

# NATURAL GAS OUTLOOK

2017-2031



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## 2017-2031



**SENER**

SECRETARÍA DE ENERGÍA

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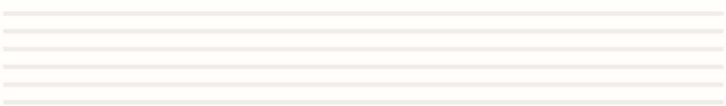
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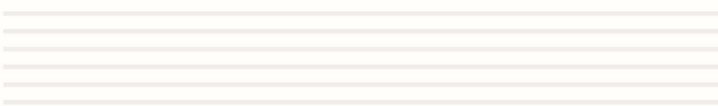


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## PRESENTATION

After the implementation of the Energy Reform in 2013, the energy sector in Mexico has undergone a process of transformation towards new frontiers of economic and technological development which has brought about significant achievements in the domestic natural gas market.

One of the main objectives of the current Administration is to develop an effective and sustainable energy industry which provides reliable, continuous, and competitive access to natural gas in all the national territory. Thereby, the Comprehensive Strategy for Natural Gas supply (EISGN, for its Spanish acronym) was implemented in 2013 to ensure the supply and promote the development of the national transportation network, fostering free competency, transparency, and the infrastructure expansion, as well as enable the participation of private parties and State Productive Enterprises (EPEs, for its Spanish acronym) on equal ground.

Between December 2012 and August 2017, 3,392 kilometers were added to the National Gas Pipeline Network, which represented an increase by 29%. This expansion comes along with a new legal framework designed for developing a more efficient market.

Thanks to the energy sector's new legal and regulatory frame it has been laid the foundations to establish mechanisms for coordinating the Secretariat of Energy (SENER, for its Spanish acronym) with the Coordinating Regulatory Organs in Energy Matter and the National Center for Natural Gas Control (CENAGAS, for its Spanish acronym).

With the participation of these organs, on June 2015, the SENER published the first version of the Quinquennial Tendering Plan for the Exploration and Extraction of Hydrocarbons 2015-2019, based on the technical proposal of the National Hydrocarbons Commission (CNH, for its Spanish acronym) and which considers diverse legal and public policy elements in order to give certainty and foster the activity within the hydrocarbons sector.

Besides, on October 2015, the SENER issued the Quinquennial Plan for the Expansion of the Natural Gas Transportation and Storage Integrated System, suggested by the CENAGAS, prior opinion of the Energy Regulatory Commission (CRE, for its Spanish acronym), which constitutes an indicative planning tool that evaluates more acutely the availability and demand of this fuel in the medium term; likewise, it brings certainty to projects on the infrastructure for natural gas transportation throughout the country, as well as elements for the decision making of private investors. To date, two annual reviews have been published of this Plan which aim to verify its validity in the face of the Natural Gas Market behavior and make the necessary adjustments to guarantee the effective development of the System.

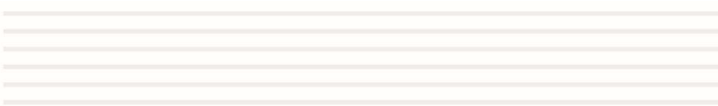
To the purpose of fostering the development of natural gas utilization, on July 25, 2016, the SENER presented the *Public Policy for the Implementation of the Natural Gas Market*, which lays the foundations for creating an efficient and competitive natural gas market that promotes investments and the entry of new participants.

The *Public Policy* is aligned with the *National Development Plan 2013-2018* to comply with the following objectives: (i) supply energy to the country at competitive prices, with quality and efficiency throughout the production chain, and (ii) guarantee clear rules that will incentivize the development of a competitive internal market.

To date, and to implement the Public Policy, the CENAGAS led the first Open Season 2016-2017 to reserve transportation capacity in the SISTRANGAS<sup>1</sup> and to foster the effective open access in this

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<sup>1</sup> National Comprehensive System for Transportation and Storage of Natural Gas.



System. The latter promoted competency in the trading activity and enable the entry of new players into the market, in the benefit of end users.

Once the market is opened, it is necessary to establish a policy for the country to have strategic and operative inventories which contribute to ensure the supply of natural gas. Thereby, on December 2017, the SENER made available to the natural gas industry the Public Policy in Energy Matter Applicable to the Constitution of Natural Gas Storage.

This Policy is part of the strategy designed by the SENER for developing a liquid market and thus safekeep the national interests and security, including energy security, sustainability, supply continuity, and the market's diversification.

Jointly, the indicative plans mentioned above constitute tools that enable the continuous expansion and triggering the potential of the country's energy sector, contributing thus to the economic development.



## INTRODUCTION

Natural gas has been progressively increased its use in the country, mainly for generating electricity. From the total demand of fossil fuels in the electricity sector during 2016, its share was of 70% as a result of the strategy for replacing high-cost and pollutant fuels, such as fuel oil and diesel, with cost-effective and environmentally friendly sources like natural gas.

Therefore, the current Administration has triggered new investment projects for the exploration and extraction of natural gas, and in such way, the country can increase its natural gas production capacity in the medium and long terms.

The document of Natural Gas Outlook 2017-2031 is an indicative planning tool which displays the behavior of the natural gas market, and thus contribute to the decision making in different sectors.

The document is integrated by three chapters that show the dynamic behavior, historical as well as prospective, of the supply and demand of this fuel within the country.

- Chapter One addresses the advances of the natural gas market in the legal and regulatory areas to which are subjected the Licensed activities within its value chain.
- Chapter Two describes the behavior of the natural-gas national market for the period 2006-2016, providing information about the natural gas reserves, historical production, sectorial demand, current prices, existing gas pipelines infrastructure, and foreign trade.
- The projections of supply, demand, and foreign trade of the natural-gas market for the next 15 years are included in Chapter Three, with a national itemization, regional and sectorial, taking into account the current relevant aspects of the energy public policy, such as development plans, the strategies implemented to take care of the supply, quinquennial tendering plans, of infrastructure expansion, as well as the agreements already established between the companies which nowadays are participating in the market.

# EXECUTIVE SUMMARY

## Chapter One. Natural Gas Regulatory Framework

The activities within the hydrocarbons value chain are regulated by the current legal and institutional framework of the Mexican energy sector and which is derived from the 2013 Energy Reform.

The new regulatory framework in hydrocarbons matter has led to a new energy model, more dynamic and based in the principles of competency, openness, open access, transparency, and sustainability, which brings about solid grounds to begin a new stage of development and wellness in the benefit of all Mexicans.

After the gradual opening of the hydrocarbons market, strategies have been established to foster the national and foreign investment throughout the value chain, promoting the direct participation of State Productive Enterprises (EPEs, for its Spanish acronym) on equal ground and fostering the association between Mexican and foreign enterprises, in order to ensure the continuous supply of energy in all the national territory.

In matter of Natural Gas, there have been significant advances; On July 2016 it was published the *Public Policy for the Implementation of the Natural Gas Market* which lay the foundations for creating an efficient and competitive natural gas market which fosters investments and the entry of new participants. On August 2014 was created the National Center for Natural Gas Control (CENAGAS, for its Spanish acronym); on March 2017 took place the second annual review of the Quinquennial Plan for the Expansion of the Natural Gas Transportation and Storage Integrated System 2015-2019, as well as the new strategy of the Quinquennial Tendering Plan for the Exploration and Extraction of Hydrocarbons 2019.

Jointly, the participation of the organisms involved in the matter and issuing of the indicative plans constitute tools which broaden and trigger the country's energy sector potential and contribute to the economic development.

## Chapter Two. Natural Gas Historical Market

In the last ten years, the national demand of fossil fuels has increased by 15.3%. In 2016 it reached a volume of 17,450.5 million cubic feet per day of natural gas equivalent (MMCFDNGE), 2.0% more regarding 2015.

From the national total demand of fossil fuels in 2016, natural gas had a share of 43.7% with a volume of 7,618.63 million cubic feet per day (MMCFD), and it increased during the last decade by 34% due to its increasing use as fuel for generating electricity through combined cycle technology.

In 2016, the electricity sector demanded 3,878.5 MMCFD, which represented a 2.05% increase regarding 2015. This sector has increased 62.3% during the last ten years.

By the end of 2016, the oil and industrial sectors recorded demand volumes of 2,122 MMCFD and 1,484 MMCFD, respectively.

The motor-carrier sector increased its NG demand by 16.6% regarding 2015 due to the increase in the vehicle fleet fueled by this hydrocarbon, while the residential sector presented a demand of 95 MMCFD.

The NG consumption in the services sector has recorded a gradual increase since 2006, due to the expansion of the infrastructure supplying this fuel.





To analyze the country's natural gas demand, it is divided into five consumption regions: Northwest, Northeast, Central-Western, Central, and South-Southeast. The Northeast region had the largest share in the national NG demand with 32.8% and a volume of 2,499.5 MMCFD, which represented 1.4% more regarding 2015. On the contrary, the Northwest region presented the smallest demand, reaching a volume of 608.1 MMCFD which represented an 8.0% share in the domestic total demand.

Regarding the NG remaining reserves in Mexico, these have decreased 53.5% due to the volatility of crude's price and the variations in the exchange and interest rates which put downward pressure on Pemex production.

To January 1<sup>st</sup>, 2017, the total remaining reserves of gas reached a volume of 28,950 MMCFD, 11.10% less regarding the previous year, distributed in 57% from onshore regions, 35.79% in shallow water regions, and 7.17% in deep water regions.

From the NG total reserves estimated to January 1<sup>st</sup>, 2017, 74% consider black oil fields, volatile oil, and free associated wet gas; 24%, to fields of non-associated wet gas, dry gas, and condensate; and 2% considers the gas reserves included in Round 1 which have not been classified by type of gas.

Regarding the NG domestic production, in 2016 it reached a volume of 5,811.4 MMCFD, 9.2% less regarding 2015.

The production of associated gas, by the end of 2016 averaged 4,545.5 MMCFD, 5.8% less regarding the previous year, mainly due to a smaller production from the Assets of the Southwest Marine and South regions. The volume of non-associated gas was of 1,266.0 MMCFD, 19.6% less to what was recorded in 2015.

Regarding foreign trade, by the end of 2016 imports recorded a volume of 4,168.1 MMCFD, an increase by 17.5% compared with the previous year.

From the imported total volume, 87.2% (3,632.6 MMCFD) entered the country through entry pipelines. The imports of liquefied natural gas had a 12.8% share, reaching a volume of 535.5 MMCFD, monthly average, which meant a decrease of 16% regarding the previous year.

As for the liberalization of NG prices, since June 17, 2017 the CRE eliminated the first-hand sales (FHS) maximum price of NG and established that natural gas FHS of the State productive enterprise, Pemex, will be subjected to the current market conditions.

Due to the latter, the CRE defined the convenience to elaborate and publish monthly national reference index of Wholesale Natural Gas Prices (INPGN), which reflects the prices of the transactions performed freely by the traders of the market.

The INPGN was approved by the CRE on August 17, 2017 and is published in pesos per gigajoule (MXN/GJ), and in dollars per million of British thermal units (USD/MBTU) in order to make it comparable with the international reference prices and international prices.

To continue with the implementation of the Comprehensive Strategy for Natural Gas Supply, issued on August 2013, the efforts are enhanced to ensure the natural gas supply through the expansion of the pipeline transportation network.

From December 1<sup>st</sup>, 2012 to August 2017, 3,392 km have been added to the pipeline national network, an increase by 29% regarding November 2012, with 14 new finished pipelines.

By the end of 2016, the CRE had 57 valid open-access transportation permits of natural gas by pipelines, from which 34 are operating and 23 in construction; these permits represent a total length of 18,994.4 km.

Regarding the NG distribution permits, by the end of 2016 the CRE accounted 23 with a cumulative length of 67,918 km and a coverage of 3.3 million users distributed throughout the country.

### Chapter Three. Natural Gas Prospective Market

In 2031 the NG demand is expected to increase by 26.8% regarding 2016, reaching a volume of 9,656.9 MMCFD. The demand will increase in most of the sectors, except for the oil sector, which decrease 24% regarding 2016; on the contrary, the electricity sector will have the largest share, 61.6%, of the total demand.

The electricity sector will have a demand of 7,244.2 MMCFDNGE of fossil fuels, which represents an increase of 25.6% regarding 2016; in this sector, NG will have an 82% share in the fuels total consumption, raising from 3,965.7 MMCFD in 2016 to 5,947.2 MMCFD in 2031, the result of implementing the infrastructure development of NG and the CFE strategy for replacing expensive and pollutant fuels for more efficient and sustainable ones such as NG, in addition to the modernizing of electric plants to dual combustion.

The industrial sector will reach a volume of 3,049.2 MMCFDNGE in 2031, which represents a reduction of 3.3% regarding 2016. It is estimated the chemical industry will become the largest consumer of NG with a share of 19.9%, a demand of 390.1 MMCFD. On the contrary, the industry of hydraulic cement will consume only 20.3 MMCFD, which represents a share of 1.0%.

The fuels demand in the oil sector to 2031 will reach a volume of 1,932.7 MMCFDNGE, a decrease of 31.0% regarding 2016; NG will remain as the most demanded fuel with a share of 80.0%

In the residential sector, the fuels demand will decrease 7.2% regarding 2016, falling from 1,164.3 MMCFDNGE to 1,080.3 MMCFDNGE in 2031. On the other hand, the NG demand will increase by 40.0%, raising from 94.8 MMCFD in 2016 to 132.8 MMCFD in 2031.

The services sector will reach a volume of 323.5 MMCFDNGE, a reduction of 3.3% regarding 2016, going from 1,164.3 MMCFDNGE to 1,080.3 MMCFDNGE in 2031, while the NG demand will be of 19.6%. The motor-carrier sector is expected to record a fossil fuels demand of 7,526.1 MMCFDNGE, which represents an increase of 26.0% regarding 2016; NG will participate with 0.1% of this sector's total demand.

As for the regional demand, the region with the largest NG consumption will be the Northeast, reaching a volume of 3,123.9 MMCFD, seconded by the South-Southeast region with 2,705.4 MMCFD, the Central-Western with 1,477.9 MMCFD, and finally, the Northwest and Central with 1,314.5 MMCFD and 1,038.2 MMCFD, respectively.

The NG production will come from the EPE and the tender winning companies. Two scenarios are estimated, a maximum and a minimum; the first one considers an extraction and exploration component of 3P reserves, and in the second, an extraction and exploration component of 2P.

The gas production in the maximum scenario is estimated to reach a volume of 6,244.0 MMCFD in 2031, 47.2% more regarding 2017; while in the minimum scenario, it is expected to reach a 4,044 MMCFD volume.

In 2031, the gas regional production in the maximum scenario will be distributed in onshore areas, deep water and shallow water, reaching volumes of 2,785.5 MMCFD, 1,759.3 MMCFD, and 1,699.0 MMCFD, respectively. As for the minimum scenario gas production in onshore areas, it will reach a volume of 809.1 MMCFD, in shallow water it is expected a volume of 1,623.7 MMCFD, and finally, the deep-water production will reach a 1,612.2 MMCFD volume in 2031.



Regarding the production of gas by origin, it is classified in associated and non-associated. The production of associated gas for the maximum scenario will reach a volume of 3,255.1 MMCFD, and of 3,111 MMCFD for the minimum scenario; in the case of non-associated gas, it is estimated to reach a 2,988.9 MMCFD in the maximum scenario and 934.0 MMCFD in the minimum.

Import levels will reach 4,613.6 MMCFD, an increase of 10.6% regarding 2016.

## CHAPTER ONE. NATURAL GAS REGULATORY FRAMEWORK

The Energy Reform has fostered the modernization of all the activities within value chain of the hydrocarbons industry through a new legal framework which allows the participation of private companies, whether individually or associated with the State Productive Enterprises (EPEs).

Under this new model, Petroleos Mexicanos (PEMEX) was modernized and strengthened, making it an EPE with budgetary and managerial autonomy, freedom for associating with the private sector to compete on equal ground. Additionally, the Coordinated Regulatory Organs in energy matter were strengthened by giving them technical, operational, and managerial autonomy in order to ensure the absolute transparency in agreements, permits, and tendering processes to guarantee the efficient functioning of the energy markets.

Jointly, this new organization of the hydrocarbons value chain has led to new frontiers of economic and technological development generating significant achievements in the Natural Gas (NG) domestic market, fostering free competency and the expansion of the infrastructure to ensure a secure, reliable, and low-cost supply throughout the national territory.

### 1.1 Advances of the Energy Reform in the Natural Gas Value Chain

Significant achievements in NG matter have been reached; on August 2014, the National Center for Natural Gas Control (CENAGAS, for its Spanish acronym), a decentralized organism of the Federal Public Administration sectorized to the SENER, and which is the manager and independent administrator of the National Comprehensive System for Transportation and Storage of Natural Gas<sup>2</sup> (SISTRANGAS, for its Spanish acronym) and is also in charge of the operation and maintenance of the transportation infrastructure from which is the title-holder. In addition, is the CENAGAS which suggests to the SENER, prior technical opinion of the CRE, the Quinquennial Plan for the expansion of SISTRANGAS. This plan will comprise, in addition to the indicative planning, social welfare projects and other projects which the SENER considers as strategic for guaranteeing the effective development of the System.

On July 2016, the Secretariat of Energy (SENER) published the *Public Policy for the Implementation of the Natural Gas Market*, which lay the foundations for creating an efficient and competitive natural gas market that fosters investments as well as the entry of new participants, promoting the access to information about the everyday transactions of NG performed by the traders<sup>3</sup>.

On March 2017, the SENER carried out the second review of the Quinquennial Plan for the Expansion of the Natural Gas Transportation and Storage Integrated System 2015-2019 with the technical assistance of the CRE and as suggested by the CENAGAS, whose purpose is to verify the validity of the Plan in the face of the NG market behavior and to make the necessary adjustments to guarantee the effective development of the SISTRANGAS<sup>4</sup> (see Figure 1.1).

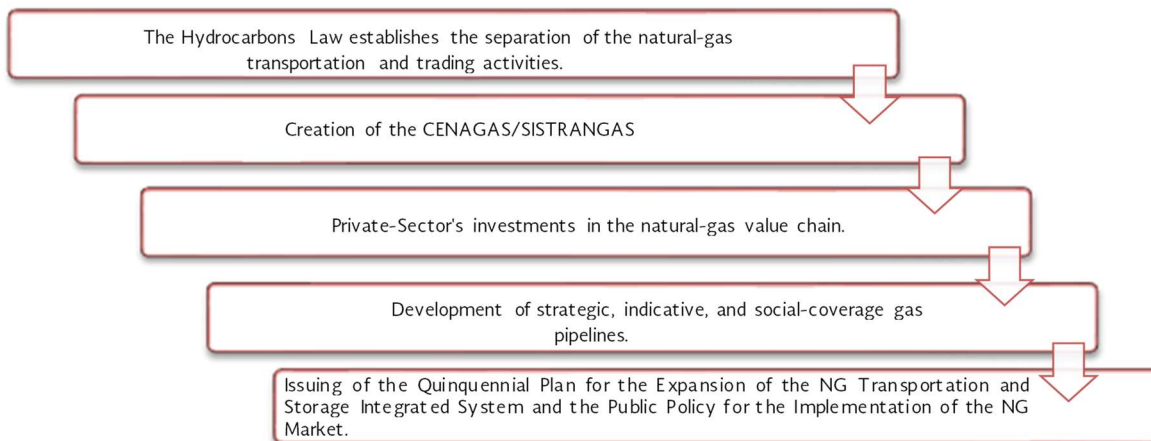
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<sup>2</sup> Article 69 of the Hydrocarbons Law.

<sup>3</sup> *Public Policy for the Implementation of the Natural Gas Market*

<sup>4</sup> Second Annual Review to the Quinquennial Plan for the National Comprehensive System for Transportation and Storage of Natural Gas 2015-2019.

**FIGURE 1. 1 ACTIONS OF THE NEW REGULATORY FRAMEWORK IN NATURAL GAS MATTER**



SOURCE: SENER with information from CRE.

Due to the modification of the NG regulatory framework has increased the competency thanks to the opening of the market which favors all the participants within the chain value. Besides, it has fostered the expansion of the infrastructure to transport NG through a pipelines network aimed to increase capacity and thus promote the effective development of the SISTRANGAS and of the private transportation networks, as well as of the fuel supply to the main consumption centers in the country<sup>5</sup>.

## 1.2 Regulatory Framework in Hydrocarbons Matter

The activities within the hydrocarbons value chain are regulated by a legal framework which establishes the laws and regulations that guarantee their operation under the best organizational terms.

Each organism involved plays a role in the sector to establish the applicable legislation in accordance with its attributions and faculties; likewise, they work jointly to lead the current public policy in hydrocarbons matter (see Figure 1.2).

<sup>5</sup> New Bulletin 039-SENER

**FIGURE 1.2 LEGAL FRAMEWORK IN HYDROCARBONS MATTER**



Source: SENER with information from CRE.



### 1.3 Regulatory Framework of the Energy Sector Outlooks

The Hydrocarbons Law establishes the SENER's faculty to lead the country's energy policy within the current constitutional framework; thereby, it works coordinately with the Coordinating Regulatory Organs in Energy Matter to act in accordance with the public policies established by the Federal Executive.

Pursuant of what is established in Article 33, Section V of the Organic Law of the Federal Public Administration (LOAPF, for its Spanish acronym), the SENER is in charge of the planning of the national energy sector; likewise the Interior Regulation of the Secretariat mentions in its article 24 Section XIV and XV the General Director of Planning and Energy Information is in charge of elaborating the project of the outlook document in the medium and long terms, with a 15-year planning horizon, and to become planning exercises for the next years, displaying a view of the market scenarios and being a supporting point for the country's strategic decisions.

### 1.4 Regulatory Organs in Energy Matter

The Coordinating Regulatory Organs in Energy Matter are:

- National Hydrocarbons Commission, and
- Energy Regulatory Commission

Both organisms have technical, operational, and managerial autonomy, as well as their own legal personality, and work coordinately with the SENER and other bodies of the energy sector<sup>6</sup>.

#### 1.4.1 Of the National Hydrocarbons Commission (CNH) faculties

The CNH, in addition to the attributions established in the Hydrocarbons Law, is in charge of regulating and supervising the activities of superficial reconnaissance and exploration, as well as the nation's hydrocarbons exploration and extraction; thereby, it is empowered to issue the regulation related to the country's oil potential, the recovery of crude oil, hydrocarbons reserves, utilization of NG related to the activities of exploration and extraction of hydrocarbons, among other activities associated to matters of its competency<sup>7</sup>.

#### 1.4.2 Of the Energy Regulatory Commission (CRE) faculties

According to the Law of the Coordinating Regulatory Organs in Energy Matter (LORCME), the CRE regulates and fosters the effective development of the following activities:

- Transportation, storage, distribution, compression, liquefaction, and regasification, as well as retailing of oil, natural gas, liquefied petroleum gas, oil products, and petrochemicals.
- Transportation by pipelines, storage, distribution, and retailing of biofuels.
- Electricity generation, electricity transmission and distribution public utilities which are not part of the electricity public utility and trading<sup>8</sup>.

<sup>6</sup> Article 2 and 3 of the Law of the Coordinating Regulatory Organs in Energy Matter.

