEMEX's information system could promote price co-ordination at the wholesale level. PEMEX's competitors have other ways to get information about prices. For instance, CRE publishes, as part of its National Reference Index for Natural Gas Wholesale Prices (Índice de Referencia Nacional de Precios de Gas Natural al Mayoreo, IPGN), an average monthly wholesale price for natural gas both nationally and in the six tariff zones (nine tariff zones from 1 October 2018). The OECD does recommend, however, that CRE publishes regular (e.g. annual) reports about the status of markets in which PEMEX is subject to asymmetrical regulation. In these reports, CRE should explain the criteria on which its

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	aprueba y expide los términos y condiciones generales para las ventas de primera mano de gas natural. DOF: 19-02-2016								evaluation is based for each market and the changes that still need to be made so that asymmetrical regulation can be lifted. The OECD generally supports asymmetrical regulations to introduce competitive conditions into markets that were formerly dominated by a monopoly. However, they must be based on clear criteria and verifiable data.
12	Directiva sobre la determinación del precio límite superior del gas licuado de petróleo objeto de venta de primera mano, DIR-GLP-001-2008. DOF: 01-12-2008. Acuerdo de la Comisión Reguladora de Energía que establece el criterio que deberán	General	Asymmetrical regulation / LPG first-hand sales	CRE introduced a methodology as part of the asymmetrical regulations that allowed PEMEX to compute maximum prices for LPG VPM. The formula used by PEMEX (and monitored by CRE) takes into account several factors, including the value of LPG at the relevant reference point (borders or ports where LPG can be imported or exported) in order to determine the price at each of PEMEX's processing facilities; the minimum transport cost to deliver LPG to each selling point; and infrastructure costs. Since 1 March 2017, LPG VPM prices have been computed weekly.	CRE	B1, C2	LPG VPM maximum prices could serve as a reference price that PEMEX and LPG importers could use to co-ordinate their prices at the wholesale level. According to PEMEX, LPG importers, which are its competitors in the LPG wholesale market, regularly sell at prices below regulated maximum prices. In order to remain competitive, PEMEX then has to sell at prices below these prices. If it raised prices, importers would	The regulation is part of the asymmetrical regulation under which PEMEX will operate until markets are deemed competitive. CRE states that not all markets are yet competitive. The objective of the provision is to create market conditions (in particular, prices) similar to those that would be exist under competition. With regulated LPG VPM prices, CRE also seeks to ensure efficient delivery of LPG to prevent undue price discrimination, as well as cross-subsidies. According to CRE, PEMEX still holds 50-70% of the LPG wholesale	The OECD recommends that CRE publish regular (e.g. annual) reports about the status of markets in which PEMEX is subject to asymmetrical regulation. In these reports, CRE should explain the criteria on which its evaluation is based for each market and the changes still needed for asymmetrical regulation to be lifted. The OECD generally supports asymmetrical regulations to introduce competitive conditions into markets that were

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	aplicar Petróleos Mexicanos, sus organismos subsidiarios o divisiones o cualquier otra persona controlada por estos, para la determinación de precios de venta de primera mano de gas licuado de petróleo a partir del 1° de enero de 2017. 20-12-2016 Resolución de la Comisión Reguladora de Energía que actualiza la periodicidad de las cotizaciones del precio del gas licuado de petróleo objeto de venta de primera mano a que se refiere la Directiva sobre						react and gain market share so any price increase would be unprofitable. Thus, price regulation would no longer be necessary. PEMEX claims that regulation of maximum prices make it slow to adapt to new market situations as it is forced to seek CRE approval for every new LPG VPM selling point before being able to apply it. PEMEX claims this can take CRE several months and so it is hindered from making timely competitive offers.	market and importers use much of their imported product themselves. The OECD has not been able to verify the CRE position. To the best of the OECD's knowledge, CRE does not regularly publish reports about the status of markets in which PEMEX is subject to asymmetrical regulation. CRE claims that it is impossible to issue any fixed criteria (e.g. a market threshold under which PEMEX's market share must fall) that, if fulfilled, would lead to the asymmetrical regulation being lifted. Instead, it will be necessary to perform a case-by-case evaluation.	formerly dominated by a monopoly. However, this must be based on clear criteria and verifiable data. For LPG VPM markets, the OECD notes that if PEMEX has to offer prices below the maximum price due to market conditions, as it claims, then maximum prices will not hinder its business activity. However, CRE does need to react to maximum-price applications from PEMEX as quickly as possible to allow PEMEX to react efficiently to market conditions. If necessary, new human resources dedicated to this task need to be added within CRE.

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	la determinación del precio límite superior del gas licuado de petróleo objeto de venta de primera mano DIR-GLP-001-2008. RES/180/2017.								
13	Resolución de la Comisión Reguladora de Energía que aprueba el modelo de comercialización de gas licuado de petróleo presentado por PEMEX Transformación Industrial. Resolución Núm. RES/1520/2017. 18-07-2017	Thirteenth template clause	Asymmetrical regulation / Termination of contracts	According to the third paragraph of the 13th transitory article of the Hydrocarbons Law, commercialisation activities (whether for LPG or natural gas) carried out by any PEMEX subsidiaries and trading, management, storage and distribution services are subject to asymmetrical regulation. In particular, commercialisation contracts that PEMEX subsidiaries can sign with buyers must be approved by CRE. CRE resolution RES/1520/2017 provides a template contract that PEMEX TRI can sign with buyers for the commercialisation of LPG. The 13th clause of this template – which PEMEX claims it is required to include by CRE – establishes that the contract can be terminated before the official end date by either party with at least 30 working days' notice.	CRE	B3	The mandatory clause diminishes PEMEX ability to plan long-term as customers are able to leave at short notice. The clause puts PEMEX TRI at a competitive disadvantage since its competitors holding comparable CRE permits to commercialise LPG can sign contracts with buyers without a similar termination clause.	The regulation is part of the asymmetrical regulation under which PEMEX will operate until markets are deemed competitive. CRE states that not all markets are yet competitive. The objective of the provision is to help PEMEX customers switch to other suppliers if they find a better offer. To the best of the OECD's knowledge, CRE does not regularly publish reports about the status of markets in which PEMEX is subject to asymmetrical regulation. CRE claims that it is impossible to issue any fixed criteria (e.g. a market threshold under which PEMEX's market share must fall) that, if fulfilled, would lead to the asymmetrical regulation being lifted. Instead, it will be necessary to perform a case-by-case evaluation.	The OECD recommends that CRE publish regular (e.g. annual) reports about the status of markets in which PEMEX is subject to asymmetrical regulation. In these reports, CRE should explain the criteria on which its evaluation is based for each market and the changes still needed for asymmetrical regulation to be lifted. The OECD generally supports asymmetrical regulations to introduce competitive conditions into markets that were formerly dominated by a monopoly. However, this must be based on clear criteria and verifiable data.

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14	Resolución por la que la Comisión Reguladora de Energía aprueba y expide los términos y condiciones generales para las ventas de primera mano de gas natural. DOF: 19-02-2016	Chapter I	Natural-gas first-hand sales / Discrimination	According to this provision, companies involved in natural-gas VPM must not undertake "undue discriminatory practices". To the best of the OECD's knowledge, PEMEX is the only SPE involved in natural-gas VPM. The Federal Economic Competition Law (Ley Federal de Competencia Económica) has a similar provision against anti-competitive discriminatory offers with prices or conditions to customers under equivalent conditions (i.e. Article 56, letter X).	CRE	A3	What "unduly discriminatory practices" means in the context of VPM is not clearly defined. This lack of clarity may favour discretionary behaviour from CRE when determining if a VPM is involved in unduly discriminatory practices. Furthermore, the provision might generate unnecessary administrative costs.	This provision allows CRE to monitor commercial practices, such as discriminatory pricing and discounts that could be anti-competitive, and forms part of a co-ordination scheme between CRE and COFECE. In particular, according to Article 81 of the Hydrocarbons Law, CRE must oversee the markets within its regulation to assess their performance in accordance to public energy policy. In addition to issuing and modifying regulation, CRE can inform SENER and COFECE of the results of its analyses. If CRE market monitoring detects an anticompetitive practice, the provision allows CRE to inform COFECE, which could then open an investigation.	No recommendation.
15	Directiva sobre la determinación del precio límite superior del gas licuado de petróleo objeto de venta de primera mano, DIR-GLP-001-2008.	Point 5.1	Asymmetrical regulation / LPG composition	CRE's directive DIR-GLP-001-2008 sets up a methodology for computing the maximum LPG VPM prices that PEMEX subsidiaries can charge. Point 5.1 of this directive establishes the composition of LPG used to compute LPG VPM maximum prices is 90% propane and 10% butane. According to Industrial Transformation (PEMEX Transformación Industrial,	CRE	B3	According to PEMEX, the rigidity of the LPG mixture in this directive prevents PEMEX TRI from profitably charging tariffs according to the different mixtures it produces A higher LPG quality differentiation would be possible if the directive	The objective of directive DIR-GLP-001-2008 is to establish a methodology for computing the maximum LPG VPM prices that PEMEX subsidiaries can charge, in order to limit PEMEX's dominance. CRE claims that a higher percentage of butane does not provide tangible advantages to Mexican consumers.	No recommendation. The directive does not impose a fixed proportion of butane and propane for the mixture of LPG. PEMEX subsidiaries are allowed to produce and sell any mixture of LPG, provided that it complies with NOM-016-CRE-2016.

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	DOF: 01-12-2008.			PEMEX TRI), a PEMEX subsidiary, the LPG VPM PEMEX produces consists of 60% propane and 40% butane, while the LPG sold by importers consists almost entirely of propane. Since butane is a more expensive product than propane, the mixture set in DIR-GLP-001-2008 would discriminate against PEMEX TRI. Also, PEMEX argues that the directive would make it more difficult for quality differentiations in the LPG wholesale market as it fixes the proportion of butane and propane NOM-016-CRE-2016 is a norm that deals with the quality specifications of oil and gas. Table 13 of that NOM states that an LPG mixture can consist of no less than 60% propane and no more than 40% butane. The directive allows PEMEX's subsidiaries to produce any mixture of LPG, including up to 100% of propane, as long as it complies with NOM-016-CRE-2016.PEMEX			allowed for different mixtures of propane and butane to elaborate LPG. However, the regulation in question does not limit PEMEX in its selling different compositions of propane and butane. It also does not limit PEMEX in adjusting the composition of its LPG. The formula only determines how the maximum price for those compositions is calculated and that a higher percentage of butane is not taken into account.	Furthermore, consumers cannot differentiate between the kind of mixtures they are buying.	
16	Disposiciones administrativas de carácter general que establecen los	Nineteenth recital of Terms and Conditio	Processing of natural gas / Discrimination against	SENER grants permits for natural-gas processing. The permit's terms and conditions stipulate permit holders must buy Mexican goods or contract	SENER	A3	The provision discriminates against foreign providers of goods and services that serve permit	The most likely objective is to support Mexican providers serving permit holders. Several other jurisdictions	The OECD recommends to the Mexican government to abolish the part of the provision related to the preference

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	modelos de los títulos de permisos en materia de tratamiento y refinación de petróleo, así como de procesamiento de gas natural. DOF: 19-11-2015 Acuerdo por el que se modifica el diverso por el que se establecen las disposiciones administrativas de carácter general que establecen los modelos de títulos de permisos en materia de tratamiento y refinación de petróleo, así como de procesamiento de gas natural. DOF: 29-01-2018	ns under Annex 2 Template of a permit for the refining of oil.	foreigners in (private) procurement	Mexican services, when Mexican and foreign providers offer the "equivalent conditions", such as similar prices, quality and delivery times. This regulation contains neither a definition of "equivalent conditions", nor further explanations about equivalence of prices, quality and timely delivery. It is therefore not clear how "equivalent conditions" are determined, since two offers will almost never be identical in terms of prices, quality and delivery.			holders in natural-gas processing. Foreign providers must offer better conditions than their Mexican counterparts in order to be chosen by permit holders. This can also prevent private companies from contracting with their preferred supplier. As it is unclear what the term "equivalent conditions" means, it is ambiguous as to when permit holders should contract a Mexican provider instead of a foreign provider.	have this type of provision to help the national economy.	for national staff or nationally produced goods under equal circumstances. A transition period could be foreseen to grant Mexican companies time to adapt to new market conditions. Alternatively, the Mexican Government should consider issuing guidelines in order to clarify how to determine when circumstances are equal in which case the preference for national products and labour should apply.

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17	Ley de Hidrocarburos. Last reform: DOF, 15-11-2016 Reglamento de las actividades a que se refiere el Título Tercero de la Ley de Hidrocarburos. DOF: 31-10-2014	Articles 81 and 82 Bylaw: Article 64	Transport and storage of natural gas / Lack of regulation	According to Articles 81 and 82 of the Hydrocarbons Law, CRE should issue, after co-ordinating with SENER, a methodology for setting tariffs for the Mexican integrated pipeline systems (i.e. interconnected systems of storage and transport by pipelines). According to industry participants, there is no specific regulation for the tariffs of integrated systems. Companies that transport natural gas require a permit from CRE. These permits have an annex called Terms and Conditions for the Provision of Services (Términos y Condiciones para la Prestación de los Servicios, TCPS) that establishes the tariffs, rights and obligations that permit holders must apply to their users. CRE approves the maximum tariffs that transporters can charge depending on the modalities of the services (e.g. constant service, interruptible service).	CRE	B1	The lack of a specific methodology regulating the setting of tariffs within integrated systems creates legal uncertainty for users of natural-gas transport capacity, as holders of permits to transport natural gas could theoretically set tariffs at their discretion (provided they are below maximum tariffs).	CRE is already working on establishing a methodology for setting the tariffs of integrated systems. It was foreseen that specific methodologies for all activities would be issued in 2018. (See p.10 of CRE's *Works Plan for 2017*, www.gob.mx/cms/uploads/attachment/file/197078/Programa_de_Trabajo_2017_CRE.pdf.) However, it appears that only the distribution methodology will be published in 2018; the remaining tariffs have been announced for 2019 or 2020. This methodology will be established through General Administrative Provisions (Disposiciones Administrativas de Carácter General, DACG). International Comparison In the EU, in principle, all users of a gas-transport system have an equal right of access. System operators shall provide system users with the information they need for efficient access to the system and refrain from discriminating between them. The 2009 EU Gas Directive provides for regulated third-party access to gas transmission and distribution systems. Access is based on	Establish specific regulations that provide users of natural-gas transport capacity with certainty about levels of transport tariffs. The tariffs, as well as their methodology, should be published and easily accessible.

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								published system tariffs and conditions are applied objectively and without discrimination between system users or classes of system users. Member states must ensure that these tariffs or at least the methodologies underlying their calculation are approved by the National Regulation Authority prior to their entry into force. **The Netherlands** The Netherland Gas Act differs between the national and regional grids. The national grid is operated by two state-owned transmission system operators (TSOs). This network is connected to gas production and storage facilities and then to regional grids that in turn supply gas to final consumers. The Gas Act provides for independent network operators with ownership unbundling seen as the best way to guarantee that they act independently. Network operators are responsible for the operation and the reliability of the grid. Network companies regularly have to submit quality plans to the regulator; these contain the reliability level the	

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								operators aim to achieve and their methods for doing so. Network operators are required to provide third parties with a connection to the network and carry out the transport. Gas transport is based on the principle of third-party access, which needs to be provided in a non-discriminatory and transparent way. The energy regulator approves the conditions for the transmission of gas by national and regional network operators on the basis of a proposal submitted jointly by the network operators and comments from representative organisations of network users. Each network operator will submit an individual tariff proposal each year. It is then up to the national energy regulator to make the final decision. The transportation tariff may differ for each network operator as the regulator takes into account the individual circumstances of each company, such as its revenues and efficiency and quality. **Germany** Like the Netherlands, access must be granted to everyone	

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								under objectively justified and non-discriminatory conditions. Access conditions and tariffs must be published online annually. Tariffs must be approved ex ante by the network regulator.	
18	Call for the 2016 open season (Convocatoria de Temporada Abierta 2016)	Recitals XX, XXI	Transport capacity of natural gas / Length of contracts	One of the ways in which companies can obtain transport capacity through the SISTRANGAS pipeline system, first is to get a transport permit from CRE, and then apply to CENAGAS, the authority that assigns capacity. The periods during which companies can apply to CENAGAS for capacity in SISTRANGAS are called "open seasons". The first took place 1 February 2017-31 January 2018. Companies had the possibility to renew or reserve capacities in a new procedure that took place from May to June 2018. As of September 2018, to the best of the OECD's knowledge, CENAGAS had no plans for an additional open season. According to CENAGAS, there are no time limits for the allocation of capacity and interested parties can apply for their chosen duration.	CENAGAS	A4	Companies are able to contract transport capacity from CENAGAS for long periods and may be able to foreclose the market as newcomers would not be able to transport their gas through SISTRANGAS pipelines.	The objective of this restriction is to create both flexibility and certainty by granting facilities to users that have already fulfilled the requirements to contract a determined natural-gas transport capacity. According to market participants, foreclosure of capacities has not been an issue in the Mexican market. CRE argues strongly against a maximum duration and points out that interested third parties would have various means to receive transport capacity (e.g. direct request to transport company, secondary market). **International Comparison** The EU generally applies long-term, take-or-pay contracts commonly ranging from 15 to 30 years between producers and EU purchasers with the contract's length matching the duration of the investment.	No recommendation. The duration of the contract should be evaluated on a case-by-case basis and depend on the specific project's investment capacity and needs. In the OECD's understanding, CENAGAS contracts cannot last longer than the length of the initial CRE permit to transport natural gas (30 years). Also, unused capacity cannot be withheld by the holder as third parties can request its release

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19	Ley Federal de Derechos. Last reform: DOF: 07-12-2016	Article 57	Natural-gas transport or storage / Barrier to entry	In order to transport or store natural gas, companies must apply for a CRE permit. CRE levies a fee for the evaluation of applications that companies must pay even if the permit is not granted. Fees depend on the type of permit: 1) MXN 399 032.64 for own-use transport for self-service companies; 2) MXN 656 406.06 for open-access transport; 3) MXN 325 248.64 for own-use transport; 4) MXN 4 408 146.92 for storage; and 5) MXN 171 563.78 for own-use storage. Holders of permits to transport or store natural gas must also pay an annual fee to CRE for permit surveillance: 1) MXN 239 620.21 for own-use transport for self-service companies; 2) MXN 471 097.31 for open-access transport; 3) MXN 185 092.25 for own-use transport; 4) MXN 631 852.39 for storage; 5) MXN 120 254.67 for own-use storage. If a permit title is modified and a technical, legal or financial analysis from CRE or any other federal government authority is required, a company must pay a fee of 50% of the original fee. Finally, CRE re-evaluates permit titles every five years. If	CRE	A2, A4	CRE uses surveillance fees, as well as fees for permit modifications, to collect revenue and finance itself. According to market participants, surveillance fees are not charged for actual work performed by CRE, but are a form of tax.	Surveillance fees aim to finance CRE by providing it with a steady income. They also provide CRE with a high degree of budgetary independence and autonomy from the government. According to Article 29 of the Ley de los Órganos Reguladores Coordinados en Materia Energética, in order to finance their total budget, CRE and CNH can access any income from the rights and fees (*derechos y aprovechamientos*) from the issuance and management of permits, authorisations, assignments and contracts, as well as from the activities and procedures that are in accordance with their attributions. According to CRE, the levels of these rights and fees have to be approved by the SHCP in accordance to a methodology that SHCP applies to the whole federal public administration.	No recommendation. The payment of annual surveillance fees does not discriminate between competitors and seems to be neutral to competition, since they are paid by all permit holders. Securing a steady income and financing CRE is a legitimate objective.

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				after an evaluation, CRE modifies a permit title, the permit holder must pay MXN 439 968.66 to CRE.					
20	Ley Federal de Derechos. Last reform: DOF, 07-12-2016	Article 58	LPG transport through pipelines / Barrier to entry	In order to transport LPG by pipelines, transport LPG for own-use or store LPG in plants, companies must apply for a CRE permit. CRE levies a fee for the evaluation of applications that companies must pay even if the permit is not granted. Fees vary according to the type of permit: 1) MXN 645 510.97 for transport through pipelines; 2) MXN 243 937.76 for transport through pipelines for own-use; 3) MXN 645 510.97 for storage in plants. Holders of permits to distribute through pipelines, transport or store LPG must pay an annual fee for permit surveillance: 1) MXN 471 097.31 for transport through pipelines; 2) MXN 185 092.25 for transport through pipelines for own-use; 3) MXN 631 830.61 for storage in plants. If a permit title is modified and a technical, legal or financial analysis from CRE or any other federal government authority is required, a company must pay a fee of 50% of the original fee.	CRE	A2, A4	CRE uses surveillance fees, as well as fees for modification of permits, to collect revenue and finance itself. According to market participants, surveillance fees are not charged for actual work performed by CRE but are a form of taxation.	Surveillance fees aim to finance CRE by providing it with a steady income. They also provide CRE with a high degree of budgetary independence and autonomy from the government. According to Article 29 of the Ley de los Órganos Reguladores Coordinados en Materia Energética, in order to finance their total budget, CRE and CNH can access any income from the rights and fees (*derechos y aprovechamientos*) from the issuance and management of permits, authorisations, assignments and contracts, as well as from the activities and procedures that are in accordance with their attributions. According to CRE, the levels of these rights and fees have to be approved by the SHCP in accordance to a methodology that SHCP applies to the whole federal public administration.	No recommendation. The payment of annual surveillance fees does not discriminate between competitors and seems to be neutral to competition, since they are paid by all permit holders. Securing a steady income and financing CRE is a legitimate objective.

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21	Lack of a unitary payment to transport natural gas across the Mexican territory.	N/A	Natural-gas transport / Tariff zones	SISTRANGAS extends across 21 Mexican states, and accounts for 10 068 kilometres of pipelines, divided into six tariff zones: Centre, Gulf, Isthmus, North, West, and South. Because of this division into tariff zones, companies wanting to transport natural gas across several zones frequently have to make several cumulative payments. For instance, to transport natural gas from the United States into Mexico City, it is necessary to make a payment for both the Gulf and Centre zones. Additional payments for using transport pipelines not belonging to SISTRANGAS might also be required. CRE resolution RES/1645/2018, issued on 30 July 2018 and coming into force on 1 October 2018, approved new distribution tariff zones proposed by CENAGAS. From that date, there will be nine zones.	CENAGAS	A5	The zoning of Mexican territory into six tariff zones requires a number of separate payments to transport natural gas across the country. This can make interstate trade more difficult.	CENAGAS calculates zonal transport tariffs and fees according to the distance over which gas was transported. Market participants have not complained about the tariff zones. International Comparison In the EU, a unified system within member countries means that companies wanting to transport gas through a country need to make only one payment. In addition, the European Gas Directive 2009 imposes upon all transmission system operators (TSOs) the obligation to co-operate through the European Network of Transmission System Operators for Gas (ENTSOG). Every two years, ENTSOG drafts network codes and adapts the existing community-wide ten-year network development plan, as well as implementing common network operation tools to ensure co-ordination of network operation in normal and emergency conditions.	No recommendation. An alternative method for calculating fees would be based on distance. However, the current situation does not limit competition or discriminate between participants. Generally, market participants have not complained.
22	NOM-027-SESH-2010, Administración de la integridad de ductos de recolección y transporte de	Chapter 13	Non-accordance of standards	NOM-027-SESH-2010 sets requirements to be fulfilled for the administration of pipelines for transportation of hydrocarbons and their derivatives.	SENER through ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be Mexican producers' access to foreign markets. In particular,	In Mexico, Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización states that NOM must state their degree of accordance with international norms and criteria.	Update the NOM so that it is in accordance with international standards as much as possible. Some current practices may already be in accordance with

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	hidrocarburos. DOF: 07-04-2010.			It specifically states that it is not in line with international norms.			producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards; if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	According to the *National Standardisation Programme for 2018*, this NOM will be modified during 2018 through the public enquiry of Proyecto de Norma Oficial Mexicana PROY-NOM-009-ASEA-2017, which is expected to be completed by December 2018.	international standards, which might ease the transition. It should be noted in the NOM if currently there are no existing international standards or best practices.
23	NOM-117-SEMARNAT-2006, Que establece las especificaciones de protección ambiental durante la instalación, mantenimiento mayor y abandono, de sistemas de conducción de hidrocarburos y petroquímicos en estado líquido y	Chapter 6	Non-accordance of standards	NOM-117-SEMARNAT-2006 establishes the environmental protection specifications for the installation, major maintenance and cessation of activity of systems for carrying hydrocarbons and petrochemicals in a liquid and gaseous state, over existing rights of way, located in agricultural, livestock and wasteland areas. It specifically states that it is not in line with international norms. It also states that no international reference existed at the time the NOM was written.	SEMARNAT through ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be Mexican producers' access to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not	In Mexico, Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización states that NOM must state their degree of accordance with international norms and criteria. According to the *National Standardisation Programme for 2018*, this NOM will be modified during 2018 after a public consultation for Proyecto de Norma Oficial Mexicana PROY-NOM-018-ASEA-2016, which is expected to be completed by December 2018.	Update the NOM so that it is in accordance with international standards as much as possible. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if currently there are no existing international standards or best practices.

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	gaseoso por ducto, que se realicen en derechos de vía existentes, ubicados en zonas agrícolas, ganaderas y eriales. DOF: 29-10-2009.						in compliance with international standards, there might be confusion among market participants.		
24	NOM-007-ASEA-2016, Transporte de gas natural, etano y gas asociado al carbón mineral por medio de ductos. DOF: 05-03-2018.	Chapter 14	Non-accordance of standards	NOM-007-ASEA-2016 sets the minimum requirements and technical specifications of industrial safety, operational safety and environmental protection, which must be met by those regulated companies for the design, construction, pre-start (pre-arranque), operation, maintenance, closing and dismantling of natural-gas, ethane and natural coal-gas transportation through pipelines. It specifically states that it is not in line with international norms.	ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be Mexican producers' access to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización states that NOM must state their degree of accordance with international norms and criteria. According to the National Standardisation Programme for 2018, this NOM will be modified during 2018 after a public consultation for Proyecto de Norma Oficial Mexicana PROY-NOM-007-ASEA-2016, which is expected to be completed by December 2018. According to ASEA, the NOM does take into account various international norms, but did not adopt all the standards due to there being no applicable international technical, legal and economic equivalences.	Update the NOM so that it is in accordance with international standards as much as possible. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if currently there are no existing international standards or best practices.