<sup>7</sup> Article 38 of the Law of the Coordinating Regulatory Organs in Energy Matter.

<sup>8</sup> Article 41 of the Law of the Coordinating Regulatory Organs in Energy Matter.

## 1.5 Of the National Center for Natural Gas Control (CENAGAS)

The CENAGAS is the technical manager in NG matter and is a decentralized public organ of the Federal Public Administration, sectorized to the SENER and which plays two roles: the first one, as the SISTRANGAS manager, and the second as NG transporter, operating and maintaining its own pipelines.

As manager of the SISTRANGAS, the CENAGAS should carry out the Open Seasons for assigning the transportation capacity available in the system under principles of open access and not unduly discriminatory treatment, in order to increase competency within the market and number of users of the NG transportation by pipelines<sup>9</sup>.

Compliant with its purpose, the Center will have the following faculties:

- I. Operate, manage, and govern the System in the terms established by the Law and in the present Decree;
- II. Manage and administrate the storing pipelines and plants related to the NG Entry Pipelines interconnected to the System;
- III. Manage and administrate the available capacity in the agreements of capacity reservation of NG transportation and storage referred to in the Twelfth Transitory of the Law;
- IV. Provide the Transportation and Storing services in the infrastructure for which it holds the permit, according to what the Commission determines for such purpose.
- V. Operate and maintain, directly or through the divisions constituted for such purpose, the infrastructure of Transportation and Storage for which it holds the permits, compliant with the permit or permits issued by the Commission.
- VI. Perform or instruct the Permittees which are part of the System, to perform NG purchases and sales, only in cases of operational emergency, fortuitous event, or force majeure, or when it is mandatory for maintaining the balance and operation of the System, in accordance with the terms established by the Commission; Thursday, August 18, 2014 DOF (First Section);
- VII. Foster the development of the capacity secondary market of the System;
- VIII. Govern the daily balance of the System;
- IX. Suggest the Secretariat, for its approval and prior technical opinion of the Commission, the Quinquennial plan for the System's expansion;
- X. Put out to tender the strategic projects of NG transportation and storage infrastructure in the terms established in the Law, for which, if the case, will carry out the necessary procedures to reserve the capacity required by the System, according to the terms established by the Commission;
- XI. Define the capacity available in the System and allocate it under the terms approved by the Commission, according with the Law provisions, on equal ground for the interested users, for which it should keep updated an online information system which will contain the elements established by the Commission;

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<sup>9</sup> Article 69 and 122 of the Hydrocarbons Law.



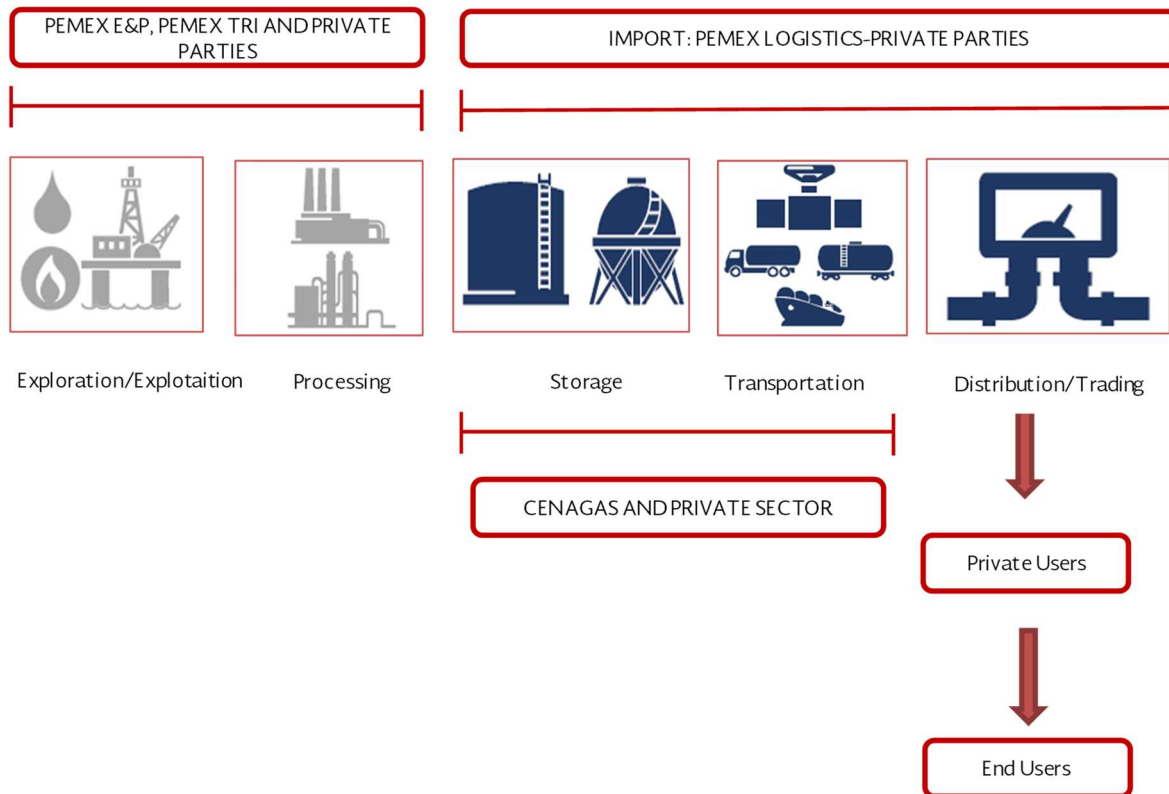


- XII. Govern the capacity available in the System in infrastructure not owned by it, with the purpose of verifying that it is made available of the interested users compliant with the terms established by the Commission;
- XIII. Supervise the Permittees and users of the System which carry out the necessary actions in the infrastructure subject of the permit or in its consumption facilities, to maintain the daily balance of NG required by such System;
- XIV. In the case of Critical Alerts, as well as fortuitous events or force majeure which affect the System's operation, implement the order of priority for the NG supply, compliant with the criteria established by the Commission;
- XV. Govern the legal acts and other necessary actions to let Permittees carry out the services provision in the System, under conditions which optimize the use of the infrastructure, as well as the effective and not unduly discriminatory open access;
- XVI. Carry out the daily management of the System to achieve the optima use of the group of facilities interconnected;
- XVII. Inform the Commission when the Permittees engage in practices which affect the appropriate and efficient operation of the System and act according to what is established by the Commission in the general conditions corresponding with the service provision.
- XVIII. Suggest, for the Commission's approval, the actions required to ensure the effective and not unduly discriminatory open access, and the continuity of the service in the System, so it has the necessary Transportation and Storage capacity;
- XIX. Suggest to the Commission recommendations for the issued regulation, to make all its activities as manager and Permittees appropriately retributed;
- XX. Carry out the processes of income compensation to the Permittees whose systems are part of the System, as well as to Permittees and other persons involved in the agreements whose management is under their charge;
- XXI. Contribute with the Secretariat in the elaboration of planning instruments in the medium and long terms in order to achieve the optimal and efficient development of the pipelines and storing systems; and
- XXII. The remaining established in the Law and its Regulation, the Organic Statute of the Center, as well as in other applicable legal ordeals.

## 1.6 Natural Gas Value Chain

The NG chain value involves different activities ranging from the exploration, extraction, and production of the hydrocarbon to its trading to the final user, passing through its processing, transportation, storage, and distribution<sup>10</sup> (see Figure 1.3).

**FIGURE 1. 3 NATURAL GAS VALUE CHAIN IN MEXICO**



Source: SENER with information from CRE and CENAGAS.

<sup>10</sup> Public Policy for the Implementation of the Natural Gas Market.



## 1.7 Natural Gas Exploration and Extraction

Prior to the Energy Reform, Mexico and its subsidiaries constituted the only industry in Mexico which could legally carry out the activities of exploration, extraction, and processing of NG, even if that meant to restrain the development of new hydrocarbons fields due to financial, operational, and technological limitations.

With the new legal framework in energy matter, the SENER published on June 2015 the first version of the Quinquennial Tendering Plan for the Exploration and Extraction of Hydrocarbons 2015-2019 and which was elaborated based on the CNH proposal. This Plan considers varied legal and public-policy elements needed for the tenders' feasibility.

The second review to the Quinquennial Plan took place in 2016 in order to follow up the strategy of nominating bidding areas to increase the Nation's capacity in exploration and extraction matter, in such way, it is intended to incentivize investments in the national hydrocarbons sector to increase the subsoil knowledge, the reserves' restitution rate, and the production levels of oil and gas. The latter, allowing the private sector along with PEMEX to explore, extract, and supply fuels providing the conditions for Mexico to open all the nominating areas in deep water, shallow water, non-conventional onshore, and conventional onshore, programming two bidding processes per year, according to its category<sup>11</sup>.

As it is an indicative document in which the effective execution of the tendering processes might vary according to what is established in the Plan, since September 2017, the SENER publishes the adaptations and updates to the Quinquennial Plan every month<sup>12</sup>.

### 1.7.1 Mexico's Rounds

The Hydrocarbons Law establishes the agreements for exploration and extraction can only be granted by CNH through a tendering process<sup>13</sup>, while the SENER establishes the contract model for each contractual area to be allocated, whether it is services, share production, or license type<sup>14</sup>.

Round Zero consisted in an allocation process through which the SENER, with the technical assistance of the CNH, determined the allocation of a balance portfolio of projects to PEMEX so the national company maintains the current production level during the next 20 years, establishing effective alliances with national or international oil companies to gather the necessary capital and technology to utilize the resources optimally<sup>15</sup>.

Rounds One and Two consist on public and competitive biddings to grant contracts for hydrocarbons exploration and extraction in national territory. According to the last evaluation to the Quinquennial Tendering Plan for the Exploration and Extraction of Hydrocarbons 2015-2019, it is estimated to utilize 579 contractual areas which sum up a 239,007.3 km<sup>2</sup> surface<sup>16</sup> for exploring and extracting hydrocarbons, from which during Round One, 20,456 km<sup>2</sup> were granted (see Table 1.1).

<sup>11</sup> Quinquennial Tendering Plan for Exploration and Extraction 2015-2018, Evaluation 2016, and New Strategy 2017.

<sup>12</sup> Quinquennial Tendering Program for the Exploration and Extraction of Hydrocarbons, September 2017.

<sup>13</sup> Article 15 of the Hydrocarbons Law.

<sup>14</sup> Article 18 of the Hydrocarbons Law.

<sup>15</sup> <https://www.gob.mx/sener/articulos/ronda-cero-y-migracion-de-contratos-de-pemex>.

<sup>16</sup> <https://www.gob.mx/sener/acciones-y-programas/plan-quinquenal-de-licitaciones-para-la-exploracion-y-extraccion-de-hidrocarburos-2015-2019-98261>

**TABLE 1. 1 SUMMARY OF ROUND ONE**

Round 1	Surface allocated km <sup>2</sup>	Location	Type of Agreement	Blocks Allocated	Blocks Put out to Tender	Official Verdict
1.1	659	Shallow water	Share Production	2	14	2015
1.2	165	Shallow water	Share Production	3	5	2015
1.3	778	Onshore zones	License	25	25	2015
1.4	18,818	Deep water	License	8	10	2016
<b>Total</b>	<b>20,420</b>			<b>38</b>	<b>54</b>	

Source: Sener with information from Mexico's Rounds of CNH.

Round Two allocated a surface of 11,462 km<sup>2</sup> (see Table 1.2).

**TABLE 1. 2 SUMMARY OF ROUND TWO**

Round 2	Surface allocated km <sup>2</sup>	Location	Type of Agreement	Blocks Allocated	Blocks Put out to Tender	Official Verdict
2.1	5,872	Shallow water	Share Production	10	15	2017
2.2	2,996	Onshore zones	License	7	10	2017
2.3	2,594	Onshore zones	License	14	14	2017
<b>Total</b>	<b>11,462</b>			<b>31</b>	<b>39</b>	

Source: Sener with information from Mexico's Rounds of CNH.

The first call for Round Three was published on September 29, 2017 in the Official Journal of the Federation (DOF, for its Spanish acronym) and looks forward to promoting the hydrocarbons marine sector based on the exploration and discovery of new resources which substitute the country's reserves, and which increase the production of oil and gas, consolidate comprehensive-developmental oil zones, and attract investment and quality-job creation.

The Call for tenders includes 35 areas for exploration and extraction in shallow water, located in the oil provinces of Burgos, Southeast Basins, and Tampico-Misantla-Veracruz, and tendered under the modality of shared production, and with a 26,265 km<sup>2</sup> surface. The tender is programmed by March 27, 2018.

## 1.8 Natural Gas Processing

Natural gas is a blend of gases mainly composed by methane, however, this blend is usually made of heavier hydrocarbons. Depending on its origin it is classified in associated gas and non-associated gas; the first one is extracted along with crude oil and contain amounts hydrocarbons heavier than methane; non-associated gas is found in deposits which do not contain crude oil.

NG processing entails a series of industrial processes where the hydrocarbon extracted from the subsoil is subjected to changes of pressure and temperature through sweetener, cryogenic, and cracking plants. The purpose of these processes is to obtain dry gas or commercial natural gas, and the order in the utilization of the processing plants will depend on the initial compounds of the hydrocarbon as extracted from the fields.

The new legal framework in energy matter establishes that the activity for processing NG requires a prior permit granted by the SENER<sup>17</sup>. Specifically, these permits are granted by the General Directorate of Natural Gas and Petrochemicals (DGGNP, for its Spanish acronym).

<sup>17</sup> Article 48 of the Hydrocarbons Law.



Nowadays, PEMEX is the only enterprise with natural-gas processing complexes in the country, eight of them located in the South-Southeast region (Chiapas, Tabasco, and Veracruz) and one in the Northeast region (Tamaulipas).

To date, PEMEX operates nine Natural-Gas Processing Centers (CPGs, for its Spanish acronym): (i) Cactus (Chiapas); (ii) Ciudad Pemex (Tabasco); (iii) Nuevo Pemex (Tabasco); (iv) La Venta (Tabasco); (v) Area Coatzacoalcos (Veracruz); (vi) Matapionche (Veracruz); (vii) Poza Rica (Veracruz); (viii) Arenque (Tamaulipas); and (ix) Burgos (Tamaulipas).

## 1.9 Natural Gas Transportation and Storage

Since January 1<sup>st</sup>, 2016, Pemex began the process for transferring its assets used for transporting NG to the CENAGAS. This corresponds to its duties as a NG transporter permittee in the systems: (i) National Pipelines System (SNG, for its Spanish acronym); and (ii) Naco-Hermosillo System (SNH, for its Spanish acronym)<sup>18</sup>.

Due to the latter, CENAGAS, in its transporter role, implemented a strategy to maintain and operate the infrastructure, and which monitors and establishes measures which mitigate or minimize risks in order to ensure the continuity and security in the provision of the services for which it is licensed and thus contribute to the efficient supply of NG in the national territory<sup>19</sup>.

On October 17, 2014, the CRE issued the Resolution RES/481/2014 which grants CENAGAS the Provisional Permit as Independent Manager of the SISTRANGAS. In this Resolution, the CRE states that for the Independent Manager to comply with its purpose, it should be understood that the formerly named National Integrated Transportation System (STNI, for its Spanish acronym) will now be the SISTRANGAS.

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<sup>18</sup> Resolution No. RES/182/2016

<sup>19</sup><https://www.gob.mx/cenagas/acciones-y-programas/proceso-de-contratacion-de-servicios-especializados-76054>

Based on the latter, the SISTRANGAS is formed by the following seven systems with the following characteristics:

#	System	Length (km)	Year of incorporation to the STNI* (now SISTRANGAS)
1	National Gas-Pipelines System (SNG)	8,867.00	N.A
2	Gas-Pipelines of Tamaulipas (GdT)	114.2	Sep-10
3	Gas-Pipelines of El Bajío	204.2	Aug-11
4	Northeastern Gas Pipelines (GdN or Ramones Phase I)	116.4	Dec-13
5	Northwestern Natura Gas (GdN)	172.5	Jun-14
6	TAG Pipelines North (TPN)	446.8	Dec-14
7	TAG Pipelines South (TPS)	291.5	Dec-14
<b>Total Length of the integrated systems</b>		<b>10,212.60</b>	

\* National Integrated Transportation System  
Source: SENER with information from CENAGAS.

FIGURE 1. 4 CONSTITUTION OF THE SISTRANGAS, 2016



Source: CENAGAS.



Nowadays, the SISTRANGAS covers 21 states of the Mexican Republic, which means the CENAGAS is not the Technical Manager of the whole pipelines network of the country, since the system is so heterogenic that it has pipelines with a large diameter (48") and a moderate diameter (4").

During 2015, the CENAGAS in its role as the SISTRANGAS Technical Manager suggested to the SENER the Quinquennial Plan for the Expansion of the SISTRANGAS 2015-2019, which in addition of containing the indicative planning, also contains social-welfare projects to be developed, and projects which the SENER considers strategic to ensure the efficient development of this System.

According with Article 66 of the Regulation of the activities referred to in Title Third of the Hydrocarbons Law (Regulation), each year the SENER reviews the Quinquennial Plan to verify its validity in the face of the NG market behavior and to make the necessary adjustments to ensure the effective development of the System.

Regarding the NG Storage, once the market is opened, it is necessary to establish a policy, so the country can have strategic and operational inventories which contribute to guarantee the NG supply. Thereby, on December 14, the SENER provided the NG industry and the general public with the *Public Policy in Energy Matter Applicable to the Constitution of the Natural Gas Storage*.

This policy is part of the strategy designed by the SENER for developing a liquid market that will safekeep the national interests and security, including energy security, sustainability, the continuity of the supply, and the market diversification.

To this regard, the CENAGAS carries out the *Study of the Natural Gas Underground Storage Potential for the Utilization of the SISTRANGAS*, which is focused on identifying the hydrocarbons fields with potential for modernizing NG underground storage units. Once this study is finished, the CENAGAS will be able to suggest to the SENER strategic NG storage projects during the next annual review exercise of the Quinquennial Plan<sup>20</sup>.

On the other hand, the LNG (liquefied natural gas) regasification terminals serve as storage permittees. To date, the LNG Storage and Regasification Terminals (TARGNL, for its Spanish acronym) of Altamira and Manzanillo are interconnected to the SISTRANGAS, however, their storage capacity is total reserved to the EPEs and private companies.

It is worth mentioning the TARGNL of Altamira and Manzanillo have are not integrated in their tariffs to the SISTRANGAS, nonetheless, they represent a supplying option for traders and users as injection points to the System.

In this sense, CENAGAS could reserve capacity in both Terminals for having operational storage to be used in the SISTRANGAS, as long as there are the contractual conditions for this organism, in its role as Technical Manager, to use this storage and regasification capacity in the moments when it is required to inject LNG as a method of hydraulic balancing. The latter, in force majeure cases, as in August 2017, during the affectations of Harvey in Western Texas which blocked the import of NG through pipelines in the area of Reynosa for nearly 3 days.

The practices of capacity reservation were implemented to achieve the development of a competitive NG market for the users of SISTRANGAS in terms of not unduly discriminatory open access. To carry out this strategy, the CENAGAS executed an Open Season to allocate the system's transportation capacity.

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<sup>20</sup> 2nd. Annual Review of the Quinquennial Plan for the Expansion of the Natural Gas Transportation and Storage Integrated System.

## 1.10 Capacity Reservation and Effective Open Access

According to with what is established in Chapter I Title Third of the Hydrocarbons Law and Chapters IV, V, and VI of the Regulation of the activities referred to in Title Third of the Hydrocarbons Law, the execution of the activities of NG transportation and storage require a permit formerly granted by the CRE. The permittees who provide transportation service by pipeline are obliged to grant open access not unduly discriminatory to its facilities and services, formerly subjected to their systems capacity availability.

Open and not unduly discriminatory access is understood as when the Permittees are obliged to provide the service of NG transportation and storage in similar conditions to users of similar characteristics. And, if new agents demand the service, the permittee is obliged to provide it if capacity is available. Available capacity is understood as the amount of capacity resulting from the difference between the operational capacity and the capacity reserved by the permittee for its own uses and the one engaged by arrangements for service provision. Likewise, it can also be the capacity which, being engaged in a firm base agreement, it is not used by the respective users and can be used for providing services in uninterrupted or firm basis (allocated through a process of Open Season, if the capacity liberation is permanent)<sup>21</sup>.

The effective open access and the capacity reservation enables the efficient allocation of the NG transportation infrastructure; besides, these provisions enable the visualization of opportunities for constructing new infrastructure.

The CENAGAS is able to manage and govern the SISTRANGAS available capacity. Thereby, during 2017 the CENAGAS, as Technical Manager of the SISTRANGAS, carried out the first process of Open Season in this Transportation System, which was formed by two phases: Round EPE and Open Season.

### Round State Productive Enterprises (EPEs)

It was the process used to determine the capacity to be reserved by the EPEs, its subsidiary organisms, and the enterprises with direct or indirect participation for their industrial transformation operations, in the case of PEMEX, and for its electricity generating operation in the case of CFE<sup>22</sup>. This capacity was determined based on the historical consumptions of these EPEs.

### Round Open Season

The Open Season procedure 2016-2019 was approved by the CRE to incentivize the interest in the NG transportation market and thus, increase its competitiveness for the benefit of end users<sup>23</sup>. The results of this first open season were published on May 2017, where the CENAGAS allocated 2,346,021 GJ/day the different segments of the system; this capacity was added to what was previously allocated to the EPEs and their preexisting agreements<sup>24</sup>.

As part of the Energy Reform implementation, one of the greatest achievements of the Technical Manager was to begin the transportation-capacity reservation regime on firm base within the SISTRANGAS.

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<sup>21</sup> RES/900/2015

<sup>22</sup> RES/968/2016.

<sup>23</sup> RES/1037/2016.

<sup>24</sup><https://www.gob.mx/cenagas/prensa/adjudica-el-cenagas-2-346-021-gj-d-en-la-primera-temporada-abierta-del-sistrangas>





Through this scheme, the Technical Manager guarantees the effective and not unduly discriminatory open access, the continuity and security in providing the SISTRANGAS services. The latter, to contribute with the supply of NG provision in the national territory.

Based on the capacity allocated during the exercise of the Open Season 2016-2017, as well as the exercises prior to Round EPE and Acquired Rights, the Technical Manager subscribed 50 agreements for NG transportation in firm base with SISTRANGAS users (shippers), for a maximum daily capacity of 6,285,962 GJ/day, equivalent to 5,512 million cubic feet per day (MMCFD)<sup>25</sup>.

On the other hand, the participants which obtained allocated capacity in the open season had the opportunity to interchange segments and extraction points subjected to the confirmation of feasibility from CENAGAS; this process is called swaps periods or capacity reservation<sup>26</sup>.

### **1.11 Auction for Managing and Governing the Available Capacity in Entry Pipelines**

Entry pipelines are the infrastructure whose capacity is destined mainly to connect the country with transportation or open-access storage infrastructure used to import natural gas<sup>27</sup>.

The first annual auction of available capacity in entry pipelines was carried out on February 17, 2017 by the CENAGAS, where 29.2% of the capacity available in entry pipelines was allocated, and which will enable the generation of larger investments due to the entry of new actors into the gas market.