No.	Title of regulation	Article	Thematic category / Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
25	NOM-010-ASEA-2016, Gas Natural Comprimido (GNC). Requisitos mínimos de seguridad para Terminales de Carga y Terminales de Descarga de Módulos de almacenamiento transportables y Estaciones de Suministro de vehículos automotores. DOF: 23-08-2017.	Chapter 10	Non-accordance with international standards	NOM-010-ASEA-2016 sets the requirements and specifications for the design, construction, operation, maintenance and dismantling of loading and discharge terminals of compressed natural gas in transportable storage systems, as well as compressed natural-gas vehicle fuelling stations. It specifically states that it is not in line with international norms.	ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be Mexican producers' access to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización states that NOM must state their degree of accordance with international norms and criteria. According to ASEA, the NOM does take into account various international norms, but did not adopt all the standards due to there being no applicable international technical, juridical and economic equivalences.	Update the NOM so that it is in accordance with international standards as much as possible. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if currently there are no existing international standards or best practices.
26	NOM-015-SECRE-2013, Diseño, construcción, seguridad, operación y mantenimiento de sistemas de almacenamiento de gas licuado de petróleo	Article 10	Non-accordance with international standards	NOM-015-SECRE-2013 sets the minimum features, specifications, criteria and procedures to be met in the design, construction, safety, operation and maintenance of LPG storage systems. It specifically states that it is not in line with international norms.	ASEA	A5	Foreign competitors' access to the Mexican market may be hindered, as may be Mexican producers' access to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, which could mean extra costs.	There would appear to be no underlying objective behind the non-harmonisation of this NOM. In Mexico, Article 41, Letter VI of the Ley Federal Sobre Metrología y Normalización states that NOM must state their degree of accordance with international norms and criteria.	Update the NOM so that it is in accordance with international standards as much as possible. Some current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if currently there are no

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	mediante planta de depósito o planta de suministro que se encuentran directamente vinculados a los sistemas de transporte o distribución por ducto de gas licuado de petróleo, o que forman parte integral de las terminales terrestres o marítimas de importación de dicho producto. DOF: 12-12-2013.						Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	According to the National Standardisation Programme for 2018, this NOM will be modified during 2018 after a public consultation for Proyecto de Norma Oficial Mexicana PROY-NOM-007-ASEA-2016, which is expected to be completed by December 2018.	existing international standards or best practices.

Gas downstream restrictions

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
1	Municipal authorisation to use land to build LPG distribution plants.	---	LPG distribution / Land use	Companies wanting to distribute LPG through plants must apply for a permit from CRE and also obtain a land-use permit from municipal authorities. According to point d) of letter V of Article 115 of the Mexican Constitution, municipalities have the power to authorise, control and oversee the use of land within their competence. Municipal legislation on land use differs significantly between municipalities. While not a problem in some areas, in others, LPG operators face difficulties in accessing land for LPG-distribution plants.	CRE	A2	There is uncertainty as to whether companies with a CRE permit to distribute LPG through plants will be granted a municipal land-use permit and so be able to carry out their commercial activity.	The probable objective is to enable municipal governments to carry out urban planning, as well as to elaborate municipal development plans. This right of municipalities is guaranteed by Article 115 of the Mexican Constitution.	Create a department within a federal agency to facilitate business for LPG companies at a municipal level and provide the department with sufficient financial and human resources. This department would work within the limits of Article 115 of the Mexican Constitution and respect municipalities' autonomy in planning and land-use issues. Its tasks might include: • providing municipal authorities with models of permit applications (*modelos de solicitudes de permiso*); • signing collaboration agreements (*convenios de colaboración*) with municipal authorities or states; • advising applicants on how to best deal with municipal authorities; • publishing an annual report describing the situation for LPG companies at local level; • holding capacity-building workshops with municipal officials; and • acting as amicus curiae in court in cases where municipal permits have been unduly denied.

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									(Some of these tasks might be already performed by CRE or other federal agencies.) For LPG-distribution plants, this department could offer models of land-use permit applications and hold capacity-building workshops.
2	Reglamento de las actividades a que se refiere el título tercero de la Ley de Hidrocarburos. DOF: 31-10-2014 NOM-002-SESH-2009, Bodegas de distribución de Gas L.P. Diseño, construcción, operación y condiciones de seguridad. DOF: 20-05-2009.	Bylaw: Article 2, section III; and 41. NOM-002-SESH-2009: General	Permits / Alternative channels to sell LPG	Retailers have difficulties in selling LPG cylinders often due to complications in obtaining municipal permits. Currently, LPG cylinders in Mexico are mainly sold by distributors. Very few retailers, such as supermarkets or service stations, are active in the market selling LPG cylinders to end consumers from their premises. Mexican regulation allows the sale of "portable cylinders" (*cilindros portátiles*) at service stations and retail stores as an alternative to traditional distributors selling LPG from tanker trucks and cylinder delivery trucks. Portable cylinders are cylinders with a total weight (i.e. cylinder weight plus weight of LPG) of less than 25 kg,	CRE	A2	The federal permit does not seem to hinder market entry by retailers. However, the lack of clear criteria for the granting of municipal permits appears to make the sale of portable cylinders at retail stores and service stations more difficult. The lack of additional suppliers, especially retail stores and gas stations, deprives consumers of greater diversity and better prices. According to COFECE's 2018 report *The Transition to Competitive Energy Markets: LPG* (p. 55), the entry of an additional competitor into regional LPG markets	Municipal permits most likely aim to ensure retail storage facilities selling LPG cylinders are safe. According to points d) and f) of letter V of Article 115 of the Mexican Constitution, municipalities have the power to authorise, control and oversee the use of land, within their competence, as well as to issue construction licenses. Since 2008, a small number of retail stores and service stations have started selling cylinders. However, until December 2016, the price for LPG sold to final consumers was regulated at the federal level and, according to market participants, margins	The OECD recommends establishing a department within a federal agency to facilitate business for LPG companies at a municipal level, as described above. For retail storage facilities selling LPG cylinders (*bodegas de expendio*), the department could also offer model permit applications to municipalities. If the OECD recommendation to increase the number of LPG distributors (especially supermarkets and gas stations) is fully implemented, and thus more supermarkets and large gas stations would be able to sell portable cylinders, the benefit to consumers is estimated to be between MXN 787.1 million and MXN 1 338.8 million. This calculation is explained in detail in Annex 2.A.

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				containing less than 10 kg of LPG. In order to sell portable cylinders at service stations and retail stores, companies need both a federal permit from CRE and municipal permits from local authorities. The federal CRE permit is known as LPG sales to the public through retail storage facilities (Expendio al público de GLP mediante bodegas de expendio). In addition, retail stores must comply with several safety criteria contained in the federal NOM-002-SESH-2009. Finally, municipal permits are typically required for the building of facilities or for the refurbishing of premises. According to market participants, the requirements of the federal CRE permit are clear, and CRE provides timely guidance to potential applicants. Municipal permits, however, are often difficult to obtain as requirements can vary across municipal authorities and must be			could exert additional competitive pressure on incumbent distributors and lead to a significant price reductions – up to 6.56% for regions where only one distributor is present.	were not sufficient to attract new market entrants. CRE is not responsible for municipal permits. However, its General Deputy Directorate of Liaison with Municipalities and Trade Associations (Dirección General Adjunta de Vinculación con Municipios y Organismos Empresariales) and the General Deputy Directorate of Liaison with States (Dirección General Adjunta de Vinculación con Estados) are in contact with state and municipal authorities.	

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				obtained on an establishment-by-establishment basis (i.e. individually for each store or service station). According to CRE's website listing all current permits for LPG-related activities (http://organodegobierno.cre.gob.mx/permisosglp.aspx), as of 26 August 2018, there were only 13 permits for sales to the public through retail storage facilities.					
3	Reglamento de las actividades a que se refiere el Título Tercero de la Ley de Hidrocarburos. DOF: 31-10-2014	Article 11	LPG permits / Administrative burden	The following LPG-related activities require a permit: treatment and refining of oil; imports of LPG; transport, storage, distribution, commercialisation and sales to the public. The requirements for these permits are established in Articles 50 and 51 of the Hydrocarbons Law Application forms for a number of these CRE LPG permits can be accessed at: www.gob.mx/cre/articulos/formatos-de-solicitudes-de-permiso-en-materia-de-gas-licuado-de-petroleo.	SENER, CRE	A2, B4	None of the relevant permits confer exclusivity rights or foreclose other participants beside the applicant from the market. The duration of the permits, however, might pose a competition concern as, due to the lack of guidelines, authorities could theoretically discriminate between applicants, within a given activity, granting permits with different durations to different applicants. A	The objective of the requirement is to ensure that permit holders fulfil all requirements necessary to carrying out correctly the activities in question. The duration of each permit should depend on when it seems reasonable to re-evaluate whether all requirements are still being fulfilled.	To give market participants more transparency, CRE should issue guidelines for determining the duration of LPG-related permits depending on the specific activity.

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				All these permits, with the exception of SENER permits to import LPG, can be granted for up to 30 years, and extended once for up to half of their original duration. In total, each CRE permit can therefore be valid for a total of up to 45 years. According to CRE, the same type of permits are granted for the same duration for all permit applicants and no discrimination takes place. As guidelines do not exist, however, it would theoretically be possible for CRE and SENER to grant permits with different durations to different applicants for the same activity.			competitor having to renew a permit with a shorter duration would have to bear additional costs in comparison to a competitor holding a permit with a longer duration. However, it seems that in practice no discrimination between competitors has taken or is taking place.		
4	Reglamento de las actividades a que se refiere el Título Tercero de la Ley de Hidrocarburos. DOF: 31-10-2014 Resolución por la que la Comisión	Bylaw: Article 45	Permits / Barrier to entry	Transport, storage, distribution and retail of LPG require a CRE permit (among other permits). To obtain one, interested companies must complete an application proving that they comply with the conditions of Articles 50 and 51 of the Hydrocarbons Law. These requirements include	CRE	A2	Market entry of new participants could be delayed, especially if, as claimed by some market participants, CRE takes too long to issues permits and extends the official deadlines. Participants are kept out of the market until they obtain a permit	To ensure that permit applications are complete so that CRE can take its decisions based on all the relevant facts. CRE has been working on reducing its timeframes to analyse permit applications for natural gas and LPG.	CRE should publish an annual report with statistics on the average time taken to issue different permits, as well as how often additional information was required. Moreover, explanations should be provided for the cases where CRE does not meet its own deadlines. The OECD encourages CRE to pursue its efforts in reducing the time frame for issuing permits.

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	Reguladora de Energía expide las disposiciones administrativas de carácter general que establecen las especificaciones de los requisitos a que se refieren los artículos 50 y 51 de la Ley de Hidrocarburos, los formatos de solicitudes de permiso y los modelos de los títulos de permisos para realizar las actividades de almacenamiento, transporte, distribución y expendio al público de gas licuado de petróleo. DOF: 15-12-2015 Acuerdo de la Comisión Reguladora de Energía por el que se			providing proof of insurance, projects' technical specifications, and the required investment. More detailed requirements for the granting of specific permits are set out in the General Administrative Provisions (Disposiciones Administrativas de Carácter General, DACG). In the case of applications for the permits to store, transport, distribute and retail LPG to the public, the requirements were published in a DACG in the DOF on 15 December 2015. CRE has 90 working days after receiving an application to decide whether to grant or refuse a permit. During the first 30 working days, CRE can notify the applicant about its application being incomplete and the applicant can correct any omission or deficiency in the information or documentation initially provided. In that case, the time limit for issuing the resolution is suspended			from CRE. It is difficult to assess the veracity of this claim and CRE denies it. However, CRE does not publish information about the percentage of applications not managed within the mandated timeframe.		

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	modifican los plazos de resolución de diversos trámites relativos a las actividades reguladas. DOF: 18-06-2018			and will only resume the working day following the applicant providing the missing information. Participants in the LPG distribution market claim that CRE frequently notifies permit applicants that their applications are incomplete even when (at least, according to the market participants) they are not. Requesting additional information, it is claimed, is used as a pretext to prolong CRE's working time. In practice, according to market participants, CRE has been known to extend the time taken to issue a permit to up to 300 days. CRE refutes this accusation and claims that it never asks for additional information if it is not required. It also claims that it almost never goes over the 90 days to issue a permit and that the average time it takes to issue LPG-related permits is 59 working days. Its ability to respond to applications depends on its human resources. CRE did not provide information about					

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				the frequency with which it fails to issue permits within the timeframe required. CRE stresses that, through DOF agreements A/082/2017 and A/021/2018, it has reduced the time it is allowed to analyse certain LPG-related permits from 90 to 78 working days, for the following permits: 1) commercialisation of LPG and propane; 2) distribution of LPG through plants; 3) LPG retail through service stations for own consumption; 4) LPG retail through retail storage facilities; 5) LPG retail through specific service stations; 6) LPG transport through means other than pipelines; and 7) LPG distribution through tanker trucks.					
5	Trámite CRE-18-002-A Aumento o disminución de parque vehicular	---	Authorisation / Barrier to entry	If a company holding a CRE permit to distribute LPG through plants decides to acquire new vehicles (i.e. new tanker trucks or cylinder-delivery trucks), it has to submit a request to CRE to update the permit title (issued as an authorisation). This	CRE	A2	Companies that hold permits to distribute LPG through plants cannot immediately use the newly acquired vehicles (tanker trucks and delivery trucks). According to market participants,	Ensure that the new vehicles (i.e. tanker trucks and delivery trucks) acquired by LPG distributors are adequate to carry out their activity. CRE argues that simply notifying it of the acquisition of new	The OECD recommends that companies holding permits to distribute LPG through plants should only have to notify CRE of the acquisition of new vehicles. As part of that notification, companies would need to confirm that they comply with NOM-007-SESH-2010, as well as provide a vehicle's insurance policy.