Three companies won 220,741 MMBtu/d (from an available total of 753,722 MMBtu/d) in four segments of the transportation system NET Mexico Pipeline, which is interconnected to the SISTRANGAS in the border compression station (Camargo) and supplies NG from Agua Dulce (Texas) to the Pipelines National System and to the Transportation System Los Ramones<sup>28</sup>.

On July, August, and September 2017 seven auctions of available capacity in entry pipelines were carried out by CFE International, LLC, which were declared null and void since none of the trading companies subscribed in the CENAGAS Electronic Board submitted proposals.

### **1.12 Natural Gas Trade**

Establishing the separation of the NG transportation and trading activities has been a significant achievement in matters of NG trade after the Reform, this means that permittees of NG transportation by pipelines cannot trade with the hydrocarbon<sup>29</sup>.

On the other hand, in matters of NG trading, the Hydrocarbons Law established the CRE will subject to asymmetric regulation the trading activities of Pemex in order to limit its domaining power and to achieve a larger participation of economic agents which foster the efficient and competitive development of the markets.

<sup>25</sup> Using the following conversion factors: (i) 1 GJ = 0.9478 million British thermal units (MMBTU), and (ii) 1,080 MMBTU = 1 MMpc of natural gas.

<sup>26</sup> <https://www.gob.mx/cenagas/acciones-y-programas/periodo-swaps-de-reserva-de-capacidad>.

<sup>27</sup> Article 4 of the Hydrocarbons Law.

<sup>28</sup> <https://www.gob.mx/cenagas/prensa/cenagas-adjudico-el-29-2-de-la-capacidad-disponible-en-ductos-de-internacion-como-resultado-de-la-1a-subasta-anual-en-ductos-de-internacion>.

<sup>29</sup> Public Policy for the Implementation of the Natural Gas Market.

As part of the asymmetric regulation, the CRE subjected PEMEX to instrumenting a Program of Gradual Cession of Agreements<sup>30</sup> which establishes that, within an interval of maximum four years, starting after its authorization, Pemex should make available to third-party traders the cession of the 70% of the total volume of natural gas related to its current NG trading activities of its contract portfolio.

### **1.13 Liberalization of the Natural Gas Price**

The implementation of the NG public policy lay the foundations to constitute an efficient and competitive market which fosters investments and the entry of new participants into the market; such policy is aligned with the National Development Plan 2013-2018 and establishes that during 2017 the CRE can eliminate the formula for the First-Hand Sales (FHS) prices and authorizes Pemex the sale of NG at the price fixed by the market, except for the South zone until this zone can attain the participation of economic agents which foster the efficient and competitive development of the zone, and in the short term (2018), the CRE can eliminate the FHS-price formula throughout the country<sup>31</sup>.

Based on the latter, on June 2017 the CRE agreed to nullify the methodology for defining the NG maximum prices subjected to FHS, approved by the resolution RES/998/2015; the decision to allow that natural-gas FHS prices at national level are defined under market conditions seeks to favor free competency between the different economic agents involved in the energy supply of each region, the development and optimization of the infrastructure related to supply, and the election of the users for a more efficient energy supply according to their needs.

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<sup>30</sup> RES/997/2015.

<sup>31</sup> Agreement of the CRE which nullifies the methodology to determine the maximum prices of NG subjected to FHS, approved through the resolution RES/998/2015, and eliminates the maximum price of NG subjected to FHS so it is determined under free-market conditions.



**TABLE 1. 3 AGREEMENTS AND RESOLUTIONS PUBLISHED IN THE OFFICIAL JOURNAL OF THE FEDERATION IN NATURAL GAS MATTERS (2016-2017).**

<p><b>A/009/2017</b> Agreement of the Energy Regulatory Commission which provides technical opinion about the second annual review of the quinquennial plan for the expansion of the natural gas transportation and storage integrated system for the period periodo 2015-2019.</p>
<p><b>A/010/2017</b> Agreement whereby is issued the opinion to the Cenagas about the capacity assignation of the capacity in the injection points for the users with acquired rights within the open-season procedure in the natural gas transportation and storage integrated system.</p>
<p><b>A/026/2017</b> Agreement of the Energy Regulatory Commission which nullifies the methodology for fixing the maximum prices of natural gas subjected to FHS, approved through the Resolution RES/998/2015, and eliminats the maximum price of natural gas subjected to FHS so it would be fixed under free-market conditions.</p>
<p><b>RES/050/2017</b> Resolution which approves to Cenagas the tariffs for the natural gas transportation and storage integrated system applicable for the period January 1st-December 31st, 2017.</p>
<p><b>RES/101/2017</b> Resolution whereby is approved to Pemex Industrial Transformation the amendment to the general terms and conditions for natural gas FHS, approved and issued through the Resolution RES/996/2015.</p>
<p><b>RES/749/2017</b> Resolution whereby la Energy Regulatory Commission determines the geographical zone of Tabasco, state of Tabasco, for purposes of natural-gas distribution.</p>
<p><b>RES/625/2017</b> Resolution whereby la Energy Regulatory Commission updates the values of the parameters, in terms of the provisions 5 and 6 of the Single Annex of the Resolution RES/998/2015 and through the CRE issues the methodology for fixing the maximum prices of natural gas subjected to FHS.</p>
<p><b>A/26/2017</b> Agreement of the Energy Regulatory Commission which nullifies the methodology for fixing the maximum prices of natural gas subjected to FHS, approved through the Resolution RES/998/2015, and eliminates the maximum price of natural gas subjected to FHS so it would be fixed under free-market conditions</p>
<p><b>DOF 07/01/2016</b> Technical Provisions for the use of associated natural gas in the exploration and extraction of hydrocarbons.</p>
<p><b>DOF 21/04/2016</b> Guidelines which regulate the procedure to submit, approve, and supervise the compliance with the plans of Exploration and development for Hydrocarbons Extraction, as well as its amendments.</p>
<p><b>DOF 02/08/2016</b> Technical Guidelines in Hydrocarbons matter</p>
<p><b>DOF 15/04/2016</b> Guidelines which regulate the procedure of quantification and certification of the Nation's reserves and the report of the contingent related resources.</p>
<p><b>RES/968/2016</b> Resolution of the Energy Regulatory Commission which determines the transportation capacity by pipeline that the State Productive Enterprises, their subsidiary organisms, and the companies where the first ones have a direct or indirect share can reserve capacity in the SISTRANGAS for their electricity-generation activities and hydrocarbons industrial transformation, accordingly, compliant with what is established in Article Twelfth Transitory of the Hydrocarbons Law.</p>
<p><b>RES/1037/2016</b> Resolution of the Energy Regulatory Commission whereby it approved the CENAGAS the proposal for the open-season procedure of the SISTRANGAS.</p>
<p><b>RES/1381/2016</b> Resolution of the Energy Regulatory Commission which authorizes CENAGAS to modify the program of events included in the Annex 6 of the Resolution RES/1037/2016 which approved the open-season procedure of the SISTRANGAS.</p>

Source: SENER with information from CRE.

## CHAPTER TWO. NATURAL GAS HISTORICAL MARKET

According to the current legal framework in natural-gas matter, the SENER is in charge of defining the strategy to implement a competitive and sustainable Natural Gas Market.

Thereby, the current actions are aimed to enable the transition towards the opening of the NG market. To such purpose, it is necessary to provide this market relevant, timely, and accurate information for decision making. To date, all the permittees for NG transportation are obliged to publish their systems available capacity through electronic bulletins and every other relevant information about their permit<sup>32</sup>.

In addition, on January 2018 the CENAGAS will publish the SISTRANGAS electronic bulletin with information about the transportation effective capacity utilized and available, per injection point in this system, among other relevant information.

### 2.1 Historical Domestic Demand of Natural Gas

In the last decade, the domestic natural gas demand has increased by 34.3% (see Figure 2.1), mainly due to the expansion of electricity generation using this fuel in combined-cycle plants. This technology is more efficient and sustainable compared with electricity plants fueled by other fossil fuels since they generate less CO<sub>2</sub> emissions and bring high yields of the energy contained in this fuel (about 60%) and NG is a low-cost fuel.

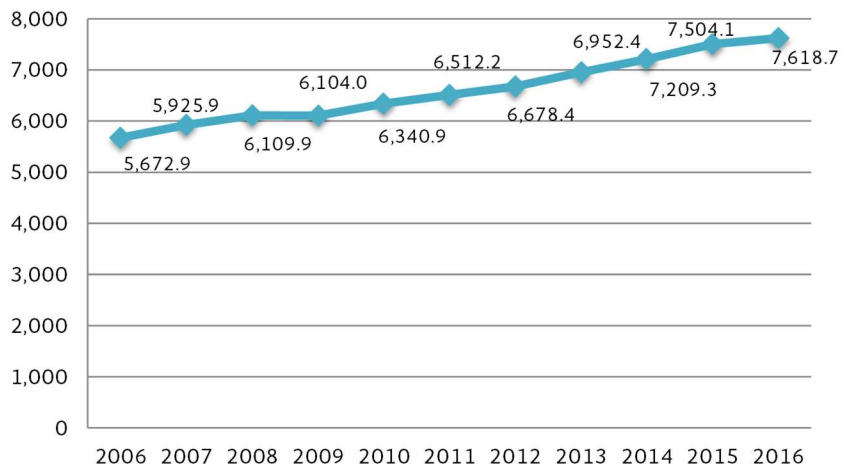
On the other hand, the oil and industrial sectors have a considerable share in the domestic NG demand, while the residential, services, and motor-carrier sectors have gradually increased their demand and in synchronization with the development of the domestic infrastructure of this fuel.

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<sup>32</sup> Chapter IV of the Hydrocarbons Law, related to open access.



**FIGURE 2. 1 HISTORICAL DOMESTIC NATURAL GAS DEMAND\***  
(MMCFD)



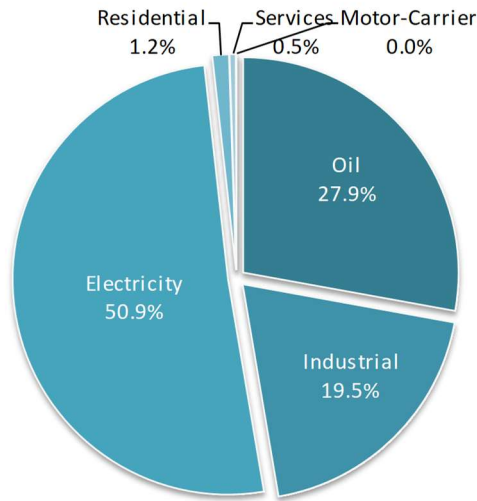
Note: For the historical and prospective demands it considers an annual average.  
Source: SENER with information from IMP.

## 2.2 Domestic Natural Gas Demand by Sector

In 2016 the domestic NG demand recorded a volume of 7,618.7 MMCFD, 1.5% more regarding the previous year.

- The electricity sector is the largest demand of NG in the country; by the end of 2016 it recorded a share of 50.9% (see Figure 2.2).

**FIGURE 2. 2 NG DOMESTIC DEMAND BY SECTOR, 2016**  
(Percentage)

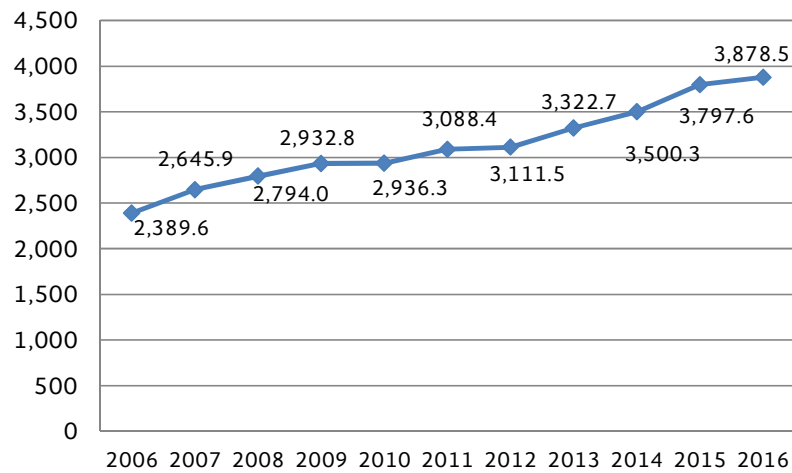


Source: SENER with information from IMP.

## Electricity Sector

In the last decade, this sector's NG demand has increased by 62.3%, going from 2,389.6 MMCFD in 2006 to 3,878.5 MMCFD in 2016, given that CFE has implemented a strategy to reduce the use of expensive and pollutant fuels (such as fuel oil and diesel) and replace them with lower cost and environmentally-friendly fuels (such as natural gas), for their electricity-generation processes<sup>33</sup> (see Figure 2.3).

**FIGURE 2. 3 HISTORICAL NATURAL GAS DEMAND IN THE ELECTRICITY SECTOR, 2006-2016**  
(MMCFD)



Source: SENER with information from IMP.

<sup>33</sup> Annual Report CFE 2015, p. 8.



Between 2014 and 2016, the CFE upgraded seven thermal-electric stations to dual combustion; these stations can generate electricity using fuel oil as well as natural gas whose price and pollutant emissions are lower, and it helps extend the stations' lifespan<sup>34</sup>.

In total, the following seven stations represent more than 4,500 Megawatts (MW) of installed capacity and an investment of approximately 2,837 million pesos MXN.

- 1) Puerto Libertad in Sonora (632 MW)
- 2) Juan de Dios Paredes in Sinaloa (320 MW)
- 3) Emilio Portes Gil in Tamaulipas (300 MW)
- 4) Villa de Reyes in San Luis Potosi (700 MW)
- 5) Jose Aceves Pozos in Sinaloa (300 MW)
- 6) Manuel Alvarez Moreno in Colima (700 MW)
- 7) Francisco Perez Rios in Hidalgo (1,600 MW)

Additionally, to December 2016 the CFE has fostered the construction of nine combined-cycle generation which represent an additional joint capacity of 6,137.20 MW and an investment of 3,516.70 million dollars under schemes of IEP (Independent Energy Producers) and PFW (Public Finance Works), (see Table 3.1)<sup>35</sup>.

**TABLE 2. 1 COMBINED-CYCLE GENERATING STATIONS IN CONSTRUCTION**

#	Name of the power station/Location	Scheme	Type	Capacity (MW)	Investment (million USD)	Startup	Advance 2016 (%)
1	Baja California III Ensenada, Baja California	IPP	Combined cycle	294	215.6	ene-17	99.2
2	Cogeneración Salamanca Salamanca, Guanajuato	FPW	Combined cycle	373.1	319.9	mar-17	99.9
3	Centro I Yecapixtla, Morelos	FPW	Combined cycle	642.3	439.8	abr-17	99.2
4	Empalme I Empalme Sonora	FPW	Combined cycle	770.2	476.8	nov-17	76.8
5	Valle de México II Acolman, Edo de México	FPW	Combined cycle	615.2	425.3	ene-18	44.2
6	Empalme II Empalme, Sonora	FPW	Combined cycle	791.2	397	abr-18	38.6
7	Noreste El Carmen, Nuevo León	IPP	Combined cycle	857.2	345.5	jul-18	25.8
8	Northwest Ahome, Sinaloa	IPP	Combined cycle	887.3	334.4	ene-19	8.2
9	Norte III Cd. Juárez, Chihuahua	IPP	Combined cycle	906.7	562.4	jun-19	33
<b>Total</b>				<b>6,137.20</b>	<b>3,516.70</b>		

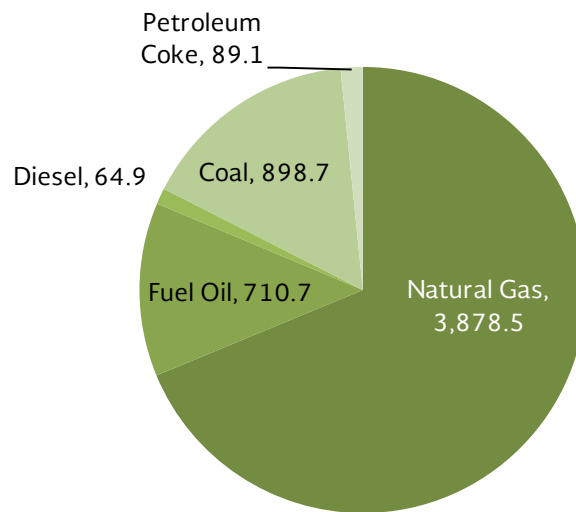
Source: SENER with information from CFE.

<sup>34</sup> Ibidem, p. 33.

<sup>35</sup> Ibidem, p. 55.

- By the end of 2016, this sector’s fossil fuels demand was of 5,641.9 million cubic feet of natural gas equivalent (MMCFDNGE), 2.6% more than 2015 (see Figure 2.4).
- In order of importance, 68.7% of the consumption was of NG; 15.9%, coal; 12.6%, fuel oil; and finally, petroleum coke and diesel with 1.6% and 1.1%, respectively.
- Regarding the NG demand, it increased by 2.05% in 2016 regarding the previous year, reaching a volume of 3,878.5 MMCFD.

**FIGURE 2. 4 FUELS DOMESTIC DEMAND DEL ELECTRICITY SECTOR, 2016**  
(MMCFDNGE)



Source: SENER with information from IMP.

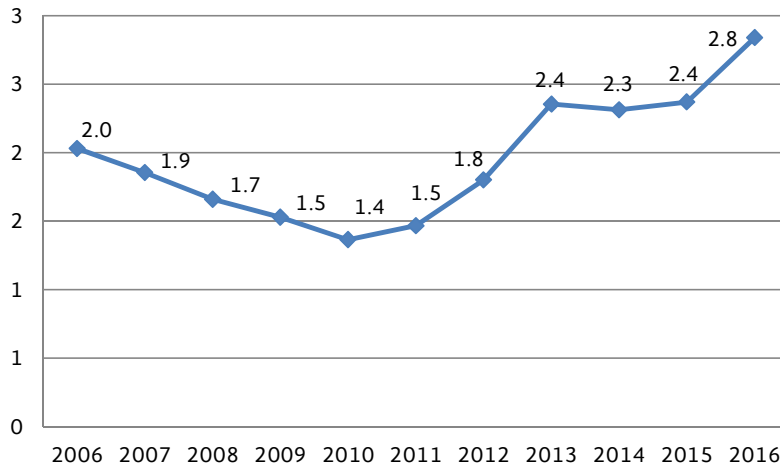
### Motor-Carrier Sector

- In the last decade, this sector’s NG demand has increased by 40% due to the 15.2% increase in the vehicle fleet using this fuel (see Figure 2.5).
- During 2016, the domestic fossil-fuels demand in this sector averaged 5,975.23 MMCFDNGE, 2.8% more than in 2015. Compressed natural gas recorded a demand of 2.8 MMCFD, 16.6% more regarding 2015 (see Figure 2.6).



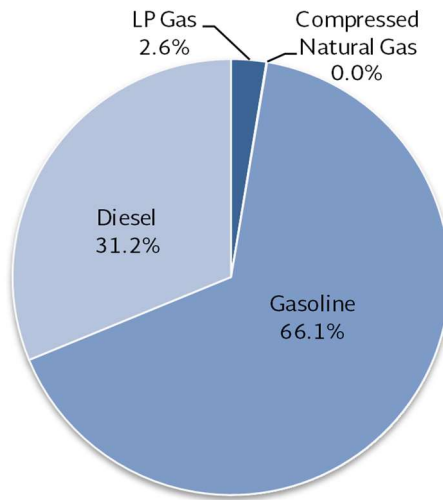


**FIGURE 2. 5 HISTORICAL COMPRESSED NATURAL GAS DEMAND IN THE MOTOR-CARRIER SECTOR (MMCFD)**



Source: SENER with information from IMP.

**FIGURE 2. 6 FUELS DOMESTIC DEMAND IN THE MOTOR-CARRIER SECTOR, 2016**



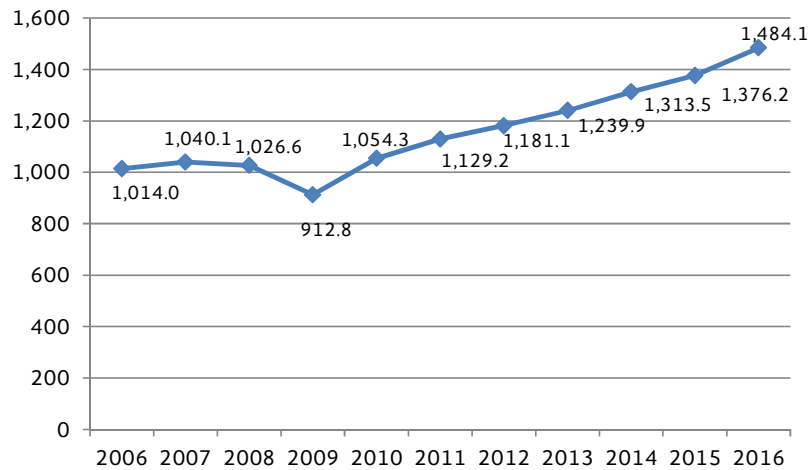
Source: SENER with information from IMP.

## Industrial Sector

The NG demand in the industrial sector has increased by 46.3% in the last ten years, going from 1,014 MMCFD in 2006 to 1,484.1 MMCFD in 2016 (see Figure 2.7).

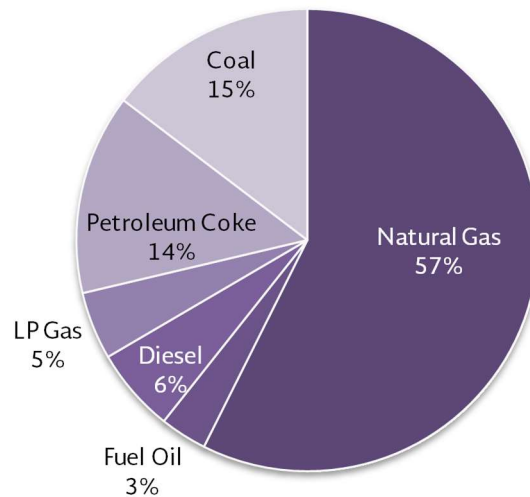
- In 2016, this sector's fossil-fuels demand was of 2,586.0 MMCFDNGE, 6.8% more regarding the previous year (see Figure 2.8).
- It demanded 1,484.1 MMCFD of natural gas, 7.8% more than in 2015.

**FIGURE 2. 7 HISTORICAL NATURAL GAS DEMAND IN THE INDUSTRIAL SECTOR**  
(MMCFD)



Source: SENER with information from IMP.