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				procedure is identified under code (*homoclave*) CRE-18-002-A (see, http://187.191.71.208/BuscadorTramites/fichasnew/CRE-18-002-A.pdf). Its official name is "update of the LPG permit" (*actualización de permiso en materia de GLP*), but it is also known as "increase or decrease of the vehicle fleet" (*aumento o disminución de parque vehicular*). Companies are not allowed to use new vehicles before CRE has authorised the updated permit. Once the authorisation is issued, CRE registers the vehicles. In order to authorise permit updates, CRE asks permit holders to provide proof of damage insurance for the vehicles and a technical report (*dictamen técnico*) proving the new vehicles' compliance with NOM-007-SESH-2010, Vehículos para el transporte y distribución de Gas L.P.– Condiciones de seguridad, operación y mantenimiento (this NOM			applicants in practice often do not wait for the authorisation and use new vehicles directly after buying them, so infringing the provision.	vehicles would go against Article 51, letter I of the Hydrocarbons Law that states the granting of CRE permits is subject to applicants showing that the design of premises or equipment complies with current legislation, as well as best practices. The OECD, however, considers that only requiring a notification of newly acquired vehicles would not infringe the article. Companies would still need to fulfil all legal requirements and CRE would be able to confirm compliance with spot checks.	

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				will be modified, and the draft modification is known as ANTE-PROY-NOM-022-ASEA-2018). CRE's maximum time to issue an updated authorisation of permit titles is 90 working days. CRE recently decided to reduce this to 80 calendar days through agreement A/021/2018 published in the DOF on 18 June 2018. Furthermore, CRE states that it is working on an electronic platform that should simplify the procedure and reduce by as much as two thirds the current time required to issue an authorisation.					
6	Lack of regulation for the exchange of cylinders among LPG distributors.	--	LPG distribution / Lack of regulation	In Mexico, there are currently two types of LPG cylinders: 1) those branded by LPG distributors; and 2) generic unbranded cylinders. Branded cylinders can only be filled by the distributor that branded them, while generic cylinders can be filled by any LPG distributor. Branded cylinders can be exchanged between distributors (e.g. distributor	SENER	D2	The lack of regulation on cylinder exchange among distributors could favour customer lock-in. For example, a customer who bought a cylinder from distributor A might have difficulty in exchanging the empty cylinder if no distributor other than A accepts the cylinder for	Authorities in Mexico have not yet decided on which model to follow. CRE is currently working on a new regulation to address this issue. Indeed, in CRE's *Work Programme for 2017*, (www.gob.mx/cms/uploads/attachment/file/197078/Programa_de_Trabajo_2017_CRE.pdf), it is stated that	The OECD suggests issuing regulations that deal with: • the exchange of branded cylinders; • standard deposits for exchanges; • the creation of cylinder-exchange centres; • obliging distributors of branded cylinders to accept competitors' branded cylinders; and • preventing distributors of branded cylinders from holding competitors' cylinders.

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				A could deliver a new branded cylinder to a customer and, in exchange, accept the empty cylinder of distributor B). However, there is no regulation determining the terms of cylinder exchange between LPG distributors. In practice, it has been up to distributors to decide whether they accept competitors' cylinders. Article 4.2.4.2 of SENER's directive DIR-DGGLP-001-2011, para la prestación de servicios de Distribución a Usuarios Finales y de Supresión de Fugas de Gas L.P. only establishes that if a customer has an empty cylinder from a distributor of brand A and now wants to buy a cylinder from a distributor of brand B, he or she can ask a delivery truck from distributor of brand B to take the brand A cylinder. If the brand B distributor accepts the brand A cylinder, it must return the deposit the customer paid for the cylinder of brand A. The distributor of brand B			exchange. The customer would therefore be more likely repurchase gas from distributor A to avoid paying several deposits.	CRE will design regulation for the exchange of cylinders among LPG distributors to define a regulatory regime that identifies distributors' LPG cylinders. One of that regulation's objectives is to make LPG-industry participants accountable for accidents, damage and non-compliance caused by cylinders. CRE has stated that it is preparing General Administrative Provisions (Disposiciones Administrativas de Carácter General) for a cylinder-exchange programme. This programme aims to switch from the current dual regime of branded and non-branded cylinders to a branded-only system. For that, CRE has studied the international experience of 11 countries and come to	The OECD does not make a recommendation, in either direction, concerning the question whether a branded or a generic system is preferable – as this seems to be a security, not a competition issue. However, in case of the Mexican authorities deciding in favour of a branded cylinder system, the OECD recommends to introduce a transition period and not impose unnecessarily high costs on small distributors currently operating with unbranded cylinders.

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				will then recover the deposit upon returning the empty cylinder to the brand A. Directive DIR-DGGLP-001-2011, however, does not oblige LPG distributors to accept competitors' cylinder nor does it contain any provision setting the terms of cylinder exchange between distributors or the amounts of refundable deposits. There are two general approaches to the regulation of cylinders: 1) have only branded cylinders in the market to preserve distributors' incentives to invest in cylinder renewal and regularly exchange old cylinders for new ones, as well as to guarantee distributors' accountability following accidents; 2) continue with the coexistence of generic and branded cylinders because if all cylinders were branded, market participants using generic cylinders that cannot afford to brand cylinders (mostly small distributors) would, it is argued, have to				the conclusion that a branded system would be the best solution in terms of quality, safety, and consumer protection. CRE foresees the possibility of distributors exchanging cylinders between themselves and allowing consumers to switch providers easily, thus preventing the lock-in anti-competitive effects that branded cylinders could create. Lock-in effects should be avoided. During interviews with the OECD, CRE claimed that its analysis found that costs for newcomers would be more or less equivalent whether they began operating with generic or permanently branded cylinders. This is in contrast to small market participants that claim a proprietorial cylinder regime might push	

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				exit the market. Potential entrants would also have difficulties entering the market.				them out of the market. **International comparison** In its 2013 *Guidelines for the Development of Sustainable LP Gas Markets. Early-Stage MarketsEdition* (p.39), the World Liquified Petroleum Gas Association (WLPGA) supported a model of branded cylinders and recommended that national governments do not allow distributors to accept competitors' cylinders from customers. However, if cross-brand exchanges do exist, the WLPGA suggests that governments issue regulations to prevent any LPG distributor from holding back from the market any of its competitors' cylinders that it might have obtained through customer exchanges. This practice is known as "competitive cylinder hoarding".	

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7	NOM-EM-004-ASEA-2017, Especificaciones y requisitos en materia de seguridad industrial, seguridad operativa y protección al medio ambiente para el diseño, construcción, pre-arranque, operación, mantenimiento, cierre y desmantelamiento de estaciones de servicio con fin específico para el expendio al público de gas licuado de petróleo, por medio del llenado parcial o total de recipientes portátiles a presión. DOF: 08-08-2017. AVISO por el que se prorroga	General	LPG distribution / Safety rules	LPG service stations need a permit from CRE to serve consumers; these are granted for up to 30 years. This permit is known as "retail through specialised service stations" (*expendio al público de GLP mediante estación de servicio con fin específico*). As of 23 August 2018, there were 3 294 permit holders (see, www.gob.mx/cms/uploads/attachment/file/380156/Estad_stica_b_sica_GLP.PDF). In August 2017, ASEA issued an emergency NOM that established the requirements and minimum specifications for industrial and operative safety for the total or partial refilling of portable pressurised cylinders at LPG service stations. Existing LPG service stations that want to refill portable cylinders need to obtain the CRE permit known as "retail of LPG through the partial or total filling of portable pressurised containers" (*expendio al público de*	ASEA	A2, A3	According to market participants, some of the NOM requirements are strict and complying with them would lead to excessive costs for LPG service stations. For instance, according to point 5.4.1.b.2. of the NOM, service stations' LPG-storage containers (*recipientes de almacenamiento*) must be new; this leads to high costs for service stations that want to comply with the NOM as they have to purchase new storage containers instead of using their existing ones. Market participants argue that such excessive requirements incentivise the illegal total or partial filling of cylinders at LPG service stations and that companies complying with this NOM would be	Ensure that LPG service stations fill portable cylinders under safe conditions. The current NOM on *picteleo* (NOM-EM-004-ASEA-2017) is not permanent and ASEA is currently working on a definite version. The draft is known as ANTE-PROY-NOM-008-ASEA-2017 and is being written with a multidisciplinary working group that is identifying and assessing international standards.	Reassess safety conditions, taking into account international standards for NOM-008-ASEA-2017. In order to prevent illegal practices, introduce fines to guarantee that service stations that fill cylinders comply with the NOM. The OECD encourages ASEA to continue its ongoing work on revising the NOM.

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	por un plazo de seis meses contados a partir del 10 de febrero de 2018, la vigencia de la Norma Oficial Mexicana de Emergencia NOM-EM-004-ASEA-2017, Especificaciones y requisitos en materia de seguridad industrial, seguridad operativa y protección al medio ambiente para el diseño, construcción, pre-arranque, operación, mantenimiento, cierre y desmantelamiento de estaciones de servicio con fin específico para el expendio al público de gas licuado de			*GLP por medio del llenado parcial o total de recipientes portátiles a presión*). A requirement for obtaining a CRE permit is first to comply with ASEA's NOM. Prior to the issuance of ASEA's NOM, this area was unregulated, although LPG service stations had commonly been carrying out the total or partial filling of cylinders. The practice, known as *picteleo*, is a long-standing practice in Mexico, since many low-income households cannot afford to buy full cylinders. According to CRE, as of 21 August 2018, not a single service station in the entire country has complied with ASEA's NOM; consequently, no LPG service station has obtained the CRE permit to retail LPG through the partial or total filling by pressure of portable containers.			seriously disadvantaged in comparison to competitors ignoring it, so much so that compliance would not allow them to compete and could force them out of the market.		

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	petróleo, por medio del llenado parcial o total de recipientes portátiles a presión, publicada el 8 de agosto de 2017. DOF: 08-02-2018.								
8	NOM-011/1-SEDG-1999, Condiciones de seguridad de los recipientes portátiles para contener Gas L.P. en uso. DOF: 03-03-2000	Number 4.4.1 and 4.4.2	LPG distribution / Discriminatory standard	This NOM sets minimum safety conditions for portable containers (i.e. cylinders weighing less than 25 kg) in which LPG is distributed. It contains specifications for marking these cylinders so their distributors are traceable. Companies must visually inspect every cylinder before it is filled with LPG and cylinders with possible dents, incisions, holes or corrosion should no longer be used. The NOM foresees that for distribution storage facilities where, on average, fewer than 1 000 cylinders are filled a day, 10% of cylinders must be checked daily by the distributor for possible dents, incisions, cavities	SENER	B3	The provision's difference in the number of cylinder inspections discriminates against storage facilities filling more than 2 000 cylinders a day. For instance, if at storage facility A, 950 cylinders are filled a day, 95 cylinders (10%) would have to be inspected. If at storage facility B, 1050 cylinders are filled a day, 200 cylinders would have to be inspected (19.05%). It would therefore be significantly more costly for storage facility B to comply with the inspection	To ensure that LPG cylinders do not constitute a danger to the persons who handle them.	Introduce an inspection system that is more gradual in the percentages of cylinders needing to be inspected. For instance, a system could be introduced that requires a storage facility where fewer than 2 000 cylinders are filled a day to inspect 10%, while for facilities where more than 2 000 cylinders are filled a day, a total of 200 (or a certain percentage below 10%) should be inspected.