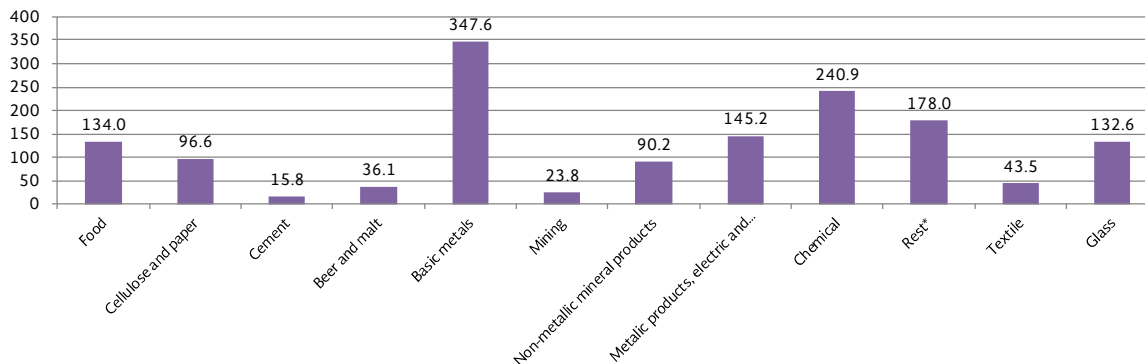
**FIGURE 2. 8 FUELS DEMAND IN THE INDUSTRIAL SECTOR, 2016**  
(Percentage)



Source: SENER with information from IMP.

- The branches of the industrial sector with the largest fuels consumption were the basic metals industry and the chemical industry (see Figure 2.9).

**FIGURE 2.9 NG DOMESTIC CONSUMPTION OF THE INDUSTRIAL SECTOR, 2016**  
(MMCFD)



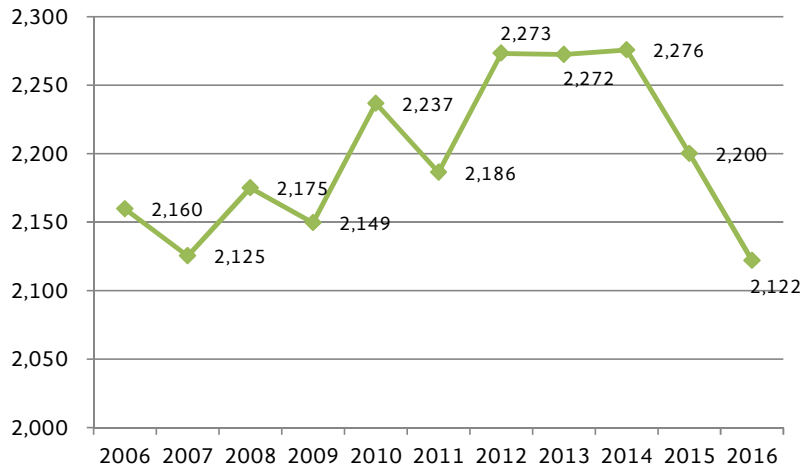
\*The classification "rest" includes: agriculture, animals breeding and exploitation, forest utilization, fishing, construction, wood industry, and furniture, mattress, and blinds manufacturing.  
Source: SENER with information from IMP.

## Oil Sector

The oil sector has decreased in 1.7% its NG consumption during the last decade, going from 2,160 MMCFD in 2006 to 2,122 MMCFD in 2016 (see Figure 2.10).

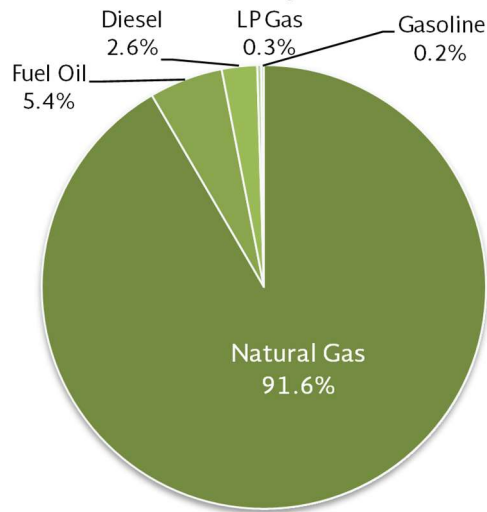
- In 2016, PEMEX fuels demand was of 2,316.8 MMCFDNGE, 6.6% less than the previous year (see Figure 2.11).
- NG recorded a demand of 2,122 MMCFD, 3.5% less regarding 2015 (see Figure 2.12).

**FIGURE 2. 10 HISTORICAL NATURAL GAS DEMAND IN THE OIL SECTOR, 2016**  
(MMCFD)



Source: SENER with information from IMP.

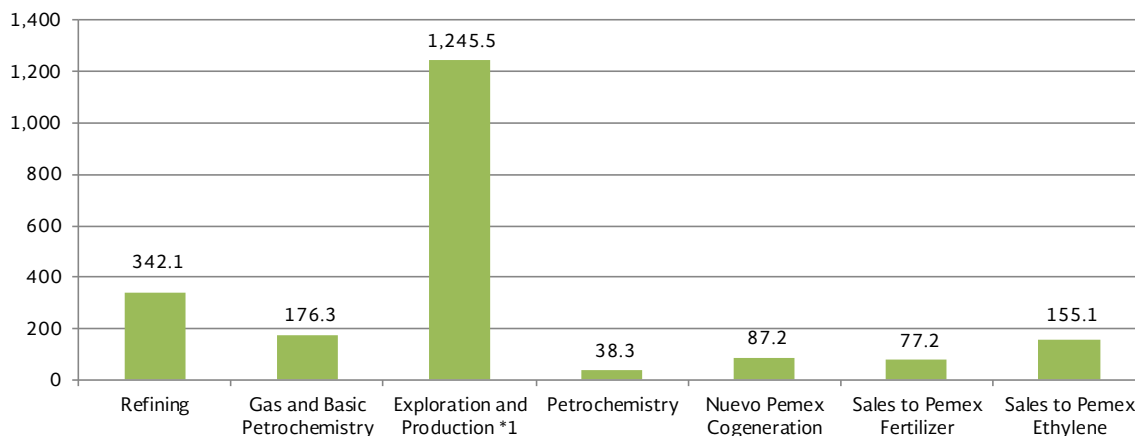
**FIGURE 2. 11 DOMESTIC FOSSIL-FUELS DEMAND IN THE OIL SECTOR, 2016**  
(Percentage)



Source: SENER with information from IMP.



**FIGURE 2. 12 NG CONSUMPTION IN THE OIL SECTOR, 2016**  
(MMCFD)

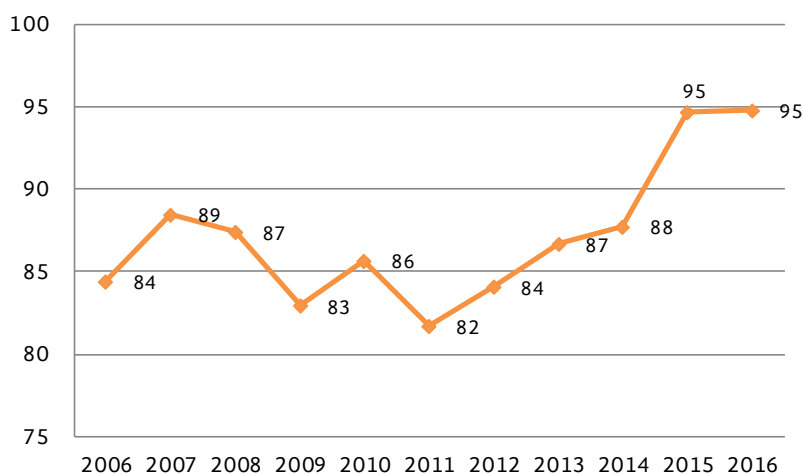


\*1 Includes the consumption of the Cantarell's Nitrogen Company.  
Source: SENER with information from IMP.

## Residential Sector

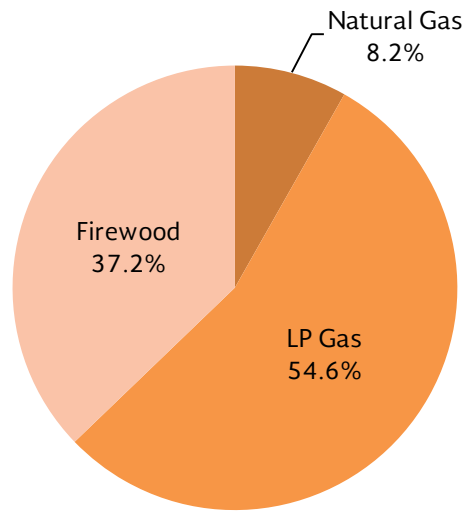
- In the last ten years the residential sector's NG demand has increased 12%, recording a 94.8 MMCFD demand in 2016 (see Figure 2.13).
- In 2016, the residential sector's fuels demand recorded a volume of 1,158.1 MMCFDNGE; natural gas had a share of 8.2% (see Figure 2.14).

**FIGURE 2. 13 HISTORICAL NATURAL GAS DEMAND IN THE RESIDENTIAL SECTOR**  
(MMCFD)



Source: SENER with information from IMP.

**FIGURE 2. 14 DOMESTIC FUELS DEMAND IN THE RESIDENTIAL SECTOR, 2016**  
(Percentage)



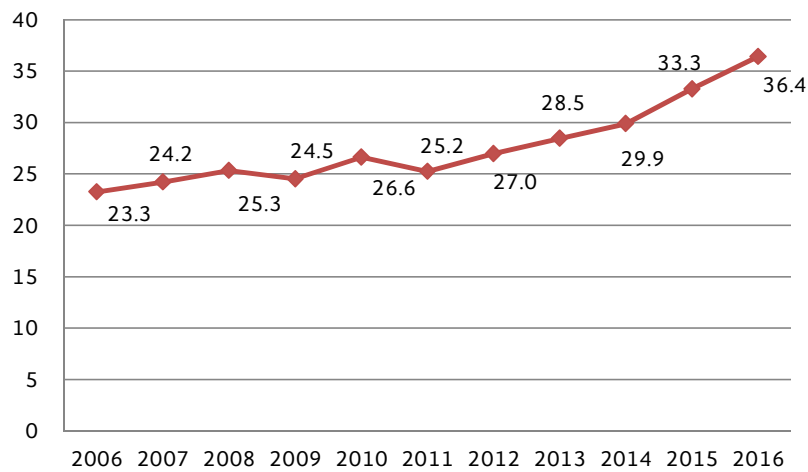
Source: SENER with information from IMP.

## Services Sector

In the last ten years, the services sector’s natural gas demand has increased 56% (see Figure 2.15).

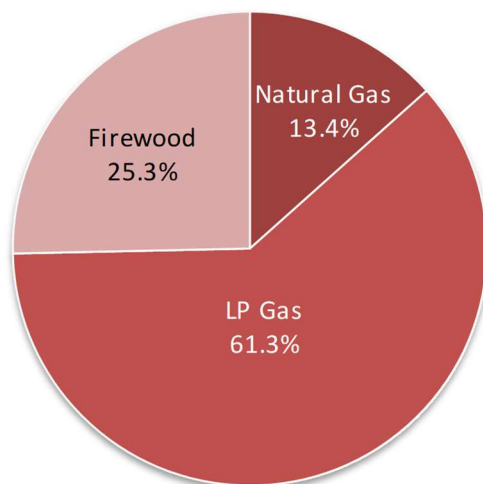
- By the end of 2016, the services sector’s fuels demand was of 272.0 MMCFDNGE, an increase by 1.6% regarding 2015; the share of NG was of 13.4% (see Figure 2.16).

**FIGURE 2. 15 HISTORICAL NATURAL GAS DEMAND IN THE SERVICES SECTOR**  
(MMCFD)



Source: SENER with information from IMP.

**FIGURE 2. 16 DOMESTIC FUELS DEMAND OF THE SERVICES SECTOR, 2016**  
(Percentage)



Source: SENER with information from IMP.

### 2.3 Regional Natural Gas Demand

To analyze the NG demand of the country, it is divided into five consumption regions: Northwest, Northeast, Central-Western, Central, and South-Southeast (see Figure 2.17).

- Except for the Central region, which decreased its demand in 3.7% regarding 2015, the remaining regions increase their demands.
- The region with the largest share in the total domestic natural gas demand was the Northeast, with a share of 32.8%; on the contrary, the Northwest region displayed the smallest demand with a 608.1 MMCFD volume, which represented an 8.0% share of the total domestic demand.

**FIGURE 2. 17 REGIONAL NATURAL GAS DEMAND, 2016**  
(MMCFD)



Source: SENER with information from IMP.

## 2.4 Natural Gas Remaining Reserves

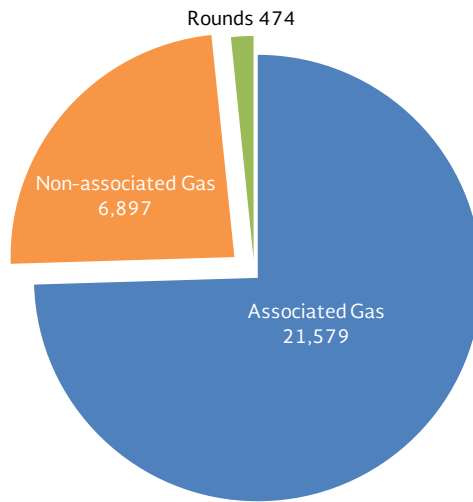
In the last decade, the NG remaining reserves in Mexico have decreased 53.5% due to the volatility of the crude's price, in addition to the variations in the exchange and interest rates which pressured downward the Pemex production.

- To January 1st, 2017, the total remaining gas reserves reached a volume of 28,950 MMCFD, 11.10% less regarding the previous year (see Figure 2.18).
- From the total reserves estimated to January 1st, 2017, 74% includes black-oil fields, volatile oil, and free associated wet gas; 24% include non-associated wet gas yields, dry gas, and condensate; and 2% includes gas reserves comprised in Round 1 which are not yet classified by type of gas.





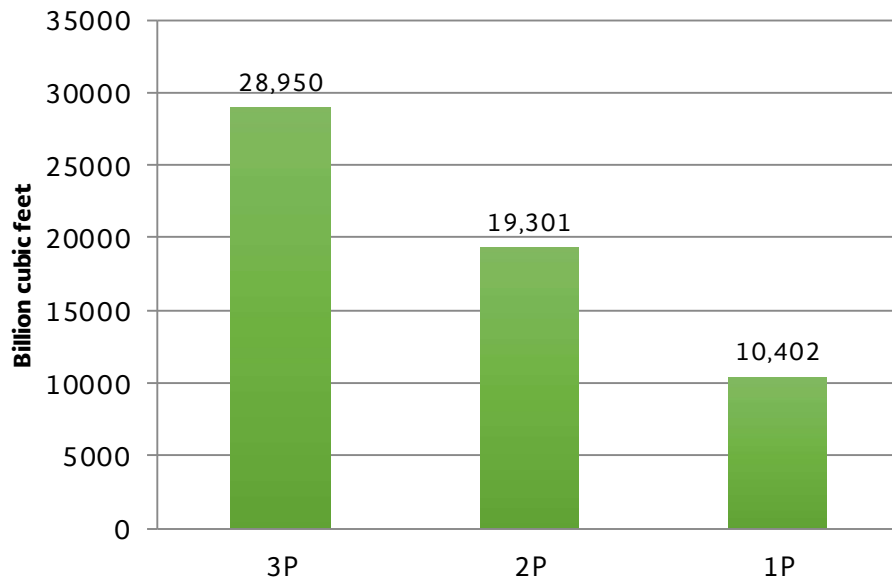
**FIGURE 2. 18 REMAINING NATURAL GAS RESERVES TO JANUARY 1<sup>ST</sup>, 2017**  
(BCF)



Source: SENER with information from CNH.

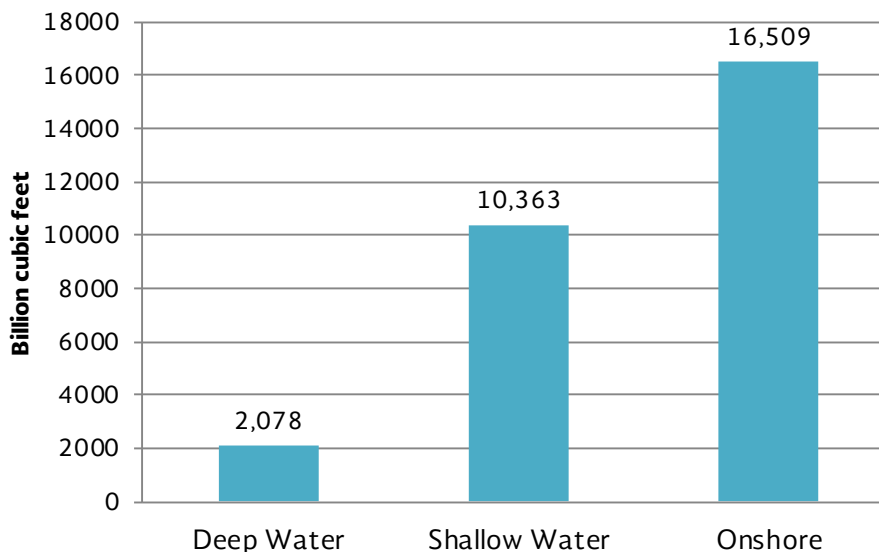
- To January 1st, 2017, proved reserves reached 10,402 MMCFD; probable reserves, 8,898.8 MMCFD; and possible reserves, 9,649.4 MMCFD (see Figure 2.19).

**FIGURE 2. 19 TOTAL REMAINING NATURAL GAS RESERVES BY CATEGORY, TO JANUARY 1<sup>ST</sup>, 2017**



Source: SENER with information from CNH.

- To January 1st, 2017, 57% of the remaining natural gas reserves were located in onshore regions, 35.79T in shallow water regions, and 7.17% in deep water regions (see Figure 2.20).

FIGURE 2. 20 NATURAL GAS REMAINING RESERVES BY REGION, TO JANUARY 1<sup>ST</sup>, 2017

Source: SENER with information from CNH.

## 2.5 Natural Gas Production

The tendering practices for the allocation of the Hydrocarbons Exploration and Extraction Agreements, named Rounds Mexico, will increase the NG production in the medium and long terms and will accelerate the hydrocarbons reserves restitution rate of the country.

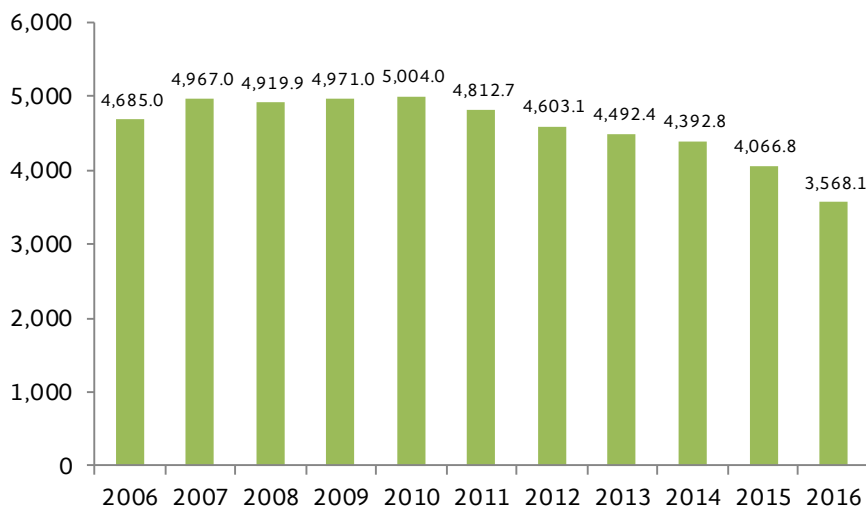
After the Reform, it will be possible to accede to non-conventional or frontier oil fields and thus minimize risks to guarantee better returns on investment for the country.<sup>36</sup>

- In 2016, the production of dry natural gas was of 3,568.1 MMCFD, 12.2% less regarding 2015 (see Figure 2.21).
- Regarding the production of natural gas direct from fields, it is classified in associated and non-associated. By the end of 2016, associated gas averaged 4,545.5 MMCFD, 5.8% less regarding the previous year due mainly to a smaller production in the Assets of the Southwest and South Marine regions. The volume of non-associated gas was of 1,266.0 MMCFD, 19.6% less than what was recorded in 2015.

<sup>36</sup> Fourth Government Report 2015-2016, p. 550.

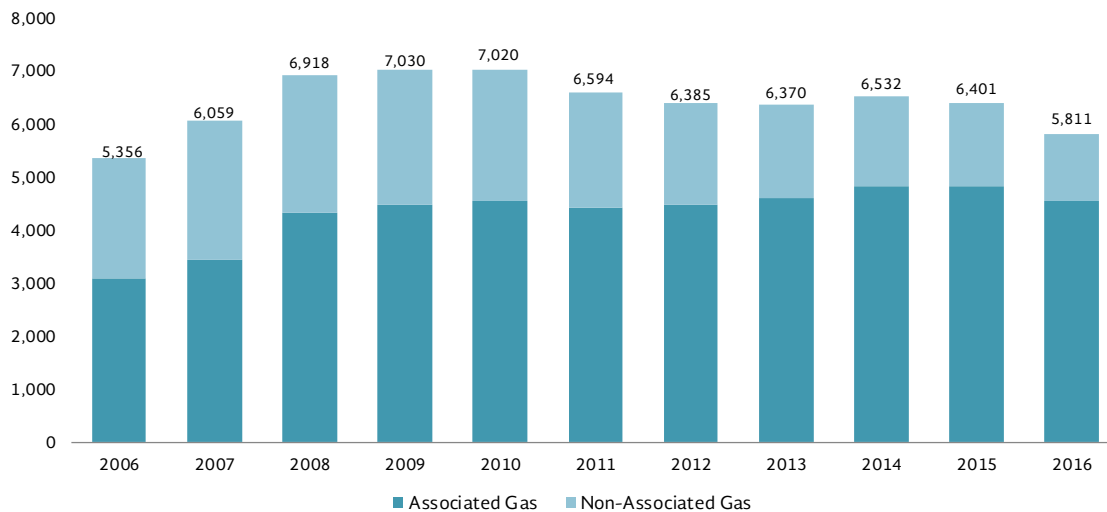


**FIGURE 2. 21 DRY NATURAL GAS PRODUCTION**  
(MMCFD)



Source: SENER with information from IMP.

**FIGURE 2. 22 HISTORICAL NATURAL GAS PRODUCTION BY TYPE**  
(MMCFD)

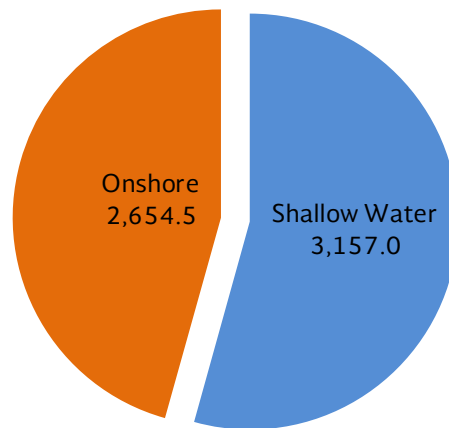


Includes nitrogen.

Source: SENER with information from CNH.

- 54.3% of the gas production in 2016 came from shallow-water basins, and 45.6% from offshore basins (see Figure 2.22).

**FIGURE 2. 23 NATURAL GAS PRODUCTION BY REGION, 2016**  
(MMCFD)



Source: SENER with information from CNH.

## 2.6 Natural Gas Foreign Trade

- Pemex Logistics, the electricity sector, and private companies carry out NG imports. Pemex imported 60.9% from the total volume, 20% more than the previous year; the electricity sector imported 32.3%, a decrease of 20% regarding 2015; and finally, private parties imported 6.8% of the total.
- By the end of 2016, an import volume of 4,168.1 MMCFD was recorded, which represented an increase by 17.5% regarding the previous year.
- From the total imported volume, 87.2% (3,791 MMCFD) came into the country by entry pipelines. Liquefied natural gas imports had a 12% share, reaching a volume of 527 MMCFD, a reduction of 27% regarding the previous year (see Figure 2.24).

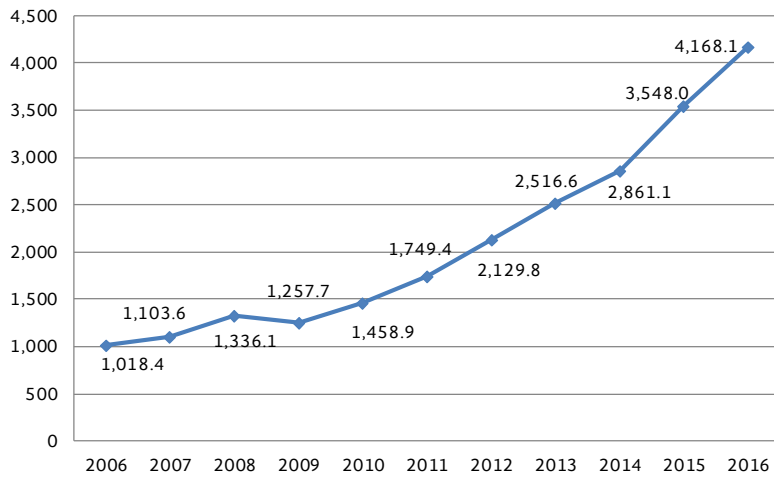


**FIGURE 2. 24 NATURAL GAS IMPORT AND EXPORT POINTS IN MEXICO, 2016**



Source: SENER with information from IMP.

**FIGURE 2. 25 HISTORICAL NATURAL GAS IMPORT (MMCFD)**



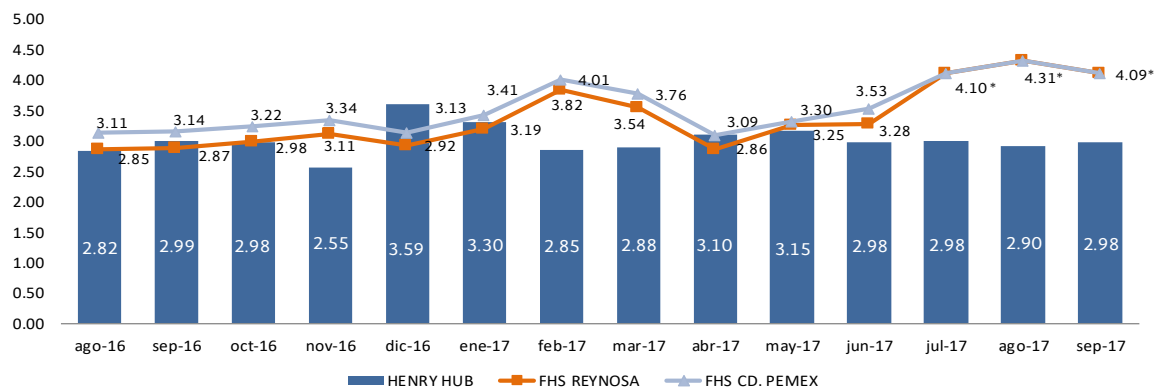
Source: SENER with information from IMP.

## 2.7 Natural Gas Prices

Since June 17, 2017, the CRE suspended the issuing of the FHS prices for natural gas and determined that the price which the EPE Pemex will carry out the natural-gas FHS will be determined by market conditions<sup>37</sup>; after that, the CRE determined the convenience of elaborating and publishing a national reference index of wholesale natural-gas prices (IPGN, for its Spanish acronym), which reflects the prices of the transactions freely executed by the market traders.

The IPGN will be published in pesos per Gigajoule (MXN/GJ) and in dollars per million British thermal units (USD/MBTU) to make it comparable with reference prices and the indexes of international prices<sup>38</sup>. On August 17, 2017 the CRE approved the methodology to estimate each month the National Reference Index of Wholesale Natural Gas Prices (IPGN), and which will be constructed with the average price of the transactions in the Mexican market<sup>39</sup>.

**FIGURE 2. 26 REFERENCE PRICES FOR NATURAL GAS IN MEXICO.**  
(USD/MMBTU)



\* Since July 2017, the CRE reports every month the IPGN, derived from the elimination of the natural gas maximum FHS price. SENER with data from CRE.

## 2.8 Natural Gas Infrastructure

After the implementation of the Natural Gas Supply Comprehensive Strategy issued on August 2013, the supply of natural gas will be guaranteed through the expansion of the transportation network by pipeline.

### Advances in the Natural Gas Infrastructure

- From December 1st, 2012 to August 2017, 3,392 kilometers have been added to the national pipelines network, an increase by 21% regarding November 2012; and fourteen new pipelines have been concluded.
- From June 7, 2016 to June 6, 2017, it was concluded the pipelines Los Ramones Phase II South. CENAGAS led the project which consisted in the construction of a NG transportation system

<sup>37</sup> Agreement No. A/026/2017 of the CRE which invalidates the methodology to determine the maximum natural gas prices subjected to FHS.

<sup>38</sup> Considering the Twentieth of the Agreement No. A/034/2014 whereby the CRE publishes the INPNG.

<sup>39</sup> <https://www.gob.mx/cre/documentos/indice-de-referencia-nacional-de-precios-de-gas-natural-al-mayoreo-ipgn?idiom=es>



running from Villa Hidalgo, San Luis Potosí to Apaseo el Alto, Guanajuato, with a length of 291 kilometers, a maximum capacity of 1,430 MMCFD, and an investment for 945 million dollars.

- Between July 2016 and March 2017, two new entry pipelines were concluded: the Waha-Presidio and Waha-San Elizario.
- On July 2016, the CFE put out to tender a contract for natural gas transportation by pipeline: South of Texas-Tuxpan (marine). This project will expand by 742 km the pipelines network and will require an investment estimated in 2,111 million dollars.
- Currently, there are 9 projects in construction: 1) El Encino-Topolobampo, 5) El Encino-La Laguna; 7) Nueva Era; 8) Tuxpan-Tula; 9) La Laguna-Aguascalientes; 10) Tula-Villa de Reyes; 11) Villa de Reyes-Aguascalientes-Guadalajara; 12) Samalayuca-Sasabe; 13) Matamoros-Tuxpan (marine), which entail an investment of 6,706 million dollars and an increase of 4,129 km to the network.
- By the end of 2016, the CRE had 57 valid permits for natural-gas open access transportation by pipeline, from which 34 are in operation, and 23 in construction; these permits represent a total length of 18,994.4 km (Table 2.1).

TABLE 2. 1 OPEN-ACCESS TRANSPORTATION PERMITS OF NATURAL GAS, 2016

	Permittee	Startup	Length (km)	Average Volume MMCFD	Investment (million dollars)	Status
1	Kinder Morgan Gas Natural de México, S. de R. L. de C. V.	20/03/2003	138.6	532,287.0	45.0	Operating
2	Gasoductos de Chihuahua, S. de R. L. de C. V.	20/12/1997	37.9	280.8	18.2	Operating
3	Igasamex San José Iturbide, S. de R. L. de C. V.	18/03/1998	5.0	2.1	0.4	Operating
4	Energía Mayakan, S. de R. L. de C. V.	30/09/1999	786.9	53,489.9	276.9	Operating
5	Tejas Gas de Toluca, S. de R. L. de C. V.	28/02/2003	175.3	46.6	31.0	Operating
6	Finsa Energéticos, S. de R. L. de C. V.	26/06/1998	7.9	1,592,269.2	0.3	Operating
7	Gasoductos del Bajío, S. de R. L. de C. V.	03/04/2001	204.2	47,477.1	56.5	Operating
8	Transportadora de Gas Natural de Baja California, S. de R. L. de C. V.	15/06/2000	48.0	97.0	28.4	Operating
9	Gasoducto Rosarito, S. de R. L. de C. V.	01/09/2002	302.4	275.4	124.4	Operating
10	Gasoducto de Aguaprieta, S. de R. L. de C. V.	12/12/2002	12.5	105.0	6.6	Operating
11	Gasoductos de Tamaulipas, S. de R. L. de C. V.	12/11/2003	114.2	1,330.6	238.7	Operating
12	Gasoducto del Río, S. A. de C. V.	01/08/2003	57.9	170,161.6	39.3	Operating
13	Conceptos Energéticos Mexicanos S. de R. L. de C. V.	18/12/2003	1.6	0.6	0.8	Operating
14	Transportadora de Gas Natural de la Huasteca, S. de R. L. de C. V.	01/12/2014	356.3	392,444.7	225.7	Operating
15	Tarahumara Pipeline, S. de R. L. de C. V.	30/07/2013	383.9	64,758.3	368.8	Operating
16	Energía Occidente de México, S. de R. L. de C. V.	15/06/2011	310.5	392,444.7	486.4	Operating
17	Gasoducto de Morelos, S. A. P. I. de C. V.	15/04/2016	172.2	24,331.8	238.0	Operating
18	Gasoductos del Northeast, S. de R. L. De C. V.	01/12/2014	116.4	1,789.9	486.8	Operating
19	Gasoducto de Aguaprieta, S. de R. L. de C. V.	24/12/2014	864.3	81.8	1,046.0	Operating
20	Gas Natural del Northwest, S.A. de C.V.	29/08/2014	174.9	12.6	60.0	Operating
21	TAG Pipelines Norte, S. de R. L. de C. V.	01/06/2016	451.6	619,036.9	1,287.0	Operating
22	Infraestructura Energética Monarca, S. de R.L. de C.V. (antes Transportadora de Gas Natural del Northwest)	19/07/2017	950.6	-	1,027.5	In construction
23	TAG Pipelines Sur, S. de R.L. de C.V.	01/06/2016	291.5	617,465.5	896.7	Operating
24	Arguelles Pipeline, S. de R. L. de C. V.	19/10/2015	2.9	110.7	10.0	Operating
25	ATCO Pipelines, S. A. de C. V.	Not operating	14.8	-	43.1	In construction

\*Continues in the next page.

Source: CRE





	Permittee	Startup	Length (km)	Average Volume MMCFD	Investment million dollars)	Status
26	Gas Natural del Northwest, S.A. de C.V.	Not operating	5.1	-	1.7	In construction
27	Gasoducto de Aguaprieta, S. de R. L. de C. V.	Not operating	221.2	-	373.6	In construction
28	Gasoducto de Aguaprieta, S. de R. L. de C. V.	31/03/2017	28.5	27.2	157.7	Operating
29	Compañía de Gas Natural Santa Rosa, S. de R. L. de C. V.	18/02/2016	10.2	1.0	0.8	Operating
30	Transportadora de Gas de Trancoso, S. A. de C. V.	Not operating	2.8	-	0.6	In construction
31	Fermaca Pipeline El Encino, S. de R. L. de C. V.,	Not operating	465.1	-	819.2	In construction
32	Gas Natural del Northwest, S. A. de C. V.	Not operating	1.9	-	0.9	In construction
33	Central Logístico Jalisco, S.A. de C.V.	Not operating	3.3	-	0.5	In construction
34	Midstream de México S. de R.L. de C.V.	Not operating	275.6	-	515.0	In construction
35	Energía Infra, S. A. P. I. de C. V.	30/06/2016	1.9	-	2.3	Operating
36	Gas Natural Río Blanco, S. de R. L.	Not operating	6.2	-	0.9	In construction
37	Gas Natural del Northwest, S. A. de C. V.	01/09/2016	9.9	29.4	11.9	Operating
38	Merigas Sur, S. de R.L. de C.V.	Not operating	0.2	-	0.3	In construction
39	Consumidora Industrial de Hidalgo, S. de R.L. de C.V.	Not operating	4.8	-	1.1	In construction
40	Industrias Derivadas del Ethylene S. R. L. de C. V.	Not operating	0.1	-	0.4	In construction
41	Gas Natural del Northwest, S. A. de C. V.	21/10/2016	0.7	0.2	0.6	Operating
42	Siderúrgica de Linares, S. A. de C. V.	Not operating	3.6	-	2.3	In construction
43	Transportadora de Gas Natural de la Huasteca, S. de R. L. de C. V.	Not operating	287.8	-	585.5	In construction
44	Transportadora de Gas Natural de la Huasteca, S. de R. L. de C. V.	Not operating	408.5	-	596.5	In construction
45	GN del Valle, S. R. L. de C. V.	Not operating	5.2	-	1.0	In construction
46	Gas Natural del Northwest, S. A. de C. V.	Not operating	43.7	-	11.1	In construction
47	Gas Natural del Northwest, S.A. de C.V.	Not operating	15.4	-	11.1	In construction
48	Gas Natural del Northwest, S.A. de C.V.	Not operating	23.4	-	24.0	In construction
49	Gas Natural del Northwest, S.A. de C.V.	Not operating	48.4	-	2.1	In construction
50	Central Nacional de Control de Gas Natural	18/03/1999	8,704.0	141,926.1	436.5	Operating
51	Central Nacional de Control de Gas Natural	02/06/1999	339.0	2,101.3	22.1	Operating
52	Pemex Logística	01/01/2016	701.5	NP	285.9	Operating
53	Pemex Logística	01/01/2016	19.0	NP	2.6	Operating
54	Pemex Logística	01/01/2016	29.3	NP	3.7	Operating
55	Pemex Logística	04/08/2016	523.4	NP		Operating
56	Fermaca Pipeline de Occidente, S. de R. L. de C. V.	Not operating	378.7	-	1,000.0	In construction
57	Fermaca Pipeline La Laguna, S. de R. L. de C. V.	Not operating	443.8	-	555.0	In construction
	<b>Domestic Total</b>		<b>18,994.4</b>	<b>4,654,384.9</b>	<b>12,469.2</b>	

NP= Not presented.

Source: CRE

- Regarding the natural-gas distribution permits, by the end of 2016 the CRE accounted 23 permits with a cumulative length of 67,918 km and a coverage of 3.3 million users distributed throughout the country (Table 2.2).

**TABLE 2. 2. DATA AND QUINQUENNIAL COMMITMENTS OF THE DISTRIBUTION PERMITTEES BY THE END OF 2016**

NG Distribution Permits by Region	Location	Length (km)	Average Volume per Day (MMCFD)	By the end of its 5-year period			By the end of 2016			
				NG Average Volume per Day (Gcal)	Users Coverage	Investment (thousand dollars)1/	Users Coverage	Volume of NG conducted (GCal)	Length of cumulative network (km)	
<b>Domestic Total</b>		<b>67,918</b>	<b>1,170</b>	<b>338,008</b>	<b>3,386,821</b>	<b>773,913</b>	<b>2,642,092</b>	<b>116,589,080</b>	<b>54,618</b>	
<b>Total Northeast Region</b>		<b>35,012</b>	<b>495</b>	<b>175,223</b>	<b>1,543,373</b>	<b>160,136</b>	<b>1,532,289</b>	<b>48,187,177</b>	<b>34,250</b>	
1	Compañía Nacional de Gas Q4/	Piedras Negras	723	10	2,493	12,719	-	12,442	1,178,481	736
2	Ecogas México (antes DGN de	Chihuahua	2,354	31	7,636	72,619	36,874	72,544	3,787,408	2,153
3	Gas Natural México (Saltillo) Q4/	Saltillo-Ramos Arispe-Arteaga	2,644	27	6,497	101,397	-	96,527	2,785,568	2,827
4	Compañía Mexicana de Gas Q4/	Monterrey	3,797	66	15,738	170,862	13,730	136,711	5,156,070	3,036
5	Gas Natural México (Nuevo Laredo) Q4/	Nuevo Laredo, Tamaulipas	1,153	4	884	34,155	6,489	34,011	314,310	1,220
6	Gas Natural de Juárez Q4/	Ciudad Juarez	5,166	6	1,553	269,336	43,706	248,865	2,594,110	4,788
7	Tractebel GNP Q4/	Río Pánuco	877	35	64,606	46,564	-	41,843	3,787,443	830
8	Tamauligas Q4/	Norte de Tamaulipas	1,049	11	2,619	24,114	3,956	20,439	1,028,541	1,015
9	Gas Natural México (Monterrey) Q4/	Monterrey	15,874	255	60,967	770,252	20,099	838,082	23,788,392	16,598
10	Ecogas México (antes DGN La Laguna-El	Torreón-Gomez Palacio-Ciudad Lerdo-Durando	1,074	11	2,771	31,293	16,125	30,820	1,093,046	1,020
11	Gas Natural del Northwest (Río Pánuco)	Río Pánuco	302	39	9,457	10,062	19,157	5	2,673,807	26
<b>Total Central Region</b>		<b>21,897</b>	<b>445</b>	<b>106,451</b>	<b>1,422,865</b>	<b>418,663</b>	<b>808,532</b>	<b>45,952,652</b>	<b>11,500</b>	
12	Gas Natural México (Toluca) Q4/	Toluca	1,098	41	9,933	47,461	10,703	38,490	3,685,740	977
13	Comercializadora Metrogas Q4/	Ciudad de México	7,475	112	26,862	730,197	255,150	484,376	6,202,230	4,240
14	Consorcio Mexi-Gas Q4/	Valle Cuautitlán-Texcoco-Hidalgo	6,967	143	34,296	350,628	-	191,216	13,661,813	4,230
15	Gas Natural del Northwest (Valle Cuautitlán-)	Valle Cuautitlán-Texcoco-Hidalgo	472	4	846	17,294	47,625	4,507	13,855,074	291
16	Natgasmex Q4/	Puebla-Tlaxcala	2,011	56	13,425	114,633	-	89,878	5,841,398	1,662
17	Gas Natural del Northwest (Veracruz) C	Veracruz	3,654	29	6,864	135,846	76,059	34	2,217,179	80
18	Gas Natural del Northwest (Morelos) Q	Morelos	221	59	14,224	26,806	29,126	31	489,217	19
<b>Total Central - Western Region</b>		<b>9,207</b>	<b>203</b>	<b>49,745</b>	<b>381,387</b>	<b>127,298</b>	<b>272,105</b>	<b>19,665,093</b>	<b>7,757</b>	
19	Tractebel Digaqro Q3/	Querétaro	1,766	60	15,047	73,119	81,381	68,731	6,325,705	1,602
20	Gas Natural México (Bajío) Q4/	la Bajío Norte, Silao-León-Irapu	6,065	90	21,457	253,877	17,354	172,415	7,364,582	4,410
21	Tractebel DGJ Q3/	Guadalajara	1,376	53	13,241	54,391	28,563	30,959	5,974,806	1,744
<b>Total Northwest Region</b>		<b>1,801</b>	<b>27</b>	<b>6,589</b>	<b>39,196</b>	<b>67,816</b>	<b>29,166</b>	<b>2,784,159</b>	<b>1,112</b>	
22	Ecogas México (antes DGN de Mexicali)	Mexicali	622	19	4,777	14,288	21,544	15,975	2,438,738	556
23	Gas Natural del Northwest (Sonora) Q3.	Hermosillo	1,179	8	1,813	24,908	46,271	13,191	345,421	556

1/ Currency exchange to June 2017.

Q1/ Companies in their first five-year period.

Q2/ Companies in their second five-year period.

Q3 / Companies in their third five-year period.

Q4 / Companies in their fourth five-year period.

Source: CRE

In addition to the pipelines network, the current infrastructure of natural gas comprises 9 natural gas processing complexes operated by PEMEX Industrial Transformation; likewise, it includes 3 liquefied natural gas regasification terminals with a regasification capacity of up to 2,900 MMCFD, and which also work as storage terminals with a capacity of 920,000 m<sup>3</sup> and 22 compression units located each 60 or 80 km throughout the pipeline and whose aim is to recompress the gas to maintain its specified pressure and flow.



## CHAPTER THREE. NATURAL GAS PROSPECTIVE MARKET

This section presents the Natural-Gas Market outlook, with a 15-year planning horizon. To define the NG-production platform it presents, Pemex work jointly with the CRE and the General Directorate of Hydrocarbons Exploration and Extraction of the Secretariat of Energy.

It considers two production scenarios: maximum and minimum, which were defined based on the extraction profiles of Pemex and on the prospective profiles of the blocks allocated in the Bidding Rounds suggested by the CNH.

The extraction component includes production fields discovered, so there is certainty about the existence of the resources in the subsoil even if there is no certainty about the amount of the existing resources.

The classification of the extraction fields is as follows:

Fields allocated to **PEMEX**

Allocation of fields in production

Allocation of fields in production with plans of contracts migration

Allocation of Safekeeping Areas (AR Allocations)

Allocation of exploration areas in which hydrocarbons reserves have been discovered (AE Allocations)

Fields of the **State**

Extraction fields tendered

Extraction field to be tendered

On the other hand, the extraction component has information about exploratory opportunities which could be discovered and developed and are associated to a risk level and an uncertainty level.

To estimate the production scenarios, it was determined which exploratory opportunities have high probabilities of being successfully developed within the next 15 years, under the legal framework that governs the Mexican energy sector and the scheme of blocks allocations and assignments through Bidding Rounds (blocks of gas and oil for offshore areas, shallow-marine areas, and deep-marine areas). It considers the results of the biddings 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3 as blocks already allocated.

The universe of opportunities is distributed into three sections: the ones assigned by Pemex in Round Zero; the ones considered in the Quinquennial Plan to be put out to tender during the period 2015-2019; and the ones which have not been assigned to Pemex and are not included in the Quinquennial Plan but which can be put out to tender in subsequent periods.

Once it has been defined which opportunities will be active in each scenario, a type profile of production and investment in capital is applied for each type of field (offshore, shallow water, and deep water).

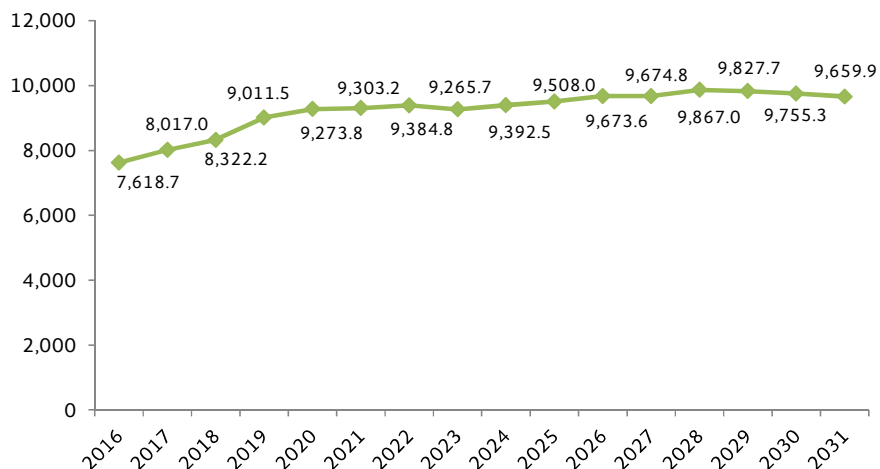
To elaborate the domestic natural gas demand 2017-2031, the Mexican Petroleum Institute (IMP, for its Spanish acronym) is in charge of making the projections of the fuels demand based on macroeconomic

variables, such as the domestic and industrial GDP, reference price, trending demands, as well as the development of new infrastructure of pipelines in the country, among other.