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				and corrosion. Damaged cylinders should no longer be used. For distribution storage facilities where, on average, more than 1 000 cylinders are filled a day, 200 cylinders must be inspected daily.			requirement. It is not clear why a higher number of cylinders filled requires a higher percentage of inspections.		
9	NOM-002-SCFI-2011, Productos preenvasados-Contenido neto-Tolerancias y métodos de verificación. DOF: 10-08-2012	(General)	LPG distribution / Net content of cylinders	NOM-002-SCFI-2011 deals with the verification of the net content of pre-bottled products. It applies to LPG cylinders' net content, as well as many different products, such as soft-drink bottles. There is no specific PROFECO NOM on how to verify the content of LPG cylinders.	PROFECO	B4	The lack of a specific NOM for LPG cylinders could leave PROFECO too much discretion when verifying the content of cylinders and might potentially put some LPG distributors at a disadvantage, e.g. if PROFECO uses its wide discretion and favours one distributor over another in spite of similar situations.	The NOM seeks to guarantee that customers of pre-bottled products receive the net content for which they have paid.	The OECD recommends the issuance of a NOM that deals with the verification of the net content of LPG cylinders specifically. It should take account of existing international standards, in order not to generate barriers to entry.
10	NOM-002-SESH-2009, Bodegas de distribución de Gas L.P. Diseño, construcción, operación y condiciones de seguridad.	Number 4.2	LPG distribution / Excessive measure	Currently, direct sales of portable cylinders to end consumers are only allowed from small storage facilities or *bodegas de distribución* (i.e. subtype A distribution storage facilities), not from large distribution storage facilities.	SENER	A3, A4, B3	Since direct sales to end customers cannot take place at distribution storage facilities with high capacities (subtypes C and D), LPG distributors cannot achieve economies of scale. To sell directly to end customers,	The objective of NOM-002-SESH-2009 is to establish the minimum technical safety specifications that must be fulfilled in the design, construction and operation of LPG storage distribution facilities (*bodegas de*	No recommendation.

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	DOF: 20-05-2009.			NOM-002-SESH-2009 defines LPG storage distribution facilities as establishments for distributing LPG through portable (*portátiles*) or transportable (*transportables*) containers (i.e. cylinders), whether through direct selling to end users, dispatch to end users (*envío a usuarios finales*) or redispatch to other storage facilities (e.g. retail storage facilities). Transportable containers are filled with LPG, and have safety, weight and dimension characteristics that allow them to be handled by trained staff. Portable containers can be handled manually by end users and their total weight is less than 25 kg (containing up to 10 kg of LPG). Distribution storage facilities are divided into four types, according to their storage capacity and the type of containers they allow: • **Subtype A storage facilitie**s have a maximum storage capacity of 1 500			distributors or retailers have to open several distribution storage facilities of subtypes A and B, instead of being able to serve them from one larger storage facility. This increases costs for LPG distributors. For example, a supermarket holding a permit to distribute LPG through retail storage facilities (*bodegas de expendio*) might be affected by the maximum storage capacity, such as the 1 500 kg of LPG maximum of subtype A allowing it to store only 150 cylinders at a time. Operating at such a small scale may not be profitable.	*distribución*) in the Mexican territory. ASEA is currently working on an update of this NOM (ANTE-PROY-NOM-017-ASEA-2017, Diseño, construcción, operación y mantenimiento, Cierre y Desmantelamiento de Bodegas de Distribución de Gas Licuado de Petróleo, mediante Recipientes Portátiles y Recipientes Transportables sujetos a presión) and is investigating among other factors, maximum storage capacity, safety distances, fire-protection systems, characteristics of cylinder-storage cabinets (*gabinetes*) and emergency procedures. When comparing the current regulation with international best practice, ASEA has confirmed that high-capacity storage	

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				kg of LPG in portable cylinders for direct sales in retail stores or for distribution through delivery trucks. To the best of the OECD's understanding, subtype A storage facilities are equivalent to the retail storage facilities (*bodegas de expendio*) defined in Article 2, letter III of the Reglamento de las actividades a las que se refiere el título tercero de la Ley de Hidrocarburos. • **Subtype B storage facilities** have a maximum storage capacity of 1 500 kg of LPG in transportable cylinders for direct sales to end-consumers, and redispatch to other storage facilities and delivery trucks. • **Subtype C storage facilities** have a maximum storage capacity of 20 000 kg of LPG in transportable cylinders for redispatch to other storage facilities or delivery trucks. • **Subtype D storage facilities** have a maximum storage capacity of 50 000 kg of LPG in transportable				facilities are not suitable for retail sales to the public either for specialised retail storage facilities (*bodegas de expendio de fin específico*) or for points of sale at commercial establishments (*puntos de venta en establecimientos comerciales*).	

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				cylinders only for redispatch to other storage facilities. Subtype C and D distribution storage facilities are prohibited from direct sales or any other commercial activity to end users.					
11	Resolución por la que la Comisión Reguladora de Energía expide las disposiciones administrativas de carácter general que establecen las especificaciones de los requisitos a que se refieren los artículos 50 y 51 de la Ley de Hidrocarburos, los formatos de solicitudes de permiso y los modelos de los títulos de permisos para realizar las actividades de almacenamient	DACG: Annex I from RES/790/ 2015: Fourth disposition , section iii., number 2, letter a)	Permits / Barrier to entry	Transport, storage, distribution and retail of LPG require a CRE permit. Several market participants claim that an applicant for a CRE permit must present an electronic document proving *ownership* of the property that the applicant wishes to use and for which the permit should be issued (e.g. land for the construction of a gas-storage tank or distribution plant). However, the current legislation actually requires applicants to provide an electronic document that proves ownership *or* possession *or* a legal title for the legal use of the property (*terrenos o predios*). Also, CRE has stated that it does not require ownership and that rental	CRE	A2	If applicants have to acquire property before they can apply for a permit, they would be required to invest without the certainty of later receiving a permit. In addition, they would have to incur opportunity costs during the waiting time for the permit. However, CRE does not require applicants to prove ownership, only legal use.	To ensure that companies will be able to provide the service correctly for which the permit is granted. Applicants need to prove that they can legally use (*disponen del legal uso*) the proposed premises for their commercial activity.	No recommendation.

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	o, transporte, distribución y expendio al público de gas licuado de petróleo. DOF: 15-12-2015			agreements would be regarded as sufficient, for instance.					
12	Resolución por la que la Comisión Reguladora de Energía expide las disposiciones administrativas de carácter general que establecen las especificaciones de los requisitos a que se refieren los artículos 50 y 51 de la Ley de Hidrocarburos, los formatos de solicitudes de permiso y los modelos de los títulos de permisos para realizar las actividades de almacenamiento, transporte, distribución y	Formato de "Solicitud de Permiso de Distribución de Gas Licuado de Petróleo mediante Planta de Distribución"	Permits / Barrier to entry	A company wishing to distribute LPG through distribution plants needs a CRE permit. Usually, the company will own a distribution plant including LPG storage facilities from where it will distribute LPG using tanker trucks or cylinder-delivery trucks. Several market participants claim that applicants are forced to present a list of the delivery vehicles they own and which will be used to provide the service, meaning that companies have to acquire their own trucks before they can apply for a permit. Yet the legislation does not actually require applicants to own vehicles before applying for a permit to distribute LPG through plants. This was confirmed by CRE. In fact, applicants must register all the	CRE	A2	If applicants have to acquire vehicles before they can apply for a permit, they will incur opportunity costs. CRE, however, only requires companies to register their vehicles once they are permit holders.	Ensure that companies will be able to provide the service of LPG distribution.	No recommendation.

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	expendio al público de gas licuado de petróleo. DOF: 15-12-2015			vehicles (either their own or from a third party) they will use to provide the service only after they have become permit holders.					
13	Ley Federal de Derechos. Last reform: DOF, 07-12-2016 (Cantidades actualizadas por Resolución Miscelánea Fiscal DOF: 22-12-2017)	Article 58	LPG distribution through pipelines / Barrier to entry	In order to distribute LPG through pipelines, companies must apply to CRE for a permit and pay a fee of MXN 645 510.97 for the evaluation of applications, even if the permit is not granted. Permit holders must then pay an annual fee for the surveillance of permits of MXN 519 229.65. Finally, if a permit title is modified (e.g. when a permit holder wants to modify its distribution-network installations) and this requires technical, legal or financial analysis from CRE or any other federal government authority, companies must pay fees amounting to 50% of the original fee.	CRE	A2, A4	CRE uses surveillance fees, as well as fees for permit modifications, to raise revenue and finance itself. According to market participants, surveillance fees are not charged for actual work performed by CRE, but are rather a form of taxation.	The objective of surveillance fees is to create a steady revenue and finance CRE. They provide CRE with a high degree of budgetary independence and autonomy of the government. To finance their total budgets, Article 29 of the Ley de los Órganos Reguladores Coordinados en Materia Energética states that CRE and CNH can use any income from the rights and fees (*derechos y aprovechamientos*) related to their services for the issuance and management of permits, authorisations, assignments and contracts, as well as for the activities and	No recommendation. The payment of annual surveillance fees does not discriminate between competitors, since they must be paid by all permit holders. Securing a steady income and financing CRE is a legitimate objective.

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								procedures that are in accordance to their attributions. According to CRE, the amounts of these rights and fees have to be approved by the SHCP in accordance with a methodology that SHCP applies to the entire federal public administration.	
14	Resolución por la que la Comisión Reguladora de Energía expide las disposiciones administrativas de carácter general que establecen las especificaciones de los requisitos a que se refieren los artículos 50 y 51 de la Ley de Hidrocarburos, los formatos de solicitudes de permiso y los modelos de los títulos de permisos para	DACG DOF 15-12-2015: Annex I from RES/790/2015: Fourth disposition, section I, letter ii., number 1. DACG DOF 25-01-2017: Fourth disposition, section I., letter ii., number 1.	Authorisation / Shareholder structure	Applicants to several types of LPG-related permits (i.e. storage, transport, distribution and retail) must present CRE, through the Electronic Filing Office (Oficialía de Partes Electrónica, OPE), with an electronic document identifying "the participation of each one of the associates or stakeholders, direct or indirect, be they present in the wholesale or retail, as well as of the persons or group of persons that hold control of the corporation (*sociedad*), that have any part of the shares and/or rights that are inherent to the participation in the capital structure".	CRE	A2, A3	Market participants have complained about the high administrative burden required to fulfil this obligation.	According to CRE, requiring this information from permit holders corresponds to international best practice. It allows CRE to identify economic interest groups in the LPG market, as well as to facilitate the enforcement of Article 83 of the Hydrocarbons Law, which states that, with the objective of promoting an efficient development of competitive energy markets (i.e. transport, storage, distribution, retail and commercialisation of hydrocarbons, oil	No recommendation.

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	realizar las actividades de almacenamiento, transporte, distribución y expendio al público de gas licuado de petróleo. DOF: 15-12-2015 Resolución de la Comisión Reguladora de Energía que expide las disposiciones administrativas de carácter general que establecen las especificaciones de los requisitos a que se refieren los artículos 50 y 51 de la Ley de Hidrocarburos, el formato de solicitud de permiso y el modelo del título de permiso para realizar la actividad de distribución de			A corporation is defined as any group of two or more persons that has the obligation, through a common agreement, to contribute to the development of a commercial activity. "Group of persons" in turn is defined as those with any kind of agreements to act in the same direction. Moreover, persons with kinship up to the fourth degree, spouses and cohabitants (the amount of time required for the cohabitation regime depends on state law) are considered as part of a group of persons.				products and petrochemicals), CRE, with the support of COFECE, may establish regulation that includes the strict legal separation of activities related to the permits.	

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	gas licuado de petróleo por medio de auto-tanques. DOF: 25-01-2017								
15	Términos y condiciones de AmiGas Lp, con última actualización el 22 de noviembre de 2017 Ley de Ingresos de la Federación para el Ejercicio Fiscal de 2018. DOF: 15-11-2017	Terms and conditions: General Law: Article 26, section I., letter a)	Market transparency / LPG retail	CRE created a smartphone app called AmiGas LP to facilitate consumers' LPG purchases. When holders of permits for the distribution and retail of LPG change their prices, they must report this change to CRE at least 60 minutes before applying the new prices in the market. In addition, permit holders are obliged to transfer to CRE, on a daily basis, information on bought and sold volumes of LPG. Using the information above, CRE created an official smartphone app called AmiGas LP, which among other functionalities, provides consumers with a list of all LPG distributors (cylinder-delivery trucks and tanker trucks) operating near their location, ranked by price and user ratings (evaluations are based on	CRE	A2, C2	The AmiGas LP app might lead to competitors being able to co-ordinate their LPG prices more easily. Increased market transparency allows LPG distributors to compare their prices with those of their competitors at no cost and with little effort. In particular, in areas where numerous LPG distributors operate, the AmiGas LP app might actually make price co-ordination possible. There is the danger that if a distributor wants to lower its price to gain market share, it would have to report that plan in advance to CRE. Competitors would learn of that initiative within a short timeframe and	CRE created the AmiGas LP app to facilitate consumers' purchases by reducing search costs and allowing them to find the best offer. The app also allows CRE to oversee the LPG distribution market and fight illegal selling. According to CRE, the prices published in AmiGas LP are always real-life, applied prices, never prices that have only been announced. Companies should therefore be unable to know beforehand the prices their competitors will charge. Moreover, distributors are allowed to offer discounts with respect to the prices listed in AmiGas LP. These limitations will make co-ordination more	No recommendation. The OECD does suggest, however, that CRE continuously improves the platform of AmiGas LP as user ratings are currently extremely low. Also, CRE should remain aware of the app's potential as a tool for co-ordination and constantly monitors its effects.