### 3.1 Natural Gas Domestic Demand

By 2031, the natural gas demand is estimated to increase by 26.8% regarding 2016, reaching a volume of 9,656.9 MMCFD. This increase is related to the expansion of the NG infrastructure and to the startup of several combined-cycle plants (which produce from 50 MW, as the extensions of the IEP stations Saltillo and Valle Hermoso, to 1,113 MW, as Tamazunchale III) that, given their plant factors will demand a considerable amount of this fuel, and to the Cogeneration projects of Pemex (Cadereyta, Madero, Minatitlan, Morelos, and Salina Cruz) which will have an average installed capacity of 411 MW, and an average natural gas consumption related to electricity generation of 27 MMCFD each of them.

**FIGURE 3. 1 DOMESTIC NATURAL GAS DEMAND, 2016-2031**  
(MMCFD)



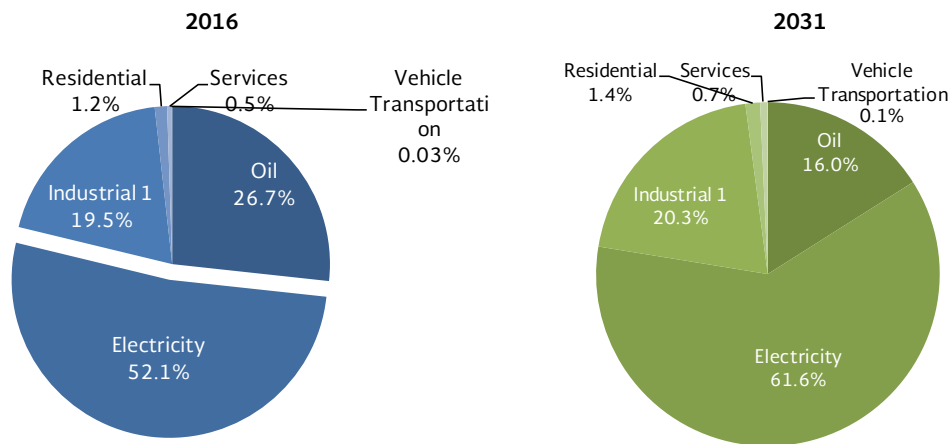
Source: SENER based on information from IMP.



### 3.2 Sectorial Natural Gas Demand

In 2031, the demand will increase in most sectors, except for the oil sector, where it will decrease 24% regarding 2016. By 2031, the electricity sector will consume 61.6%, a volume of 5,947.2 MMCFD becoming the largest natural gas consumer; the industrial sector is second with a 20.3% share; the oil sector with 16.0%; residential and services with 1.4% and 0.7%, respectively; and finally, the motor-carrier sector with 0.1% (see Figure 3.2).

FIGURE 3. 2 NG DEMAND BY SECTOR, 2016-2031.  
(MMCFD)

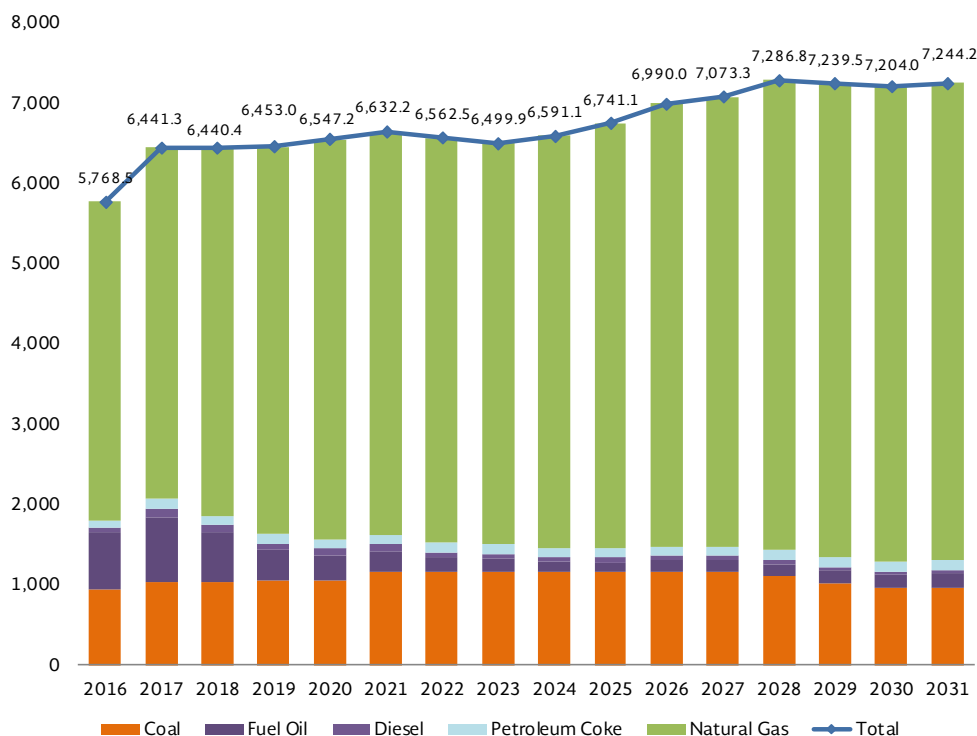


Note1: The industrial sector includes the Project Ethylene XXI.  
Source: SENER with information from IMP,

### Electricity Sector

In 2031, the electricity sector will have a fossil fuels demand of 7,244.2 MMCFDNGE, an increase by 25.6% regarding 2016, while fuel oil and diesel will decrease their demand 74.9% and 36.8%, respectively, while the utilization of natural gas, petroleum coke, and coal will increase by 50.0%, 32.1%, and 2.3%, respectively (see Figure 3.3).

**FIGURE 3. 3 FUELS DEMAND IN THE ELECTRICITY SECTOR, 2016-2031**  
(MMCFDNGE)



Source: SENER with information from IMP.

Natural gas will have a share of 82% in the total fuels consumption, and its demand will increase from 3,965.7 MMCFD in 2016 to 5,947.2 MMCFD in 2031, as a result of the implementation of the natural gas market in our country, the development of its infrastructure, and the CFE's strategy of replacing high-cost and pollutant fuels for more efficient and sustainable ones such as natural gas; this strategy is part of the clean energy targets established by the Energy Transition Law published on December 2015 with the purpose of regulating the sustainable utilization of energy and the obligations in matters of Clean Energies and reduction of pollutant emissions of the Electric Industry.

Between 2014 and 2016, the CFE upgraded seven thermal-electric plants to dual combustion so these can use not only fuel oil, but also natural gas to generate electricity, whose price and emissions are lower and help to expand the plants' lifespan<sup>40</sup>.

### Industrial Sector

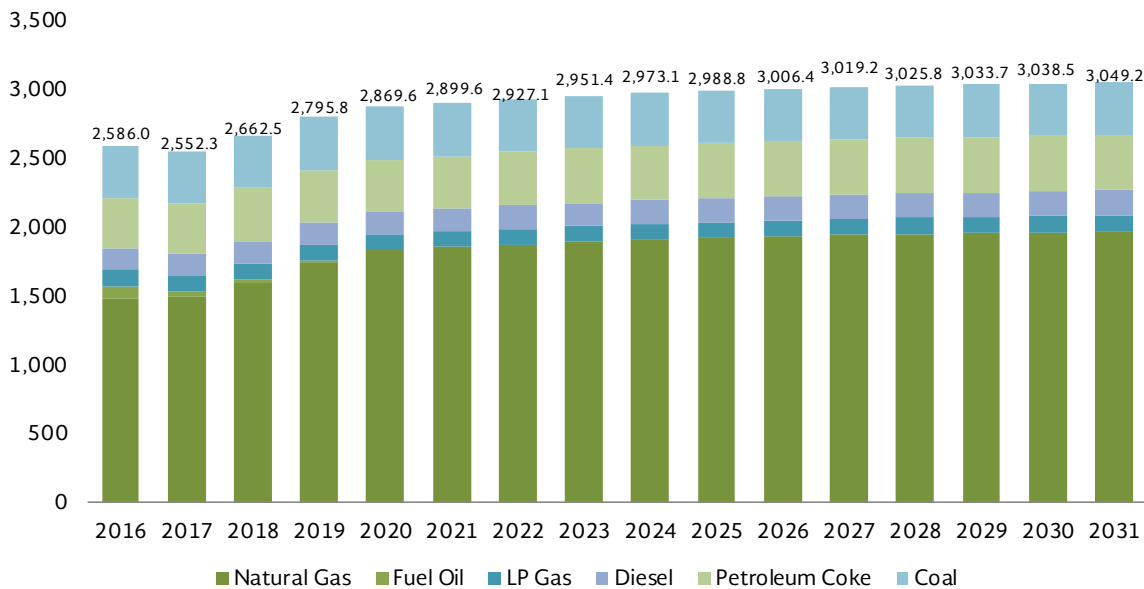
By 2031, it is expected this sector's fossil fuels demand will reach a volume of 3,049.2 MMCFDNGE, a reduction of 3.3% regarding 2016. Fuel oil and LP gas will be the fuels which will decrease their demand in 100% and 2.1%, respectively. On the contrary, its natural gas demand will increase by 32.3%, seconded by diesel with 19.9%, petroleum coke with 10.2%, and finally, coal with 0.9%.

The natural gas demand will raise from 1,484.1 MMCFD to 1,964.1 MMCFD in 2031, which represent 64.4% of the total fossil fuels demand in this sector (see Figure 3.4).

<sup>40</sup> Annual Report CFE 2016, p. 33.



**FIGURE 3. 4 FOSSIL FUELS DEMAND IN THE INDUSTRIAL SECTOR, 2016-2031**  
(MMCFDNGE)



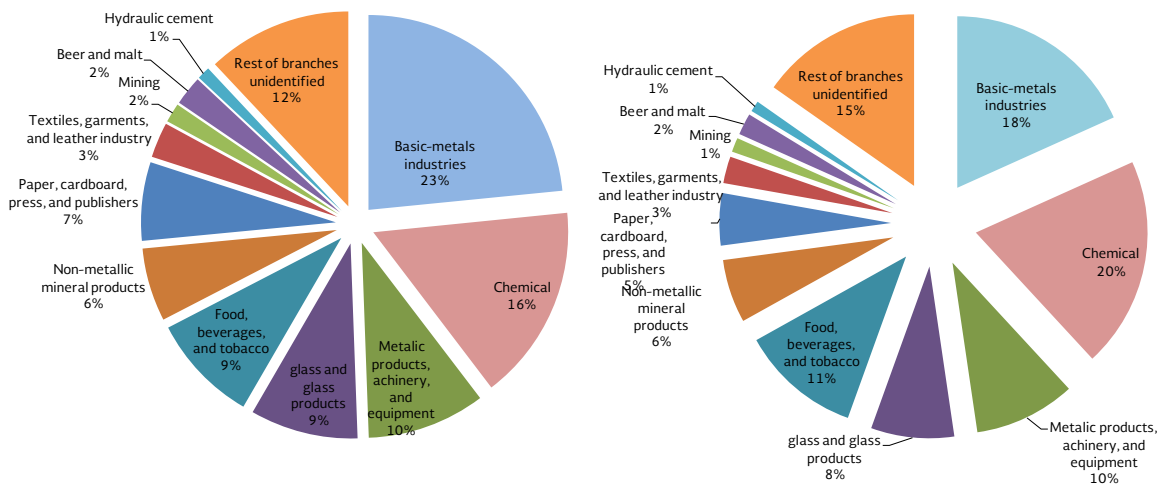
Source: SENER with information from IMP.

In 2031, is estimated the chemical industry will be the largest natural-gas consumer with a 19.9% share, 390.1 MMCFD; on the contrary, the hydraulic-cement industry will consume only 20.3 MMCFD, a share of 1.0% (see Figure 3.5).

It is worth mentioning the new development of the chemical industry in Topolobampo (Sinaloa) comprises an ammonia plant which will use gas as its input and fuel. It is estimated this plant will have a daily consumption of 110 MMCFD<sup>41</sup>.

<sup>41</sup> General Coordination of Strategic Projects. Government of Sinaloa.

**FIGURE 3. 5 INDUSTRIAL NATURAL GAS DEMAND BY GROUP OF BRANCHES, 2016-2031**  
(Percentage)



Source: SENER with information from IMP.

The industrial sector’s demand takes into account a trending demand (economic growth and fuels prices) and a non-trending demand (new projects which use natural gas, new transportation infrastructure, and the consumption of compressed natural gas). The trending demand will reach a volume of 1,667.6 MMCFD in 2031, which is an increase of 11.4% regarding 2017; on the other hand, the non-trending demand will raise from 0.0 MMCFD in 2017 to 296.6 MMCFD in 2031 (see Table 3.1).

**TABLE 3. 1. INDUSTRIAL DEMAND OF NATURAL GAS BY PROJECTION COMPONENT, 2017-2031.**  
(MMCFD)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
<b>Total</b>	1,429.8	1,496.8	1,667.1	1,961.8	2,109.1	2,132.9	2,156.1	2,176.2	2,195.7	2,209.7	2,223.0	2,235.4	2,243.9	2,249.6	2,254.1	2,260.6
<b>Trend Demand</b>	1,381.6	1,496.8	1,518.9	1,536.3	1,556.1	1,573.4	1,590.2	1,604.8	1,618.9	1,629.1	1,638.9	1,648.1	1,654.5	1,658.9	1,662.5	1,667.6
<b>Non-Trend Demand</b>	48.2	0.0	74.1	212.7	276.5	279.8	282.9	285.7	288.4	290.3	292.1	293.7	294.7	295.4	295.8	296.5
Industrial Projects	21.4		45.9	151.7	209.6	211.6	213.5	215.1	216.8	217.7	218.5	219.2	219.5	219.4	219.2	219.2
Compressed Natural Gas	4.4			4.7	9.4	9.5	9.6	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.6	9.6
Distribution Development	22.3		28.2	56.3	57.5	58.7	59.9	60.9	61.9	62.9	63.8	64.7	65.5	66.3	67.0	67.8

Source: SENER with information from IMP.

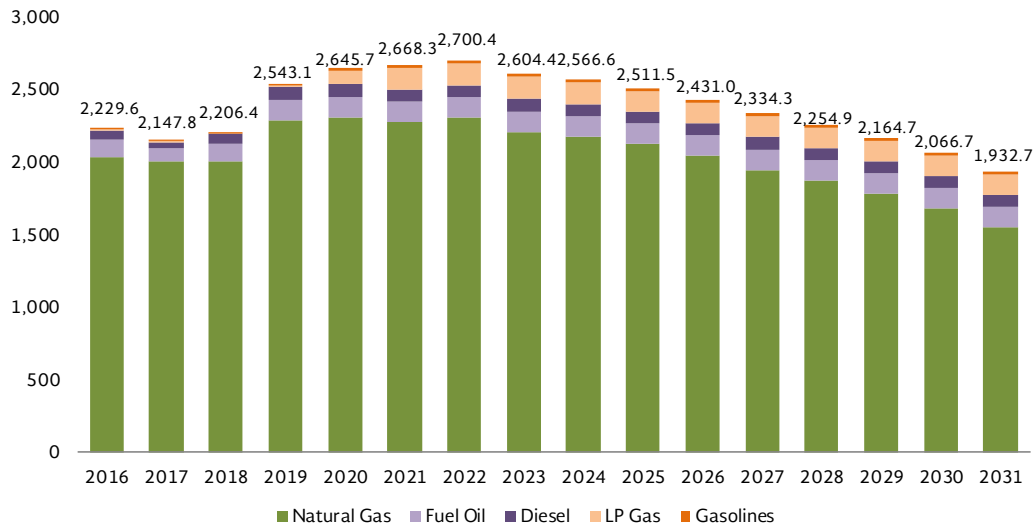
## Oil Sector

In 2031, the oil sector’s fuels demand will reach a volume of 1,932.7 MMCFDNGE, a decrease of 31.0% regarding 2016. Natural gas will remain as this sector’s most consumed fuel with a share of 80.0%; however, it will display a decrease of 24%, going from 2,034.8 MMCFD to 1,546.7 MMCFD in 2031 (see Figure 3.6). The contribution of LP gas is estimated in 7.3%, fuel oil in 7.2%, diesel in 4.4%, and gasoline in 1.0% (see Figure 3.6).





**FIGURE 3. 6 FUELS DOMESTIC DEMAND IN THE OIL SECTOR, 2016-2031.**  
(MMCFDNGE)



Source: SENER with information from IMP.

### Residential Sector

The residential sector’s fuels demand in 2031 is estimated to decrease 7.2% regarding 2016, going from 1,164.3 MMCFDNGE TO 1,080.3 MMCFDNGE in 2031. This decrease is related to the penetration of solar water heaters, the improvement on the thermal efficiency of conventional heating systems, and it is estimated a trend towards a more rational use of water and the replacement of cooking stoves with electricity.

LP gas will remain as the most utilized fuel in this sector with a 54.5% share, seconded by firewood with a contribution of 33.2%, and finally, natural gas with 12.3%. The natural gas demand will increase 40.0%, going from 94.8 MMCFD in 2016 to 132.8 MMCFD IN 2031, which results from replacing LP gas and firewood with natural gas (see Table 3.2).

**TABLE 3. 2. FUELS CONSUMPTION IN THE RESIDENTIAL SECTOR, 2016-2031.**  
(MMCFDNGE)

Year	Gas LP (MMCFDNGE)	Firewood (MMCFDNGE)	Natural Gas (MMCFD)	Total (MMCFDNGE)
2016	632.6	436.9	94.8	1,164.3
2017	611.6	438.1	96.6	1,146.2
2018	599.3	431.0	100.6	1,131.0
2019	593.8	425.7	104.8	1,124.3
2020	593.0	418.8	108.5	1,120.3
2021	592.8	414.5	111.9	1,119.2
2022	592.1	408.1	115.0	1,115.2
2023	591.1	402.9	117.7	1,111.6
2024	590.5	396.0	120.3	1,106.7
2025	589.9	391.7	122.6	1,104.3
2026	589.7	386.0	124.8	1,100.4
2027	589.6	380.7	126.8	1,097.0
2028	589.7	374.2	128.7	1,092.5
2029	589.9	370.4	130.4	1,090.7
2030	590.2	363.2	132.0	1,085.4
2031	589.2	358.3	132.8	1,080.3
<b>AAGR</b>	<b>-0.5</b>	<b>-1.3</b>	<b>2.3</b>	<b>-0.5</b>

Source: SENER with information from IMP.

## Services Sector

In 2031, the fuels demand in the services sector will reach a volume of 323.5 MMCFDNGE, a decrease of 3.3% regarding 2016. Just as in the residential sector, LP gas will be the most consumed fuel reaching a volume of 203.6 MMCFDNGE in 2031, an increase of 22.2% regarding 2016 and a share of 62.9% of the total fuels, seconded by natural gas with a share of 19.6% and an increase by 73.8%, and finally firewood, which will go from 69.9 MMCFD to 56.6 MMCFD, with a 17.5% share (see Table 3.3).

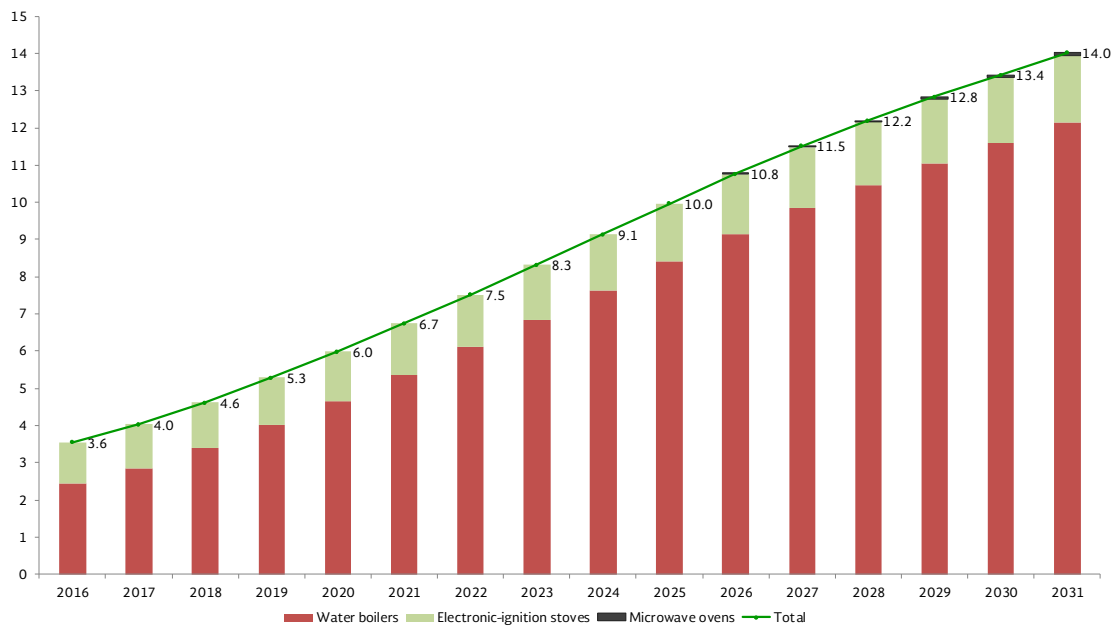
**TABLE 3. 3. FUELS CONSUMPTION IN THE SERVICES SECTOR, 2016-2031.**  
(MMCFDNGE)

Year	Gas LP (MMCFDNGE)	Firewood (MMCFDNGE)	Natural Gas (MMCFD)	Total (MMCFDNGE)
2016	166.7	69.9	36.4	273.0
2017	165.4	69.0	37.5	271.8
2018	164.9	68.1	38.8	271.8
2019	165.6	67.2	40.4	273.1
2020	166.9	66.1	41.9	274.9
2021	168.9	65.3	43.8	277.9
2022	171.3	64.5	45.6	281.3
2023	173.9	63.5	47.4	284.9
2024	176.8	62.5	49.3	288.6
2025	179.9	61.8	51.2	292.9
2026	183.3	60.9	53.2	297.4
2027	186.8	60.0	55.2	302.1
2028	190.6	59.1	57.2	306.9
2029	194.7	58.1	59.2	312.0
2030	199.0	57.4	61.2	317.6
2031	203.6	56.6	63.3	323.5
<b>AAGR</b>	<b>1.3</b>	<b>1.4</b>	<b>3.8</b>	<b>-0.2</b>

Source: SENER with information from IMP.

In 2031, the fuels demand in the services sector will reach a volume of 323.5 MMCFDNGE, a decrease of 3.3% regarding 2016. Just as in the residential sector, LP gas will be the most consumed fuel reaching a volume of 203.6 MMCFDNGE in 2031, an increase of 22.2% regarding 2016 and a share of 62.9% of the total fuels, seconded by natural gas with a share of 19.6% and an increase by 73.8%, and finally firewood, which will go from 69.9 MMCFD to 56.6 MMCFD, with a 17.5% share (see Table 3.3).