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				customer ratings ranging from one to five stars). AmiGas LP went live in March 2018.			be able to react by lowering their own prices. That would result in the initial distributor not gaining any market share, while losing margins.	difficult, even impossible. In addition, in economic literature, the net competitive effects of price transparency mechanisms are contested. On one hand, it is argued that price transparency has the potential to intensify competition since consumers have better information and search costs are reduced. On the other hand, price transparency could facilitate companies' monitoring of their rivals, and so aid price co-ordination. Without an ex post intervention (i.e. a study carried out after the implementation of the information disclosure policy), it is difficult to determine which of these two effects dominates. Also, empirical studies have yielded mixed results. For instance, Rossi & Chintagunta	

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								(2015) investigated how the introduction of electronic signs with prices near gasoline stations on Italian motorways affected their pricing, and found a 20% decrease in stations' margins after their arrival. Luco (2018) analysed the sequential implementation of an online disclosure policy in the Chilean gasoline industry. He found that disclosure resulted on an average 9% margin increase, but this effect varied depending on the intensity of local search behaviour. **References** Luco F. (2018), "Who Benefits from Information Disclosure? The Case of Retail Gasoline", *American Economic Journal*. Rossi, F. & Chintagunta P.K. (2015), "Price Transparency and Retail Prices: Evidence from Fuel Price Signs in the Italian Motorway System," *Journal of Marketing Research*.	

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16	Acuerdo por el que la Comisión Reguladora de Energía emite las Disposiciones administrativas de carácter general que establecen el alcance y procedimiento general para el registro estadístico de las transacciones comerciales de gas licuado de petróleo. DOF: 27-07-2018.	(General)	LPG storage, transport, retail and distribution / Hydrocarbons of illegal origin	Companies that hold CRE permits for the storage, transport, distribution, retail and commercialisation of LPG must register their transactions on an electronic platform known as the Statistical Record of Commercial Transactions System for LPG (Sistema del Registro Estadístico de Transacciones Comerciales de Gas Licuado de Petróleo, SIRETRAC GLP). This systems registers all transactions along the value chain to detect hydrocarbons of illegal origin (e.g. LPG stolen from trucks or storage facilities). Market participants claim that the adoption of SIRETRAC GLP will entail high administrative costs for training staff to use the system. CRE acknowledges that while the implementation of SIRETRAC GLP will entail new administrative costs for regulated companies, it will also eliminate a number of other regulations and, overall, reduce costs for companies.	CRE	A2	Data entry into SIRETRAC GLP is an administrative burden as regulated companies must train staff in the use of the system.	SIRETRAC GLP aims, among other things, to guarantee the traceability of LPG across all segments of the value chain. This allows the trade in illegal LPG to be reduced. **International comparison** According to CRE, SIRETRAC GLP is based on a similar system implemented by the Peruvian government in 2004. The Control System of Request Orders (Sistema de Control de Órdenes de Pedido, SCOP) was created by Peru's Supervisory Agency for Investment in Energy and Mining (Organismo Supervisor de la Inversión en Energía y Minería, OSINERGMIN) and has proved effective in reducing the theft of oil products along the value chain (see, www.cre.gob.mx/docu	No recommendation.

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								mento/PresentacionCREJSL09_02_17.pdf).	
17	Reglamento de las actividades a que se refiere el Título Tercero de la Ley de Hidrocarburos. DOF: 31-10-2014	Article 11	Natural-gas permits / Administrative burden	The following natural-gas-related activities require a permit from CRE: processing of natural gas; export of natural gas; transport, storage, distribution, compression, decompression, liquefaction, regasification, commercialisation, retail sales, and management of integrated systems. (Letter XXXVI of Article 4 of the Hydrocarbons Law defines integrated systems as systems for the transport of gas through pipelines and its storage grouped together for tariff purposes and with general conditions for the provision of services, allowing for the operational co-ordination between different infrastructures.) The requirements that must be fulfilled to obtain these permits are established in Articles 50 and 51 of the Hydrocarbons Law. Application forms for these CRE permits are available at:	SENER, CRE	A2, B4	None of the relevant permits confer exclusivity rights or foreclose other participants from the market. The duration of permits, however, might pose competition concerns as, due to the lack of guidelines, authorities could theoretically discriminate between applicants, within a given activity, granting permits with different durations to different applicants. A competitor having to renew a permit with a shorter duration would have to bear additional costs in comparison to a competitor holding a permit with a longer duration. However, it seems that in practice no discrimination between competitors has taken or is taking place.	The objective of the requirement to apply for a permit is that holders fulfil all requirements necessary to properly carry out the activities in question. The duration of each permit should depend on the length of time that it seems reasonable to allow before re-evaluating if all requirements are still being fulfilled.	CRE should issue guidelines for determining the duration of natural-gas-related permits depending on the specific activity in order to give more transparency to market participants.

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				www.cre.gob.mx/gasnatural.html. All these types of permits, with the exception of SENER permits to export natural gas, can be granted for up to 30 years, and can be extended once for up to half of their original duration. Hence, each CRE permit can be valid for a total of up to 45 years. According to CRE, the same duration of permit is granted for the same type of permit for all permit applicants and no discrimination takes place. However, as guidelines do not exist, it would theoretically be possible for CRE and SENER to grant permits with different durations to different applicants for the same activity.					
18	Estatuto Orgánico de Pemex Etileno. DOF: 04-05-2017	Article 45, section XIV	Risk of price co-ordination / VPM	PEMEX Etileno is a PEMEX subsidiary that produces, distributes and commercialises derivatives of methane (the main component of natural gas). PEMEX Etileno's management responsibilities (*gerencia*	PEMEX Etileno's board of directors	B1, C2	This provision may facilitate collusion since it states that PEMEX Etileno should coordinate with producers, distributors and retailers of methane.	The objective of the provision is to allow PEMEX Etileno to acquire market information that will aid in the planning of new investment projects or conducting its business.	Clarify in the legislation that PEMEX Etileno must take into account Article 53, letter V of the Ley Federal de Competencia Económica and COFECE's guidelines on information exchange (Guía 007/2015: Guía para el Intercambio de Información entre Agentes

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				de comercialización) include being in contact with industrial associations and petrochemical producers to exchange information about the markets in which PEMEX Etileno is active, as well as to find new business and investment projects opportunities. The provision does not specify the scope of the market information to be exchanged.					Económicos), which give guidance on how COFECE evaluates the exchange of information between economic agents.
19	Reglamento de las actividades a que se refiere el Título Tercero de la Ley de Hidrocarburos. DOF: 31-10-2014 Acuerdo por el que la Comisión Reguladora de Energía determina a todo el territorio nacional como zona geográfica única para fines de distribución	Bylaw: Article 39 and 40 Agreement: General	Permits, geographical zones / Administrative burden	CRE grants permits for the distribution of natural gas through pipelines. Permits are granted for a duration of up to 30 years and can be extended once for half of their initial duration. Prior to the 2013 energy reform, permits for the distribution of natural gas through pipelines were exclusive, meaning that there was only one distributor for each geographical zone. This is no longer the case as neither the Hydrocarbons Law nor the Reglamento de las actividades a que se refiere el Título Tercero de la Ley de	CRE	A1, A2	With the publication of the 24 January 2018 agreement, natural-gas distributors no longer need to apply for several permits in order to serve a wider geographical area than their original permit, as long as distribution networks are continuous. This lifts certain administrative burdens. However, the requirement that permits are only granted for continuous networks	According to CRE, if permits were granted for discontinuous networks, companies might cross-subsidise systems in different regions (likely because price differences between different regions would be levelled if there was only one unitary price for all of Mexico), which, in turn, might generate barriers to entry.	No recommendation.

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	de gas natural. DOF: 24-01-2018			Hidrocarburos make any mention of exclusivities. In addition, on 24 January 2018, CRE published an agreement (Acuerdo por el que la Comisión Reguladora de Energía determina a todo el territorio nacional como zona geográfica única para fines de distribución de gas natural) in the DOF, which determined that the entire Mexican territory is a single natural-gas distribution zone. This agreement revoked a 1996 CRE directive (DIR/GAS/003/96) that contained a methodology for determining geographical zones. According to the January 2018 agreement, CRE will grant a permit for each separate distribution system that constitutes a continuous network. Previously, whenever a distribution permit holder wanted to extend its pipelines beyond the geographical area for which the permit had been granted, the permit holder had to modify its permit			might be regarded as an administrative burden as an applicant will need more than one permit if its distribution networks is discontinuous.		

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				title and pay an additional fee. According to the new legislation, as long as a distribution system is continuous, there is no longer any need to modify permits. As a consequence, in principle, it should be easier for distributors to extend their networks. On first reading, however, there appears to be a contradiction between the 24 January 2018 CRE agreement and Article 39 of the Reglamento de las actividades a que se refiere el Título Tercero de la Ley de Hidrocarburos, since the latter states that CRE will grant permits for a "specific geographical zone", while the 24 January 2018 agreement refers to a "unique geographical zone". However, according to CRE, following the 24 January 2018 agreement, the "specific geographical zone" is the same as the "unique geographical zone" for all permit applications.					

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				Six permits have been granted with exclusivity for a specific geographical zone. These permits, which were granted before the 2018 agreement, are G/301/DIS/2012, G/310/DIS/2013, G/323/DIS/2014, G/347/DIS/2014, G/353/DIS/2015, and G/13759/DIS/2016. The length of these permits varies between 7 and 11 years. These permits were not revoked with the publication of CRE's 2018 agreement and the terms under which these permits were granted will be respected until they expire.					
20	Ley Federal de Derechos. Last reform: DOF, 07-12-2016 (Cantidades actualizadas por Resolución Miscelánea Fiscal DOF: 22-12-2017)	Article: 57	Natural-gas distribution / Fees	In order to distribute natural gas, companies must apply to CRE for a permit and pay a fee for the evaluation of applications, even if the permit is not granted. The current fee is MXN 656 406.06. Furthermore, holders of permits to distribute natural gas must pay an annual fee for surveillance of permits of MXN 519 229.65. Also, if a permit title is modified (e.g.	CRE	A2, A4	CRE uses surveillance fees and fees for modification of permits to collect revenue and finance itself. According to market participants, surveillance fees are not charged for actual work performed by CRE, but are a form of tax.	The objective of the surveillance fees is to create a steady income to finance CRE. The fees provide CRE a high degree of budgetary independence and autonomy from the government. According to Article 29 of the Ley de los Órganos Reguladores Coordinados en Materia Energética, in	No recommendation. The payment of annual surveillance fees does not discriminate between competitors since they must be paid by all permit holders. Securing a steady income and financing CRE is a legitimate objective.

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				if the permit holder wants to modify the technical, operative and design conditions of the distribution system), companies must pay fees amounting to 50% of the original fee if a technical, legal or financial analysis from CRE or any other federal government authority is required. Finally, every five years, CRE evaluates permit titles. If it modifies a permit after this revision, the permit holder must pay CRE an additional MXN 439 968.66.				order to finance their total budget, CRE and CNH can dispose of any income coming from the rights and fees (*derechos y aprovechamientos*) that are related to their services for the issuance and management of permits, authorisations, assignments and contracts, as well as for the activities and procedures that are in accordance with their attributions. According to CRE, the amounts of these rights and fees have to be approved by the SHCP in accordance with a methodology that SHCP applies to the entire federal public administration.	
21	Lack of a one-stop shop to deal with energy authorities.	---	Double legislation / One-stop shop	There is no one-stop shop (*ventanilla única*) to deal with authorities in the natural gas.	ASEA, CRE, CNH	A4	Participants in the LPG and natural-gas sectors have to apply and deal separately with ASEA, CRE and CNH. Industry participants have reported that	There does not seem to be any objective behind the lack of a one-stop shop to deal with authorities. In its 2017 report *Driving Performance of Mexico's Energy*	Introduce a one-stop shop for procedures related to ASEA, CRE and CNH. Also, study the possibility of including SENER and SAT in this one-stop shop.

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							sometimes it is unclear which authority to contact and that there can be double controls, leading to companies having to provide the same information twice.	*Regulators*, the OECD recommended establishing "a constituency that can work on a co-ordinated approach to supporting administrative simplification, as well as enforcement and inspection in the sector, to create synergies between regulators and minimise cost for the regulated industry". ASEA, CRE and CNH are working on a one-stop shop, and have made progress on the matter. Indeed, in early 2018, the three agencies decided to create the Office of Coordinated Assistance to the Energy Sector (Oficina de Asistencia Coordinada del Sector Energético, ODAC), which aims to provide assistance to companies in processes involving more than one energy regulator. According to	

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								CRE, ODAC is a first step in the creation of a one-stop shop.	
22	Ley de los Órganos Reguladores Coordinados en Materia Energética. DOF: 11-08-2014 Ley de la Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos. DOF: 11-08-2014.	Ley de los Órganos Reguladores Coordinados en Materia Energética: Article 22, section XIII Ley de la Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos: Article 5, section VIII	Double legislation / Verification visits	Companies that operate in the LPG and natural-gas sectors are subject to verification inspections (*visitas de verificación*) by CRE and ASEA. According to market participants, while legislation clearly establishes the powers of the two authorities – namely, CRE regulates the midstream and downstream sectors of hydrocarbons to promote the efficient development of the industry, while ASEA oversees industrial and operational safety and environmental protection along the entire hydrocarbons value chain – in practice, there seems to be some overlap in the requirements demanded by authorities during verification visits. To the best of the OECD's understanding, only CRE has guidelines to carry out verification visits (Acuerdo por el que la Comisión Reguladora de Energía	ASEA, CRE	A3, A4, B3	Due to ASEA's lack of guidelines, it is difficult to verify if market participants' claims of overlapping requirements during inspection visits (*visitas de verificación*) by CRE and ASEA are true. If they are, companies operating in the LPG and natural-gas sectors might be incurring double costs for doubled requirements. This could have a higher impact on small companies as verification costs might account for a higher share of their overall costs.	There appears to be a lack of co-ordination between ASEA and CRE when carrying out inspection visits. One of the recommendations in OECD's 2017 report *Driving Performance of Mexico's Energy Regulators* was: "Ensure that overlaps are kept to the bare minimum among agencies by clarifying and aligning their goals and priorities and publicly communicate on these priorities." CRE points out that it created, together with ASEA and CNH, the Oficina de Asistencia Coordinada del Sector Energético (ODAC), which aims to co-ordinate processes involving more than one energy regulator. Also, CRE states that it already made one joint verification visit	Issue guidelines for co-ordinated inspection visits by CRE and ASEA. Establish an interagency body between CRE and ASEA for co-ordinating inspection visits. While CRE and ASEA's inspection visits do not serve the same purposes, there might still be some overlap that would allow for joint inspection visits.

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				expide los criterios y la metodología para determinar las visitas de verificación o inspección que deberán llevarse a cabo, published in the DOF of 11 November 2016). CRE's methodology is based on OECD's 2014 report *Regulatory Enforcement and Inspections: OECD Best Practice Principles for Regulatory Policy*. No similar guidelines were found for ASEA.				with ASEA in 2017. Finally, it claims that verification visits of different agencies serve different purposes.	
23	Disposiciones administrativas de carácter general que establecen los Lineamientos para la autorización, aprobación y evaluación del desempeño de terceros en materia de seguridad industrial, seguridad operativa y de protección al medio ambiente del	General	Authorisation / Third parties	ASEA use "third parties" for supervision, surveillance, assessment, investigation and auditing of the General Administrative Provisions (Disposiciones Administrativas de Carácter General, DACG) that it issues. It grants authorisations to corporate entities (*personas morales*) to become "third parties in the matters of industrial safety, operational safety and protection of the environment in the hydrocarbons sector". ASEA-authorised third parties are required for companies operating in the LPG and natural-gas sectors.	ASEA	A3	Competition between authorised third parties is limited because there are currently too few active in the market. Contracting them can be costly for companies in the LPG and natural-gas sectors.	ASEA uses independent third parties to ensure compliance with regulations for industrial and operative safety and environmental protection. According to ASEA, the low number of third parties is due to a lack of suitable candidates.	Take additional measures to increase the number of ASEA-authorised third parties in the market. These measures could include re-evaluating the conditions for authorising third parties and more widely publicising the calls for third parties.

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	Sector Hidrocarburos. DOF: 29-07-2016			Applicants for authorisation to become third parties must, among other requirements, present their previous year's tax declaration, take out civil-responsibility insurance, have a quality system that meets the ISO 9001 international standard or equivalent, and sign a non-conflict-of-interest declaration. Furthermore, applicants must comply with the technical requirements specific to the regulation in question. ASEA runs calls for corporate entities interested in becoming third parties. These calls are published in the DOF. As of 12 March 2018, ASEA had run nine calls. These calls remain open to the public, so interested parties can apply at any time. Nevertheless, market participants say that the limited number of authorised third parties leads to high fees for their services (according to some market participants, as much as eight times as high in comparison to non-authorised third parties).					
24	Lack of distribution of comparisons of	---	Price comparisons / Limited	There is currently no easy-access database that enables residential	CRE	D3	Residential consumers do not have easy access to	CRE states that it is currently working on a tool to compare end-	Introduce a tool (e.g. a website or an app) that enables residential consumers to compare the prices

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	residential consumer prices for LPG and natural gas.		consumer access	consumers to compare LPG and natural-gas prices. According to sector participants, natural-gas prices for residential consumers can be up to 15-20% lower than LPG prices; however, there is low diffusion or knowledge of price differences among consumers.			price comparisons of LPG and natural gas, so might not take optimal decisions.	consumer prices for LPG and natural gas.	of LPG and natural gas in their area. The information published in this tool should be presented in an aggregated form (e.g. average price in that area) to prevent the tool leading to illegal information exchange and co-ordination among distributors.
25	Disposiciones administrativas de carácter general que establecen los lineamientos para que los Regulados lleven a cabo las Investigaciones Causa Raíz de Incidentes y Accidentes ocurridos en sus Instalaciones. DOF: 24-01-2017.	(General)	Industrial safety / Root-cause analysis	Companies active in the hydrocarbons sector must carry out root-cause analysis investigations (*investigaciones de causa raíz*, ICR) after an accident or incident takes place (e.g. a gas leak, a fire or explosion). These investigations aim to identify the cause of accidents or incidents and issue preventive and corrective recommendations to avoid their reoccurrence. The events that can trigger an ICR are classified according to their severity into three types: 1) A Type 3 event is the most severe and can consist of, for example, two or more deaths on or off the premises, harm to premises	ASEA	A2	The requirement to carry out an ICR increases the costs of doing business. This might have a disproportionate impact on small companies in the hydrocarbons sector.	ICR investigations seek to identify the causes of accidents and incidents, to issue preventive and corrective recommendations, in order to prevent their reoccurrence.	No recommendation, since the objective of avoiding further accidents and incidents justifies the extra costs incurred by companies.

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				and operational disruption. 2) A Type 2 event might consist of one or more deaths on the premises. 3) A Type 1 event might consist of injuries that require medical leave and which occurred in the exercise or as a result of work tasks. Regulated companies can carry out Type 1 ICR themselves or contract an ASEA-authorised third party. For Type 2 events, regulated companies can carry out Type 2 ICR themselves, unless there are one or more deaths on the premises, in which case it is obligatory to contract an authorised third party. For all Type 3 events, regulated companies must contract an authorised third party. According to market participants, the costs of conducting ICR are extremely high, reducing any incentives regulated companies might have to report accidents and incidents.					
26	Disposiciones administrativas	General	Industrial safety / Risk	Companies that retail natural gas, and those that distribute	ASEA	A2	The creation, implementation and	SASISOPA seek to prevent, control and	No recommendation.

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	de carácter general que establecen los Lineamientos para la conformación, implementación y autorización de los Sistemas de Administración de Seguridad Industrial, Seguridad Operativa y Protección al Medio Ambiente aplicables a las actividades de Expendio al Público de Gas Natural, Distribución y Expendio al Público de Gas Licuado de Petróleo y de Petrolíferos. DOF: 16-06-2017		management system	and retail LPG, must implement a system to manage industrial and operative risks. These systems, known as Management Systems for Industrial Safety, Operational Safety and Environmental Protection (Sistemas de Administración de Seguridad Industrial, Seguridad Operativa y Protección al Medio Ambiente, SASISOPA), have 18 elements related, for example, to the identification, analysis, assessment, monitoring and mitigation of risks. Once a company has created its SASISOPA, it requests ASEA authorisation and the plan is recorded in the registry. Companies then have to develop an implementation programme that also needs ASEA approval. Finally, a company's SASISOPA are audited internally and then externally by an ASEA-authorised third party every two years. ASEA has published guidelines to help regulated companies elaborate their			follow-up of SASISOPA entail administrative costs for companies. These could negatively affect small companies active in the retail of natural gas, and the distribution and retail of LPG disproportionately.	improve the performance of premises in industrial safety, operational safety and environmental protection. **International comparison** According to ASEA, it is international best practice for companies retailing natural gas, and distributing and retailing LPG to adopt similar systems to SASISOPA.	

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				SASISOPA (www.gob.mx/cms/uploads/attachment/file/264154/Gua_SASISOPA_VALIDADA_FINAL.pdf.) According to market participants, the creation, implementation and follow-up of SASISOPA entail high costs. ASEA believes that the creation of SASISOPA does not represent an excessive cost for regulated companies, as frequently they already have the elements needed for SASISOPA, albeit not in a structured way. ASEA has organised workshops, at federal and regional level, to guide regulated companies in creating their own SASISOPA.					
27	NOM-001-SESH-2014, Plantas de distribución de Gas L.P. Diseño, construcción y condiciones seguras en su operación. DOF: 22-10-2014.	Number 10	Non-accordance of standards	NOM-001-SESH-2014 sets the minimum technical and safety requirements for the design and construction of LPG distribution plants where the minimum operational temperature is not inferior to -15° Celsius. It specifically states that it is not in line with international norms. It also states that no international	ASEA, SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms for Mexico and abroad, adding costs. Even in cases where	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria.	Update the NOM so it is in accordance with international standards as far as possible. Certain current practices may already meet international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

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				reference existed when the NOM was introduced.			Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	According to the *National Standardisation Programme 2018* (*Programa Nacional de Normalización 2018*), this NOM will be modified during 2018 (see, http://dof.gob.mx/nota_detalle.php?codigo=5515780&fecha='12'/03/2018).	
28	NOM-002-SECRE-2010, Instalaciones de aprovechamiento de gas natural (cancela y sustituye a la NOM-002-SECRE-2003, Instalaciones de aprovechamiento de gas natural). DOF: 04-02-2011.	Number 15	Non-accordance of standards	NOM-002-SECRE-2010 sets the minimum safety requirements to be met in terms of design, materials, construction, installation, hermeticity testing, operation, maintenance and safety of natural-gas facilities. It specifically states that it is not in line with international norms. It also states that this non-accordance is due to Mexico's specificity.	SENER through CRE	A5	If there is a specificity for Mexico, it should be explicitly stated. Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

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							with international standards, there might be confusion among market participants.		
29	NOM-002-SESH-2009, Bodegas de distribución de Gas L.P. Diseño, construcción, operación y condiciones de seguridad. DOF: 20-05-2009.	Number 12	Non-accordance of standards	NOM-002-SESH-2009 sets the minimum safety requirements to be met in the design and construction of storage facilities for LPG distribution. It specifically states that it is not in line with international norms.	ASEA, SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be modified in 2018. The name of that draft, according to ASEA, is ANTE-PROY-NOM-017-ASEA-2018, Bodegas de Distribución y Bodegas de Expendio de Gas Licuado de Petróleo, mediante Recipientes Portátiles y Recipientes Transportables sujetos a presión.	Update the NOM so it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist any international standards or best practices.

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30	NOM-003-ASEA-2016, Distribución de gas natural y gas licuado de petróleo por ductos. DOF: 18-08-2017.	Number 11	Non-accordance of standards	NOM-003-ASEA-2016 establishes the specifications and technical criteria for the industrial and operative safety and environmental protection for the design, construction, pre-start, operation, maintenance, closing and dismantling of the distribution systems of natural gas and LPG through pipelines. It specifically states that it is not in line with international norms.	ASEA	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria.	Update the NOM so that it is as far as possible in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.
31	NOM-003-SEDG-2004, Estaciones de gas L.P. para carburación. Diseño y construcción. DOF: 28-04-2005.	Number 18	Non-accordance of standards	NOM-003-SEDG-2004 sets the minimum technical safety requirements to be met in the design and construction of LPG stations for fuel with fixed storage facilities, and which are exclusively used to fill LPG-fuelled vehicles. It specifically states that it is not in line with	ASEA, SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
				international norms. The norm also states that no international reference existed at the time the NOM was written.			abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be modified during 2018.	
32	NOM-004-SEDG-2004, Instalaciones de aprovechamiento de Gas L.P. Diseño y construcción. DOF: 02-12-2004. Acuerdo que determina la utilización de una medida alternativa para el cumplimiento de las finalidades de la Norma Oficial Mexicana NOM-004-SEDG-2004, Instalaciones de aprovechamiento	Number 13	Non-accordance of standards	NOM-004-SEDG-2004 sets the minimum safety requirements to be met in the design, construction and modification of fixed and permanent facilities for LPG utilisation. It specifically states that it is not in line with international norms. The norm also states that no international reference existed at the time the NOM was written.	SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

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	de Gas L.P. Diseño y construcción. DOF : 07-12-2009.						might be confusion among market participants.		
33	NOM-005-SESH-2010, Equipos de carburación de Gas L.P. en motores de combustión interna. Instalación y mantenimiento. DOF: 26-11-2010.	Number 16	Non-accordance of standards	NOM-005-SESH-2010 sets the minimum safety requirements, specifications and testing methods to be met by LPG fuel systems for internal-combustion engines. It specifically states that it is not in line with international norms. The norm also states that no international reference existed at the time the NOM was written.	SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.
34	NOM-006-SESH-2010, Talleres de equipos de carburación de Gas L.P.-	Number 13	Non-accordance of standards	NOM-006-SESH-2010 sets the minimum technical requirements for the design, construction, operation, safety and training at mechanical	SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which

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	Diseño, construcción, operación y condiciones de seguridad. DOF: 26-11-2010.			workshops for LPG fuelling equipment. It specifically states that it is not in line with international norms. The norm also states that no international reference existed at the time the NOM was written.			markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.
35	NOM-007-SESH-2010, Vehículos para el transporte y distribución de Gas L.P.- Condiciones de seguridad, operación y mantenimiento. DOF: 11-07-2011. Aclaración a la Norma Oficial Mexicana NOM-007-SESH-2010, Vehículos para el transporte y	Number 13	Non-accordance of standards	These NOM set the minimum conditions for the safety, operation and maintenance that must be met for the use of vehicles that transport and distribute LPG. They specifically state that they are not in line with international norms.	ASEA, SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme for 2018*, this NOM will be modified during 2018.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