**FIGURE 3. 7. NATURAL GAS SAVING IN THE RESIDENTIAL AND SERVICES SECTORS, 2016-2031.**  
(MMCFD)



Source: SENER with information from IMP.

To estimate the natural-gas saving in the residential and services sectors two scenarios are elaborated, the first one considers there is no energy saving due to heaters' efficiency, electronic-ignition stoves, and microwave ovens, and for which is expected the natural-gas demand will reach a volume of 210.1 MMCFD in 2031. On the other hand, the natural-gas demand in the scenario with efficiency will reach a volume of 196.1 MMCFD for that same year. In this sense, it is expected that by the end of the period there will be a natural gas cumulative saving of 139.9 MMCFD (see Figure 3.8).



**FIGURE 3. 8. NATURAL GAS SAVING IN THE RESIDENTIAL AND SERVICES SECTORS, 2016-2031.**  
(MMCFD)



Source: SENER with information from IMP.

### Motor-Carrier Sector

It is estimated that by 2031 the motor-carrier sector’s demand will record a volume of 7,526.1 MMCFDNGE, an increase by 26.0% regarding 2016. Gasoline will remain as the main fuel used in this sector with a volume of 4,738.7 MMCFDNGE and a share of 63.0% of the total demand; followed by diesel with a share of 35.2%, and finally, LP gas and Ng with a share of 1.8% and 0.1%, respectively (see Table 3.5).

**TABLE 3. 4. DEMAND OF GASOLINES, LP GAS, AUTOGAS AND COMPRESSED NATURAL GAS, AND DIESEL IN THE MOTOR-CARRIER SECTOR, 2016-2031.**  
(MMCFDNGE)

Year	Gasoline	Diesel	Gas LP	Compressed Natural Gas	Total
2016	3,952.2	1,865.1	155.1	2.8	5,975.2
2017	3,909.9	1,920.8	155.0	3.2	5,988.9
2018	3,986.0	1,969.1	151.0	3.4	6,109.5
2019	4,043.4	2,026.4	149.2	3.7	6,222.7
2020	4,100.5	2,080.3	150.1	4.1	6,335.0
2021	4,164.8	2,152.4	151.3	4.4	6,472.9
2022	4,258.8	2,219.9	152.1	4.8	6,635.6
2023	4,331.1	2,272.6	151.3	5.1	6,760.1
2024	4,395.0	2,316.1	150.1	5.4	6,866.6
2025	4,467.0	2,366.6	148.1	5.6	6,987.4
2026	4,526.1	2,418.8	146.1	5.7	7,096.7
2027	4,582.6	2,471.1	144.2	5.8	7,203.8
2028	4,616.2	2,515.7	142.1	5.9	7,279.8
2029	4,663.8	2,564.3	140.2	6.0	7,374.2
2030	4,703.2	2,609.7	137.7	6.0	7,456.7
2031	4,738.7	2,646.7	134.8	5.9	7,526.1
<b>AAGR</b>	<b>1.2</b>	<b>2.4</b>	<b>-0.9</b>	<b>5.0</b>	<b>1.6</b>

Source: SENER with information from IMP.

### 3.3 Regional Natural Gas Demand

In 2031, the NG demand will reach a volume of 9,659.9 MMCFD, an increase of 26.8% regarding 2016. It is expected that in 2031 the NG demand in the Northeast region reaches a volume of 3,170.8 MMCFD, being Nuevo Leon the entity with the largest demand, 1,172.9 MMCFD; on the contrary, Coahuila will have the smallest demand with 255.5 MMCFD.

The South-Southeast region will reach a demand of 2,812.3 MMCFD in 2031, the federal entity with the largest demand will be Veracruz with 1,353.7 MMCFD, while the federal entity with the smallest demand will be Quintana Roo, with 1.7 MMCFD. The increases in the demand are because the Quinquennial Plan for the Expansion of the SISTRANGAS considers projects of pipelines in the states of Veracruz, Oaxaca, and Chiapas, which will contribute to serve the need for this fuel.

In 2031, the Central-Western gas demand will reach a volume of 1,478.3 MMCFD, being San Luis Potosi with a demand of 448.9 MMCFD; on the contrary, Zacatecas will display the smallest demand, 10.3 MMCFD. The increase of the gas demand in this region is due to the construction of new gas pipelines in Aguascalientes, Jalisco, Michoacán and Zacatecas.

The Central Region demand will reach 882.6 MMCFD, where the State of Mexico will have the largest demand, 363.9 MMCFD; on the contrary, Tlaxcala, with 43.1 MMCFD will be the smallest consumer. The increases in these regions are the result of the pipelines' startup in the states of Hidalgo and Puebla, which will contribute to serve the NG demand in generating plants in Hidalgo, State of Mexico, and Morelos.

Finally, the NG demand in the Northwest region will be of 1,315 MMCFD, being California the state with the largest demand, 481.8 MMCFD, and Sonora the one with the smallest demand, 406.7 MMCFD. This

region's increase is due to the startup of new combined-cycle generation plants in Baja California, Sonora, and Sinaloa, with investments under schemes of IEP and PFW<sup>42</sup>.

**TABLE 3. 5. REGIONAL NATURAL GAS CONSUMPTION BY STATE, 2016-2031.**  
(MMCFD)

State	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
<b>Domestic Total</b>	<b>7,618.7</b>	<b>8,017.0</b>	<b>8,322.2</b>	<b>9,011.5</b>	<b>9,273.8</b>	<b>9,303.2</b>	<b>9,384.8</b>	<b>9,265.7</b>	<b>9,392.5</b>	<b>9,508.0</b>	<b>9,673.6</b>	<b>9,674.8</b>	<b>9,867.0</b>	<b>9,827.7</b>	<b>9,755.3</b>	<b>9,659.9</b>	<b>1.6</b>
<b>Northwest</b>	<b>608.1</b>	<b>639.7</b>	<b>668.3</b>	<b>958.6</b>	<b>1,065.1</b>	<b>1,089.3</b>	<b>1,121.1</b>	<b>1,098.7</b>	<b>1,167.7</b>	<b>1,187.9</b>	<b>1,183.9</b>	<b>1,195.9</b>	<b>1,232.8</b>	<b>1,326.7</b>	<b>1,333.4</b>	<b>1,315.9</b>	<b>5.3</b>
Baja California	330.7	283.9	286.5	285.5	258.3	264.8	321.4	321.6	432.4	440.0	438.7	440.7	506.6	511.0	488.9	481.8	2.5
Sinaloa		71.1	71.2	311.4	358.0	359.9	352.5	331.0	331.8	333.3	334.1	335.0	339.2	426.8	427.1	427.5	n.a.
Sonora	277.4	284.6	310.6	361.6	448.9	464.6	447.2	446.1	403.5	414.6	411.1	420.3	391.2	389.0	417.5	406.7	2.6
<b>Northeast</b>	<b>2,499.5</b>	<b>2,580.1</b>	<b>2,819.6</b>	<b>2,909.6</b>	<b>2,965.7</b>	<b>2,905.9</b>	<b>2,927.3</b>	<b>2,895.6</b>	<b>2,880.6</b>	<b>2,877.4</b>	<b>3,002.1</b>	<b>3,038.2</b>	<b>3,219.4</b>	<b>3,163.6</b>	<b>3,170.8</b>	<b>3,170.8</b>	<b>1.6</b>
Chihuahua	333.6	339.3	423.4	450.1	451.3	453.1	450.1	457.4	454.5	458.0	573.2	584.5	603.9	518.8	523.1	525.7	3.1
Coahuila	273.2	255.9	243.4	243.5	250.1	251.3	253.7	255.1	252.8	256.4	252.4	255.1	254.7	256.3	256.5	255.5	-0.4
Durango	184.2	206.2	205.2	207.9	213.1	198.2	190.3	190.0	191.1	190.5	191.2	191.2	297.2	298.6	302.9	300.8	3.3
Nuevo León	780.2	877.5	993.5	1,077.9	1,087.2	1,025.9	1,032.3	1,001.6	1,001.8	1,011.4	1,024.1	1,058.2	1,105.1	1,160.0	1,191.0	1,172.9	2.8
Tamaulipas	928.3	901.3	954.0	930.1	963.9	977.4	1,000.8	991.5	980.5	961.0	961.2	949.3	958.4	930.0	897.3	915.8	-0.1
<b>Central - Occidente</b>	<b>1,203.1</b>	<b>1,068.4</b>	<b>1,093.7</b>	<b>1,162.4</b>	<b>1,235.0</b>	<b>1,275.0</b>	<b>1,252.7</b>	<b>1,257.9</b>	<b>1,259.7</b>	<b>1,356.6</b>	<b>1,488.8</b>	<b>1,493.4</b>	<b>1,487.0</b>	<b>1,490.1</b>	<b>1,492.8</b>	<b>1,478.3</b>	<b>1.4</b>
Aguascalientes	35.1	36.8	37.9	38.8	39.8	40.8	41.8	42.6	43.4	44.2	45.0	45.7	46.4	47.1	47.7	48.4	2.2
Colima	253.2	208.3	208.3	208.3	207.7	208.3	208.3	208.3	207.7	208.3	208.3	208.3	207.7	208.3	208.3	208.3	-1.3
Guanajuato	309.5	211.1	229.9	280.7	282.4	283.9	286.0	288.9	288.3	289.9	290.8	291.9	292.3	293.2	293.8	294.5	-0.3
Jalisco	89.3	92.7	94.4	96.0	155.2	174.0	177.2	178.5	179.6	180.6	181.3	182.1	182.4	182.5	184.0	170.2	4.4
Michoacán	132.5	136.2	140.2	144.3	144.8	145.4	145.7	145.9	146.1	146.3	146.4	146.5	146.6	146.6	146.8	146.8	0.7
Querétaro	147.0	144.9	141.0	144.3	148.3	151.8	152.2	152.9	153.3	153.6	152.9	154.1	152.1	151.0	150.9	150.9	0.2
San Luis Potosí	226.5	228.6	232.1	240.0	246.7	260.6	231.1	230.5	230.8	323.3	453.8	454.4	449.0	451.0	451.0	448.9	4.7
Zacatecas	10.1	9.8	9.9	10.0	10.1	10.2	10.3	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.3	0.2
<b>Central</b>	<b>885.1</b>	<b>916.2</b>	<b>946.8</b>	<b>1,031.6</b>	<b>984.7</b>	<b>966.6</b>	<b>984.1</b>	<b>917.7</b>	<b>836.7</b>	<b>837.0</b>	<b>837.8</b>	<b>839.6</b>	<b>870.1</b>	<b>870.0</b>	<b>881.9</b>	<b>882.6</b>	<b>0.0</b>
Ciudad de México	72.2	61.9	61.5	63.9	66.6	69.8	72.0	73.5	75.1	76.4	77.7	78.9	79.7	79.3	81.4	80.8	0.8
Hidalgo	238.0	266.5	268.4	299.7	271.3	242.4	246.9	184.8	126.0	128.1	128.3	128.4	126.6	126.6	126.6	126.6	-4.1
México	341.8	287.4	311.0	351.5	379.5	383.6	389.1	389.5	369.2	364.6	365.5	366.3	371.4	363.6	365.2	363.9	0.4
Morélos	22.3	79.6	83.2	83.3	32.1	30.5	31.2	27.4	26.8	26.0	24.9	23.8	50.1	58.2	66.6	68.1	7.7
Puebla	176.2	183.9	184.4	193.6	195.0	199.5	203.3	200.9	197.8	199.8	198.9	199.4	199.4	199.7	199.9	200.1	0.9
Tlaxcala	34.7	36.8	38.3	39.7	40.3	40.8	41.5	41.7	41.8	42.2	42.5	42.8	43.0	42.6	42.3	43.1	1.5
<b>South-Southeast</b>	<b>2,422.8</b>	<b>2,812.6</b>	<b>2,793.9</b>	<b>2,949.4</b>	<b>3,023.2</b>	<b>3,066.4</b>	<b>3,099.8</b>	<b>3,095.8</b>	<b>3,247.8</b>	<b>3,249.1</b>	<b>3,161.1</b>	<b>3,107.6</b>	<b>3,057.7</b>	<b>2,977.3</b>	<b>2,876.4</b>	<b>2,812.3</b>	<b>1.0</b>
Campeche	482.1	667.1	667.2	677.6	686.8	696.0	698.4	663.5	656.9	650.4	626.7	596.6	569.3	539.2	507.7	459.5	-0.3
Chiapas	63.0	69.5	68.2	49.4	50.7	57.9	72.8	67.5	149.2	139.6	132.8	124.1	119.6	118.6	113.3	111.3	3.9
Oaxaca	0.0	32.3	32.3	95.6	95.5	95.6	95.8	95.6	95.5	95.6	95.6	95.6	95.6	162.4	161.9	162.4	72.5
Quintana Roo											2.6	2.6	2.5	2.5	2.5	1.7	n.a.
Tabasco	803.4	786.3	784.6	779.9	792.9	812.5	830.9	868.3	851.1	855.9	816.4	766.3	726.8	682.3	627.8	564.1	-2.3
Veracruz	968.2	1,154.1	1,125.6	1,234.0	1,269.3	1,272.2	1,280.8	1,234.7	1,345.9	1,356.4	1,352.3	1,340.1	1,361.7	1,334.9	1,313.4	1,353.7	2.3
Yucatán	106.1	103.4	116.1	112.9	127.9	132.2	121.0	166.1	149.1	148.6	134.8	182.5	182.2	139.4	149.8	159.7	2.8

Source: SENER with information from IMP.

### 3.4 Natural Gas Production

The estimate of the NG production platform is displayed in two scenarios according to the following classification:

- **Minimum:**
  - Extraction component: 2P reserves
  - Exploration component: 2P reserves
- **Maximum:**
  - Extraction component: 3P reserves
  - Exploration component: 3P reserves

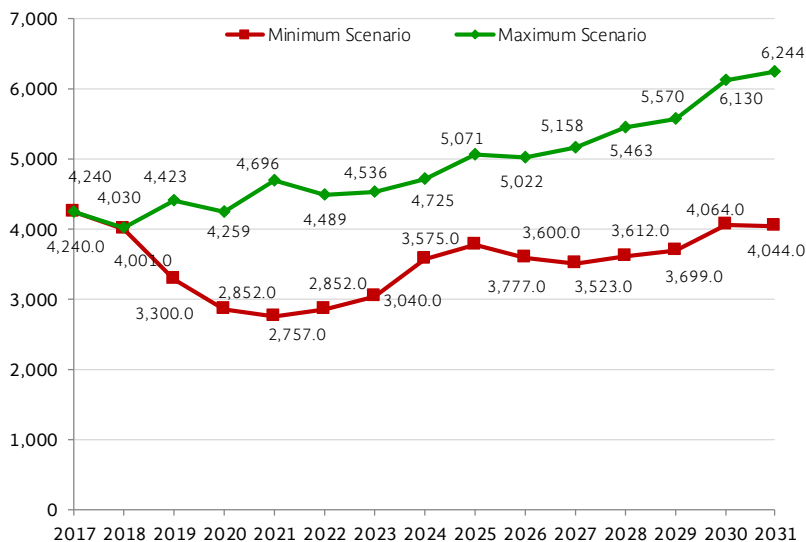
The gas production for the maximum scenario is estimated to reach a volume of 6,244.0 MMCFD in 2031, 47.2% more regarding 2017; while for the minimum scenario is foreseen a volume of 4,044 MMCFD (see Figure 3.9).

For 2017 it was taken into account the average production recorded by PEMEX up to October of that same year. Subsequently, for the first five years (2018-2023) it was used the same platform used by the Hydrocarbons Undersecretariat to be sent to the Secretariat of Finance and Public Credit (SHCP) to estimate the incomes for the budgetary year and goals objective goals of 2018.

<sup>42</sup> Annual Report 2016, p. 55.

For the subsequent years (2024-2031), the platform was adapted based on the information from Pemex and CNH regarding the production estimated of the blocks allocated in Rounds 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, and 2.3.

**FIGURE 3. 9 GAS PRODUCTION, MAXIMUM AND MINIMUM SCENARIOS (MMCFD)**



Source: SENER with information from Pemex y CNH.  
Does not include nitrogen.

### 3.4.1 Production by Activity

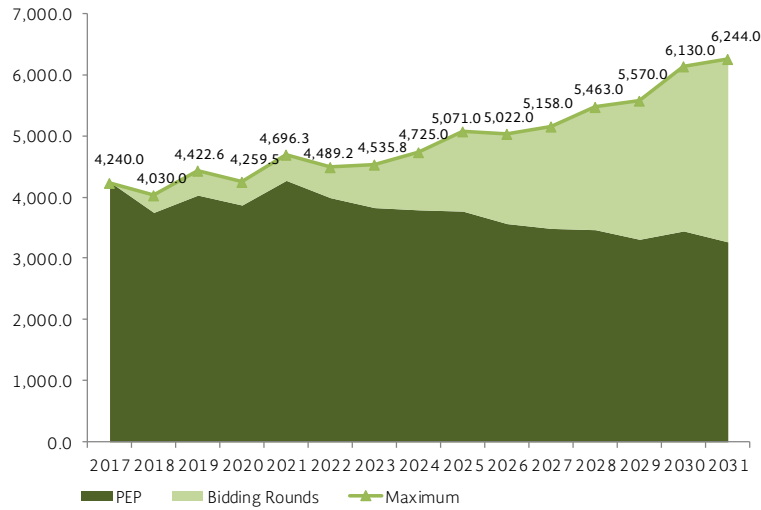
The production from Pemex Exploration and Production in 2031 includes Round Zero, Safekeeping Allocations, Migrations and Comprehensive Contracts of Exploration and Production, and is estimated that in the maximum scenario decreases 23% regarding 2017, reaching a 3,268.0 MMCFD volume, since the investment in extraction fields will be less. As for the production from the bid-winner companies, this will reach 2,976.0 MMCFD in 2031<sup>43</sup> (see Figure 3.10).

<sup>43</sup> The estimate of the NG production is based on 2017-2031 considering the 15 years which, by regulation, should be projected in the outlook, without considering the base or real year (2016) which is added in the sectorial demands.





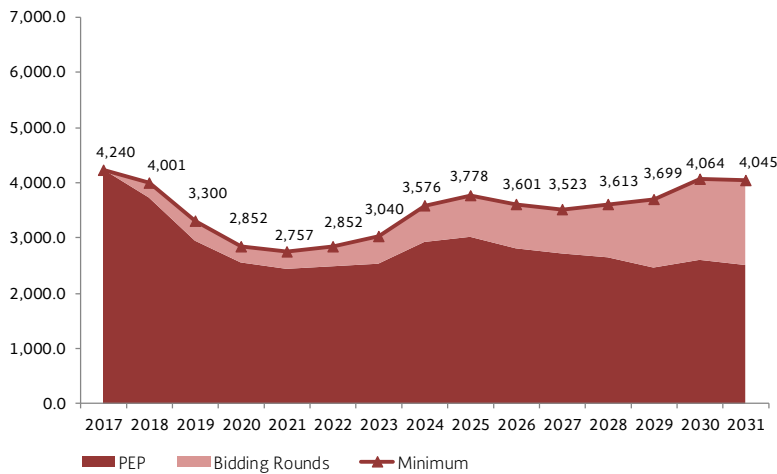
**FIGURE 3. 10 GAS PRODUCTION BY ACTIVITY, MAXIMUM SCENARIO 2017-2031 (MMCFD)**



Source: SENER with information from Pemex y CNH. Does not include nitrogen.

In the minimum scenario, the 2031 production from Pemex is estimated to decrease 40% regarding 2016, reaching a volume of 2,519 MMCFD. As for the production from bid-winner companies, this will reach a volume of 1,526.0 MMCFD in 2031 (see Figure 3.11).

**FIGURE 3. 11. GAS PRODUCTION BY ACTIVITY, MINIMUM SCENARIO 2017-2031 (MMCFD)**

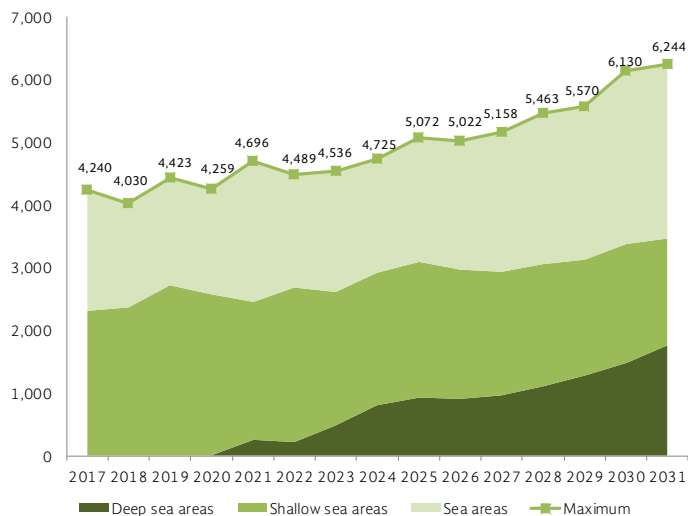


Source: SENER with information from Pemex and CNH. Does not include nitrogen.

### 3.4.2 Production by Region

In the maximum scenario, the 2031 gas production from onshore areas will increase by 44.5% regarding 2017, reaching 2,785.7 MMCFD and which will represent 44.6% of the total production. On the other hand, the production from deep and shallow water will reach a volume of 1,759.3 MMCFD and 1,699 MMCFD, respectively (see Figure 3.12).

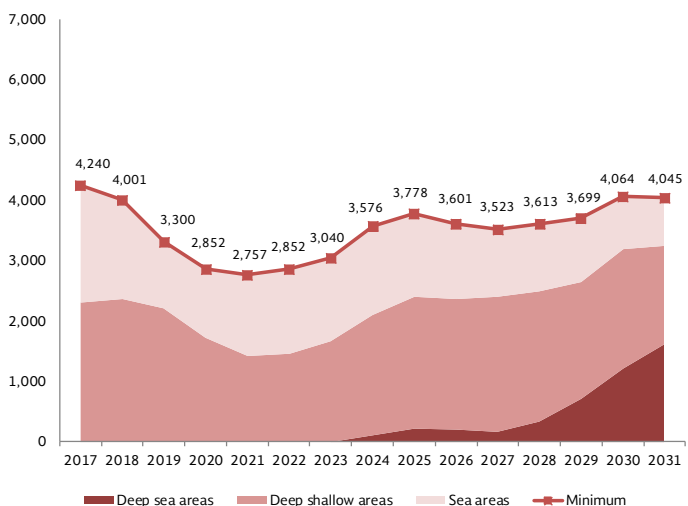
**FIGURE 3. 12. GAS PRODUCTION BY REGION, MAXIMUM SCENARIO 2017-2031 (MMCFD)**



Source: SENER with information from Pemex and CNH. Does not include nitrogen.

For the minimum scenario, the gas production from onshore areas will decrease 58.0% regarding 2017, reaching a volume of 809.1 MMCFD in 2031. As for shallow-water production, it will decrease 29.8%, estimating a volume of 1,623.7 MMCFD in that same year. Finally, the deep-water production will reach a volume of 1,612.2 MMCFD in 2031 (see Figure 3.13).