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	distribución de Gas L.P.- Condiciones de seguridad, operación y mantenimiento, publicada el 11 de julio de 2011. DOF: 21-09-2011. Acuerdo que determina la utilización de una medida alternativa para el cumplimiento de las finalidades de la Norma Oficial Mexicana NOM-007-SESH-2010, Vehículos para el transporte y distribución de Gas L.P.- Condiciones de seguridad, operación y mantenimiento. DOF: 22-12-2011.						not in compliance with international standards, there might be confusion among market participants.	ASEA says the draft is called ANTE-PROY-NOM-022-ASEA-2018 Transporte y distribución de Gas Licuado de Petróleo por medio de Tractocamión-Semirremolque, Auto-tanque y Vehículo de Reparto.	
36	NOM-009-SESH-2011, Recipientes	Number 13	Non-accordance of standards	These NOM set the minimum specifications for the design and	ASEA, SE, SENER	A5	Access for foreign competitors to the Mexican market may	In Mexico, a non-harmonised NOM has to be disclosed,	Update the NOM so that it is in accordance with international standards as far as possible.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	para contener Gas L.P., tipo no transportable. Especificaciones y métodos de prueba. DOF: 08-09-2011. Modificación a la Norma Oficial Mexicana NOM-009-SESH-2011, Recipientes para contener Gas L.P., tipo no transportable. Especificaciones y métodos de prueba. DOF: 08-10-2013.			manufacturing of non-transportable LPG containers not exposed to heating by artificial means and intended for the following uses: storage plants; distribution plants; LPG fuelling stations; facilities that use LPG; fuel deposits for internal-combustion engines and deposits for the transport or distribution of LPG through tanker trucks, trailers and semi-trailers. They specifically state that they are not in line with international norms. It also states that no international reference existed at the time the NOM was written.			be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.
37	NOM-010-SESH-2012, Aparatos domésticos para cocinar alimentos que utilizan Gas L.P. o Gas Natural. Especificaciones y métodos de prueba. DOF: 29-05-2013.	Number 15	Non-accordance of standards	These NOM set the minimum safety requirements for domestic cooking equipment that uses LPG or natural gas. They specifically state that they are not in line with international norms. It also states that no international reference existed at the time the NOM was written.	SENER, PROFECO	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

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	Nota Aclaratoria a la Norma Oficial Mexicana NOM-010-SESH-2012, Aparatos domésticos para cocinar alimentos que utilizan Gas L.P. o Gas Natural. Especificaciones y métodos de prueba, publicada el 29 de mayo de 2013. DOF: 19-12-2014.						Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.		
38	NOM-011/1-SEDG-1999, Condiciones de seguridad de los recipientes portátiles para contener Gas L.P. en uso. DOF: 30-03-2000.	Number 11	Non-accordance of standards	NOM-011/1-SEDG-1999 sets the minimum safety conditions for portable containers used to distribute LPG. The NOM also contains specifications for the marking of these containers so that it is possible to identify the owner-distributor. It specifically states that it is not in line with international norms. it also states that no international	SE, SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation*	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
				reference existed at the time the NOM was written.			international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	*Programme 2018*, this NOM will be cancelled and replaced during 2018.	
39	NOM-011-SECRE-2000 Gas natural comprimido para uso automotor. Requisitos mínimos de seguridad en instalaciones vehiculares. DOF: 23-10-2002. Aviso sobre la autorización para el uso de una tecnología alternativa para el cumplimiento de las finalidades de la Norma Oficial Mexicana NOM-011-SECRE-2000, Gas natural comprimido	Number 10	Non-accordance of standards	These NOM set the minimum safety requirements to be met by motor vehicles fuelled by compressed natural gas. They specifically state that they are not in line with international norms. It also states that no international reference existed at the time the NOM was written.	SENER through CRE	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	para uso automotor. Requisitos mínimos de seguridad en instalaciones vehiculares. DOF: 23-12-2014.								
40	NOM-011-SESH-2012, Calentadores de agua de uso doméstico y comercial que utilizan como combustible Gas L.P. o Gas Natural.- Requisitos de seguridad, especificaciones, métodos de prueba, marcado e información comercial (cancela a la NOM-020-SEDG-2003). DOF: 12-04-2013.	Number 15	Non-accordance of standards	NOM-011-SESH-2012 sets the minimum safety requirements, specifications, testing methods, markings and commercial information for domestic and commercial water heaters fuelled by LPG or natural gas and with a thermic charge of no more than 108 kW. It specifically states that it is not in line with international norms. It also states that no international reference existed at the time the NOM was written.	SENER, PROFECO	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
41	NOM-012-SESH-2010, Calefactores de ambiente para uso doméstico que empleen como combustible Gas L.P. o Natural. Requisitos de seguridad y métodos de prueba. DOF: 26-11-2010. Aclaración a la Norma Oficial Mexicana NOM-012-SESH-2010, Calefactores de ambiente para uso doméstico que empleen como combustible Gas L.P. o Natural. Requisitos de seguridad y métodos de prueba, publicada el 26 de noviembre de 2010. DOF: 16-06-2011. Modificación de la Norma	Number 12	Non-accordance of standards	These NOM set the minimum safety requirements and the testing methods for domestic room heaters fuelled by LPG or natural gas, as well as the commercial information to be displayed on the product label. They apply to domestic room heaters with a calorific power of 15 kW or less. They specifically state that they are not in line with international norms. They also state that no international reference existed at the time the NOM was written.	SENER, PROFECO	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

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	Oficial Mexicana NOM-012-SESH-2010, Calefactores de ambiente para uso doméstico que empleen como combustible Gas L.P. o Natural. Requisitos de seguridad y métodos de prueba. DOF: 14-10-2013.								
42	NOM-013-SEDG-2002, Evaluación de espesores mediante medición ultrasónica usando el método de pulso-eco, para la verificación de recipientes tipo no portátil para contener Gas L.P., en uso. DOF: 26-04-2002.	Number 10	Non-accordance of standards	NOM-013-SEDG-2002 deals with the evaluation using ultrasonic measurement of the thickness of the cylindrical section and caps of non-portable containers of LPG. It specifically states that it is not in line with international norms. It also states that no international reference existed at the time the NOM was written.	ASEA, SENER	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
							not in compliance with international standards, there might be confusion among market participants.	and replaced during 2018.	
43	NOM-014-SESH-2013, Conexión integral y conexión flexible que se utilizan en instalaciones de aprovechamiento de Gas L.P. o Gas Natural. Especificaciones y métodos de prueba. DOF: 16-10-2013.	Number 13	Non-accordance of standards	NOM-014-SESH-2013 sets the specifications, minimum safety requirements and testing methods used for integrated and flexible connections in natural-gas and LPG facilities, as well as the information displayed on the product and its packaging. It specifically states that it is not in line with international norms. It also states that no international reference existed at the time the NOM was written.	SENER, PROFECO	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.
44	NOM-015-SESH-2013, Reguladores de baja presión para Gas L.P.	Number 12	Non-accordance of standards	NOM-015-SESH-2013 sets the specifications, minimum safety requirements and testing methods to be met by low-	SENER, PROFECO	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	Especificaciones y métodos de prueba. DOF: 17-10-2013.			pressure controls for LPG, and the information displayed on the product and its packaging. It specifically states that it is not in line with international norms. It also states that no international reference existed at the time the NOM was written.			Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria.	international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.
45	NOM-016-CRE-2016 Especificaciones de calidad de los petrolíferos. DOF: 29-08-2016. Acuerdo de la Comisión Reguladora de Energía que difiere el término del primer periodo para dar cumplimiento a la obligación de	Number 9	Non-accordance of standards	These NOM set quality specifications to be met by oil products at each stage of the value chain. The NOM covers both Mexican-produced and imported oil products. They specifically state that they are not in line with international norms.	CRE	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation*	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

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	muestreo y la determinación de especificaciones de calidad de los petrolíferos de la NOM-016-CRE-2016, Especificaciones de calidad de los petrolíferos, a cargo de los permisionarios de expendio al público de gasolinas y diésel. DOF: 30-03-2017. Acuerdo de la Comisión Reguladora de Energía por el que se interpreta la obligación adicional (1) de la Tabla 5. Especificaciones generales de las gasolinas, así como el Segundo Transitorio de la Norma Oficial Mexicana NOM-016-CRE-2016, Especificaciones de calidad de los						international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	*Programme 2018*, this NOM will be cancelled and replaced during 2018.	

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	petrolíferos, para efectos del cumplimiento del parámetro aditivo detergente dispersante en gasolinas. DOF: 14-04-2017.								
	Acuerdo de la Comisión Reguladora de Energía que modifica la Norma Oficial Mexicana NOM-016-CRE-2016, Especificaciones de calidad de los petrolíferos, con fundamento en el artículo 51 de la Ley Federal sobre Metrología y Normalización. DOF: 26-06-2017.								
	Acuerdo de la Comisión Reguladora de Energía por el que se declara la terminación de la vigencia del artículo Segundo Transitorio, párrafo primero,								

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	de la Norma Oficial Mexicana NOM-016-CRE-2016, Especificaciones de calidad de los petrolíferos. DOF: 09-04-2018.								
46	NOM-042-SEMARNAT-2003, Que establece los límites máximos permisibles de emisión de hidrocarburos totales o no metano, monóxido de carbono, óxidos de nitrógeno y partículas provenientes del escape de los vehículos automotores nuevos cuyo peso bruto vehicular no exceda los 3,857 kilogramos, que usan gasolina, gas licuado de petróleo, gas natural y diesel,	Number 5	Non-accordance of standards	NOM-042-SEMARNAT-2003 sets maximum permissible emissions of total or non-methane hydrocarbons (HCNM), carbon monoxide (CO), nitrogen oxide (NOx) and particulates emitted by the exhaust systems of new vehicles with a gross weight that does not exceed 3 857 kg, powered by gasoline, LPG, natural gas or diesel, as well as emissions of evaporative hydrocarbons from the fuel systems of such vehicles. It specifically states that it is not in line with international norms.	SEMARNAT	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.

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	así como de las emisiones de hidrocarburos evaporativos provenientes del sistema de combustible de dichos vehículos. DOF: 07-09-2005.								
47	NOM-047-SEMARNAT-2014, Que establece las características del equipo y el procedimiento de medición para la verificación de los límites de emisión de contaminantes, provenientes de los vehículos automotores en circulación que usan gasolina, gas licuado de petróleo, gas natural u otros combustibles alternos. DOF: 26-11-2014.	Number 11	Non-accordance of standards	NOM-047-SEMARNAT-2014 establishes the equipment features and the measurement procedures for the verification of maximum emission limits of pollutants from automotive vehicles powered by gasoline, LPG, natural gas or other alternative fuels. It specifically states that it is not in line with international norms. It also states that no international reference existed at the time the NOM was written.	SCT, SE, SEMARNAT, Mexico City government, state governments, municipalities	A5	Access for foreign competitors to the Mexican market may be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	In Mexico, a non-harmonised NOM has to be disclosed, according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria. According to the *National Standardisation Programme 2018*, this NOM will be cancelled and replaced during 2018.	Update the NOM so that it is in accordance with international standards as far as possible. Certain current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if there currently exist international standards or best practices.
48	NOM-076-SEMARNAT-2012, Que	Number 6	Non-accordance of standards	NOM-076-SEMARNAT-2012 sets maximum emissions of unburned	SEMARNAT	A5	Access for foreign competitors to the Mexican market may	In Mexico, a non-harmonised NOM has to be disclosed,	Update the NOM so that it is as far as possible in accordance with international standards. Some

No.	Title of regulation	Article	Thematic category/ Keyword	Brief description of potential obstacles	Relevant authority	Toolkit question	Harm to competition	Policymakers' objectives	Recommendations
	establece los niveles máximos permisibles de emisión de hidrocarburos no quemados, monóxido de carbono y óxidos de nitrógeno provenientes del escape, así como de hidrocarburos evaporativos provenientes del sistema de combustible, que usan gasolina, gas licuado de petróleo, gas natural y otros combustibles alternos y que se utilizarán para la propulsión de vehículos automotores con peso bruto vehicular mayor de 3,857 kilogramos nuevos en planta. DOF: 27-11-2012.			hydrocarbons (HC), non-methane hydrocarbons (HCNM), carbon monoxide (CO), nitrogen oxide (NOx), and nitrogen oxide (NOx) from exhaust systems of new engines of vehicles with a gross weight of more than 3 857 kg that use gasoline, LPG, natural gas or other alternative fuels. It specifically states that it is not in line with international norms. However, the norm also states that regulation from the United States and the European Union was taken into account.			be hindered, as may be access for Mexican producers to foreign markets. In particular, producers might have to apply different sets of norms in Mexico and abroad, adding costs. Even in cases where Mexican standards have recently been (partially) adapted to international standards, if the full NOM's legal text is not in compliance with international standards, there might be confusion among market participants.	according to Article 41, letter VI of the Ley Federal Sobre Metrología y Normalización, which states that a NOM must declare its degree of accordance with international norms and criteria.	current practices may already be in accordance with international standards, which might ease the transition. It should be noted in the NOM if currently there are no existing international standards or best practices.

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