**FIGURE 3. 13. GAS PRODUCTION BY REGION, MINIMUM SCENARIO 2017-2031. (MMCFD)**



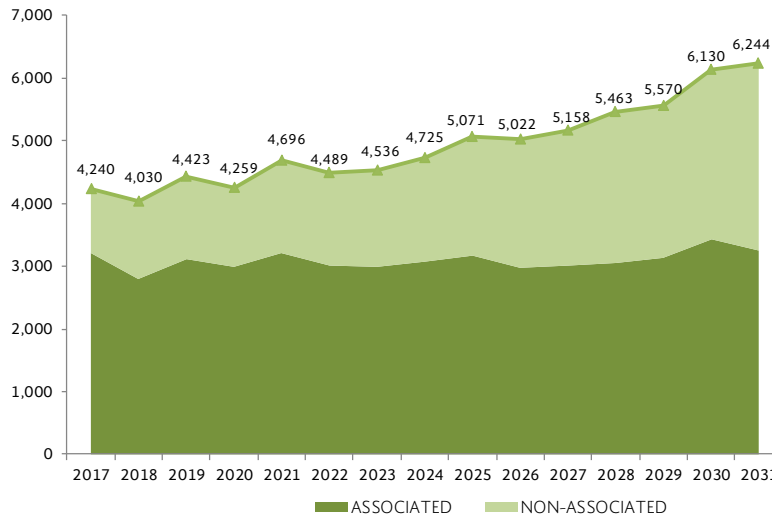
Source: SENER with information from Pemex and CNH. Does not include nitrogen.



### 3.4.3 Production by Origin

In 2031, the production of associated gas for the maximum scenario will reach a 3,255.1 MMCFD volume, a decrease of 0.9% regarding 2017. As for non-associated gas, it will reach a volume of 2,988.9 MMCFD in 2031 (see Figure 3.14).

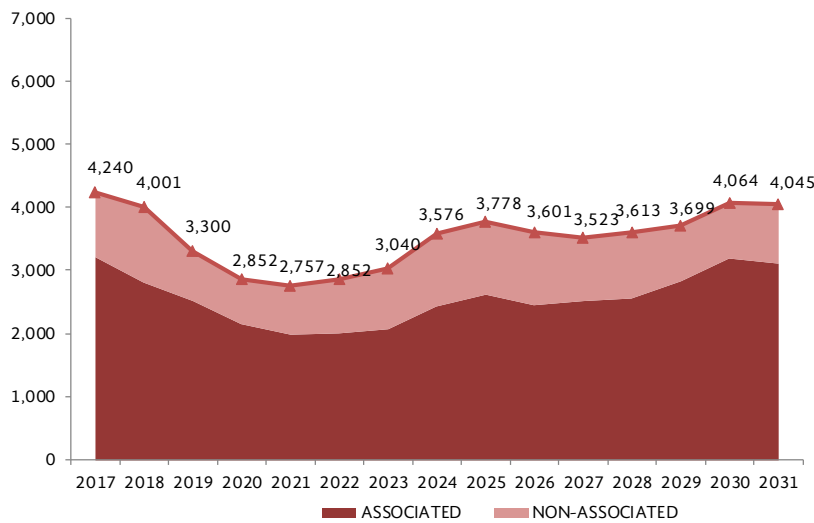
**FIGURE 3. 14 NATURAL GAS PRODUCTION BY ORIGIN, MAXIMUM SCENARIO 2017-2031.**  
(MMCFD)



Source: SENER with information from Pemex and CNH. Does not include nitrogen.

For the minimum scenario, associated gas is estimated to reach a volume of 3,111.0 MMCFD in 2031, which is a 77% share in the total production. Regarding non-associated gas, this will have a 23% share with a volume of 934.0 MMCFD (see Figure 3.15).

**FIGURE 3. 15 NATURAL GAS PRODUCTION BY ORIGIN, MINIMUM SCENARIO 2017-2031.**  
(MMCFD)



Source: SENER with information from Pemex and CNH. Does not include nitrogen.

### 3.5 Current Natural Gas Infrastructure

To March 31<sup>st</sup>, 2017, the SENER published the second annual review of the Quinquennial Plan for the Expansion of the Natural Gas Transportation and Storage Integrated System (Quinquennial Plan), which verified the validity of the projects included in the Quinquennial Plan published on October 14, 2015, according to the behavior of the NG market.

According to the second review, the seven gas pipelines allocated by the CFE and included in the Quinquennial Plan maintain their validity: (i) Tuxpan-Tula; (ii) La Laguna-Aguascalientes, (iii) Tula-Villa de Reyes; (iv) Villa de Reyes-Aguascalientes-Guadalajara; (v) San Isidro-Samalayuca; (vi) Samalayuca-Sasabe; and (vii) South Texas-Tuxpan.

Regarding the gas pipeline Jaltipan-Salina Cruz, the project's tender is adjourned for the period 2017-2018, and the startup of this infrastructure, for the period 2020-2022.

As for the gas pipeline Lazaro Cardenas-Acapulco, its developmental options are still under analysis, and its tender period is adjourned to 2017-2019, and its startup, for 2020-2022.

The adjournment of the gas pipelines Los Ramones-Cempoala was also approved for the period 2020-2024.

**TABLE 3. 6. INFRASTRUCTURE PROJECTS INCLUDED IN THE QUINQUENNIAL PLAN, 2015-2019**

#	Allocated projects included in the Quinquennial Plan 2015-2019	States Benefitted	Length* (kilometers)	Estimated Investment (million USD)*	Allocation Date*	Startup*
1	Tuxpan-Tula	Hidalgo, Puebla y Veracruz	283	458	2015	2017
2	La Laguna -Aguascalientes	Aguascalientes, Durango y Zacatecas	600	473	2016	2018
3	Tula -Villa de Reyes	Hidalgo y San Luis Potosí	420	554	2015	2018
4	Villa de Reyes - Guadalajara	Aguascalientes, Jalisco y San Luis Potosí	305	294	2016	2018
5	San Isidros -Samalayuca	Chihuahua	23	109	2015	2017
6	Samalayuca - Sásabe	Chihuahua y Sonora	650	571	2015	2017
7	Sur de Texas-Tuxpan	Tamaulipas y Veracruz	800	2,111	2016	2018
#	Projects under Assessment	States Benefitted	Length (kilometers)	Estimated Investment (million USD)**	Estimated bidding date	Startup
8	Jáltipan-Salina Cruz	Oaxaca y Veracruz	247	643	2016-2017	2018-2019
9	Lázaro Cárdenas -Acapulco	Guerrero y Michoacán	331	456	2016-2017	2018-2019
#	Other projects	States Benefitted	Length (kilometers)	Estimated Investment (million USD)	Estimated bidding date	Startup
10	Nueva Era (Midstream México)	Nuevo León	302****	n.d.	Development at their own cost and expense	2017****
11	Salina Cruz-Tapachula	Chiapas y Oaxaca	400***	442**	Development at their own cost and expense	2019
12	Los Ramones-Cempoala	Nuevo León y Veracruz	855**	1980**	2018	2020

\*According to public information issued by the CFE.

\*\*Information originally included in the Quinquennial Plan 2015-2019.

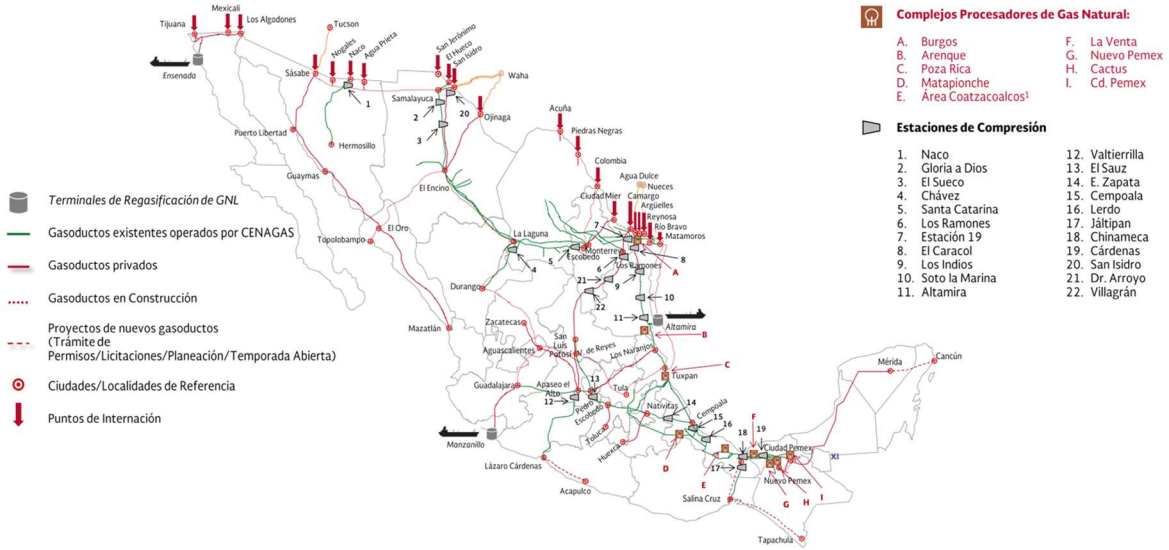
\*\*\*Length stated by TAG pipelines, S de RL de CV.

\*\*\*\*According to what was published by Howard Energy (Midstream Mexico).

Source: Second Review of the Quinquennial Plan for the Expansion of the Natural Gas Transportation and Storage Integrated System 2015-2019.



**FIGURE 3. 16 NATURAL GAS CURRENT INFRASTRUCTURE TO DECEMBER 2017**

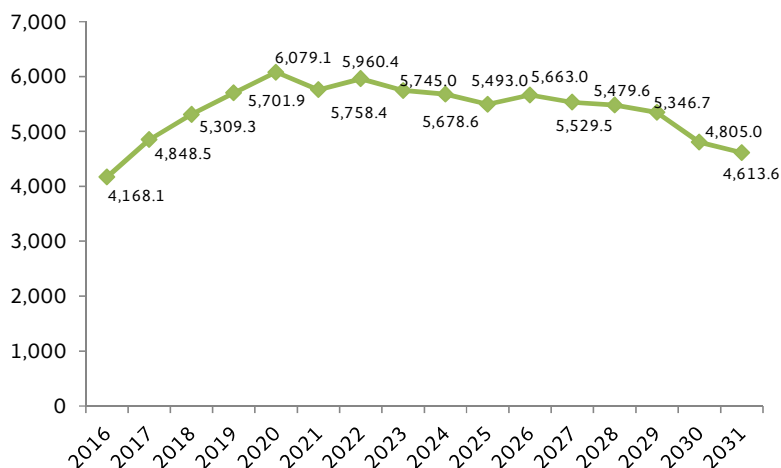


Source: Statistical Handbook December 2017. Directorate General of Natural Gas and Petrochemicals, SENER.

### 3.6 Natural Gas Foreign Trade

To serve the domestic demand in 2031 (9,659.9 MMCFD) is estimated to import a volume of 4,613.6 MMCFD, an increase by 10.6% regarding 2016; and by 2020, the maximum peak of NG imports is estimated to reach 6,079.1 MMCFD.

**FIGURE 3. 17 NATURAL GAS IMPORTS, 2016-2031.**  
(MMCFD)



Source: SENER with information from IMP.

### 3.7 Domestic Balance 2016-2031

It is estimated that by 2031, the dry-natural gas demand will reach a volume of 9,659.9 MMCFD, placing the domestic production in 5,046.3<sup>44</sup> MMCFD, 41% more regarding 2016. On the other hand, in 2031 imports will reach 4,613.6 MMCFD, while exports will be null.

In 2031, the Northeast region will display a demand of 3,170.8 MMCFD, an increase of 26.9% regarding 2016; as for its production, it will reach 694.6 MMCFD which is not sufficient to cover the regional demand and will make it necessary to resort to imports accounting for 3,297.7 MMCFD.

The Northeast region will present a demand of 1,315.1 MMCFD, an increase by 116.2% regarding 2016, but it will be necessary to resort to imports to serve its demand given that the region does not produce dry gas.

The Central and Central-Western regions do not produce dry gas, which makes it necessary resorting to imports from other regions. In the case of the Central region, its demand will be of 882.6 MMCFD in 2031; the demand in the Central-Western region will reach a volume of 1,478.3 MMCFD.

Finally, the South-Southeast region the demand will reach a volume of 2,812.3 MMCFD, and its production will be of 4,351.7 MMCFD.

<sup>44</sup> This production differs from the production estimated in the maximum and minimum scenarios of section 3.4, since for the National Balance 2016-2031 only considers dry-natural gas ready for trading, and which was elaborated based on the maximum scenario of natural gas direct from wells.

**TABLE 3. 7. NATURAL GAS DOMESTIC BALANCE, 2016-2031.**  
(MMCFD)

Concept	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
Origin	7,736.2	8,018.3	8,323.4	9,011.5	9,274.2	9,304.0	9,385.8	9,266.6	9,392.8	9,507.5	9,672.9	9,673.9	9,866.0	9,826.7	9,754.2	9,658.8	1.5
National Production	3,568.1	3,170.3	3,014.7	3,310.2	3,195.8	3,546.3	3,426.1	3,522.3	3,715.0	4,015.4	4,010.7	4,145.3	4,387.4	4,481.0	4,950.3	5,046.3	2.3
Import	4,168.1	4,848.0	5,308.8	5,701.3	6,078.4	5,757.7	5,959.7	5,744.3	5,677.9	5,492.1	5,662.1	5,528.6	5,478.6	5,345.7	4,804.0	4,612.5	0.7
Destination	7,621.3	8,018.8	8,324.0	9,012.1	9,274.9	9,304.7	9,386.5	9,267.3	9,393.6	9,508.4	9,673.7	9,674.8	9,867.0	9,827.7	9,755.3	9,659.9	1.6
Domestic Demand	7,618.7	8,017.0	8,322.2	9,011.5	9,273.8	9,303.2	9,384.8	9,265.7	9,392.5	9,508.0	9,673.6	9,674.8	9,867.0	9,827.7	9,755.3	9,659.9	1.6
Oil Sector	2,034.8	2,006.4	2,006.4	2,290.9	2,309.1	2,273.4	2,305.1	2,210.4	2,176.3	2,124.8	2,044.4	1,947.8	1,868.9	1,778.4	1,680.5	1,546.7	-1.8
Industrial Sector	1,484.1	1,496.8	1,593.0	1,749.1	1,832.6	1,853.1	1,873.1	1,890.5	1,907.3	1,919.4	1,930.9	1,941.7	1,949.2	1,954.3	1,958.3	1,964.1	1.9
Electricity Sector	3,965.7	4,376.7	4,580.0	4,822.7	4,977.7	5,016.6	5,041.3	4,994.6	5,133.9	5,284.4	5,514.6	5,597.4	5,857.2	5,899.4	5,917.2	5,947.2	2.7
Residential Sector	94.8	96.6	100.6	104.8	108.5	111.9	115.0	117.7	120.3	122.6	124.8	126.8	128.7	130.4	132.0	132.8	2.3
Services Sector	36.4	37.5	38.8	40.4	41.9	43.8	45.6	47.4	49.3	51.2	53.2	55.2	57.2	59.2	61.2	63.3	3.8
Motor-Carrier Sector	2.8	3.2	3.4	3.7	4.1	4.4	4.8	5.1	5.4	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.0
Export	2.6	1.8	1.8	0.5	1.1	1.5	1.7	1.6	1.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	n.a.
Inventories variations and differences	114.9	-0.5	-0.5	-0.6	-0.6	-0.7	-0.7	-0.7	-0.8	-0.8	-0.9	-0.9	-1.0	-1.0	-1.1	-1.1	n.a.

Source: SENER with information from IMP, based on information from CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, Sener and private companies.

## ANNEXES

**TABLE A. 1. NG DOMESTIC DEMAND BY SECTOR, 2006-2016**  
(MMCFD)

Year	Natural Gas Demand by sector						Total
	Oil	Industrial	Electricity	Residential	Services	Motor-Carrier	
2006	2,159.6	1,014.0	2,389.6	84.5	23.3	2.0	5,672.9
2007	2,125.4	1,040.1	2,645.9	88.5	24.2	1.9	5,925.9
2008	2,174.9	1,026.6	2,794.0	87.4	25.3	1.7	6,109.9
2009	2,149.4	912.8	2,932.8	82.9	24.5	1.5	6,104.0
2010	2,236.6	1,054.3	2,936.3	85.7	26.6	1.4	6,340.9
2011	2,186.2	1,129.2	3,088.4	81.7	25.2	1.5	6,512.2
2012	2,273.1	1,181.1	3,111.5	84.1	27.0	1.8	6,678.4
2013	2,272.2	1,239.9	3,322.7	86.7	28.5	2.4	6,952.4
2014	2,275.6	1,313.5	3,500.3	87.8	29.9	2.3	7,209.3
2015	2,200.0	1,376.2	3,797.6	94.6	33.3	2.4	7,504.1
2016	2,122.0	1,484.1	3,878.5	94.8	36.4	2.8	7,618.7
<b>AAGR 2006-2016</b>	<b>-0.2</b>	<b>3.9</b>	<b>5.0</b>	<b>1.2</b>	<b>4.6</b>	<b>3.4</b>	<b>3.0</b>

Source: SENER, based on information from IMP.

**TABLE A. 2. ELECTRICITY SECTOR FUELS DOMESTIC DEMAND, 2006-2016**  
(MMCFDNGE)

Year	Natural Gas	Fuel Oil	Diesel	Coal	Petroleum Coke
2006	2,389.6	1,335.8	45.1	837.5	85.6
2007	2,645.9	1,312.9	25.9	830.0	85.1
2008	2,794.0	1,144.6	39.2	539.5	81.9
2009	2,932.8	1,115.5	49.8	777.7	81.7
2010	2,936.3	1,000.0	46.2	849.3	100.7
2011	3,088.4	1,119.7	54.8	888.8	97.6
2012	3,111.5	1,249.5	81.5	886.2	100.8
2013	3,322.7	1,114.8	80.3	838.9	103.1
2014	3,500.3	720.0	55.2	855.3	102.7
2015	3,797.6	637.5	53.6	903.4	100.7
2016	3,878.5	710.7	64.9	898.7	89.1
<b>AAGR</b>	<b>5.0</b>	<b>-6.1</b>	<b>3.7</b>	<b>0.7</b>	<b>0.4</b>

Source: SENER, based on information from IMP.





**TABLE A. 3. MOTOR-CARRIER SECTOR FUELS DEMAND, 2006-2016**  
(MMCFDNGE)

Year	LP Gas	Compressed Natural Gas	Gasoline	Diesel	Total
2006	109.0	2.0	3,449.5	1,651.6	5,212.0
2007	118.3	1.9	3,651.3	1,748.1	5,519.5
2008	113.1	1.7	3,803.6	1,853.7	5,772.0
2009	108.2	1.5	3,803.1	1,756.4	5,669.2
2010	109.0	1.4	3,849.8	1,809.6	5,769.8
2011	112.8	1.5	3,837.8	1,836.7	5,788.7
2012	131.1	1.8	3,857.3	1,892.0	5,882.1
2013	144.0	2.4	3,779.0	1,855.9	5,781.2
2014	153.1	2.3	3,728.2	1,874.0	5,757.6
2015	160.8	2.4	3,807.7	1,836.8	5,807.6
2016	155.1	2.8	3,952.2	1,865.1	5,975.2
<b>AAGR 2006-2016</b>	<b>3.60</b>	<b>3.4</b>	<b>1.4</b>	<b>1.2</b>	

Source: SENER, based on information from IMP.

**TABLE A. 4. INDUSTRIAL SECTOR FUELS DEMAND, 2006-2016**  
(MMCFDNGE)

Year	Fuels Industrial Sector						
	Natural Gas	Fuel Oil	Diesel	LP Gas	Petroleum Coke	Coal	Total
	MMCFD	MMCFDNGE	MMCFDNGE	MMCFDNGE	MMCFDNGE	MMCFDNGE	MMCFDNGE
2006	1,014.0	305.3	141.0	115.8	300.9	-	1,877.1
2007	1,040.1	285.0	143.7	113.1	348.3	133.8	2,064.0
2008	1,026.6	222.0	147.6	106.1	302.0	259.8	2,064.0
2009	912.8	186.5	133.7	106.8	250.2	170.2	1,760.1
2010	1,054.3	150.7	141.9	112.1	232.9	424.8	2,116.6
2011	1,129.2	130.2	158.4	106.3	254.6	381.8	2,160.5
2012	1,181.1	89.5	182.0	106.6	262.6	374.0	2,195.8
2013	1,239.9	68.1	179.1	116.8	317.2	484.6	2,405.8
2014	1,313.5	40.6	170.4	117.0	301.0	387.8	2,330.3
2015	1,376.2	57.8	172.2	122.0	339.1	352.9	2,420.3
2016	1,484.1	84.9	152.5	122.6	362.9	379.0	2,586.0
<b>AAGR</b>	<b>3.9</b>	<b>-12.0</b>	<b>0.8</b>	<b>0.6</b>	<b>1.9</b>	<b>-7.9</b>	

Source: SENER, based on information from IMP.

**TABLE A. 5 OIL SECTOR FUELS DEMAND, 2006-2016**  
(MMCFDNGE)

Year	Fuels Oil Sector					
	Natural Gas	Fuel Oil	Diesel	LP Gas	Gasoline	Total
	MMCFD	MMCFDNGE	MMCFDNGE	MMCFDNGE	MMCFDNGE	MMCFDNGE
2006	2,160	235	87	20	3	2,504.6
2007	2,125	231	99	22	3	2,480.4
2008	2,175	226	102	20	3	2,525.3
2009	2,149	208	115	19	3	2,494.7
2010	2,237	178	111	16	3	2,544.4
2011	2,186	190	102	18	4	2,500.2
2012	2,273	150	115	17	6	2,560.6
2013	2,272	162	129	10	6	2,578.9
2014	2,276	152	120	20	10	2,577.7
2015	2,200	142	115	16	9	2,481.4
2016	2,122	124.2	59.6	6.5	4.6	2,316.8
<b>AAGR</b>	<b>-0.2</b>	<b>-6.2</b>	<b>-3.7</b>	<b>-10.7</b>	<b>3.6</b>	<b>-17.2</b>

Source: SENER, based on information from IMP.

**TABLE A. 6. RESIDENTIAL SECTOR FUELS DOMESTIC DEMAND, 2006-2016**  
(MMCFDNGE)

Year	Fuels Residential Sector			Total
	Natural Gas	LP Gas	Firewood	
	MMCFD	MMCFDNGE	MMCFDNGE	MMCFDNGE
2006	84.5	769.0	488.5	1,342.0
2007	88.5	760.8	485.6	1,334.8
2008	87.4	744.0	481.9	1,313.2
2009	82.9	708.4	480.8	1,272.2
2010	85.7	726.2	477.6	1,289.5
2011	81.7	718.1	471.0	1,270.7
2012	84.1	693.7	462.3	1,240.1
2013	86.7	657.9	455.8	1,200.4
2014	87.8	646.0	447.7	1,181.4
2015	94.6	622.1	439.1	1,155.9
2016	94.8	632.6	430.7	1,158.1
<b>AAGR</b>				
<b>2006-2016</b>	<b>1.2</b>	<b>-1.9</b>	<b>-1.3</b>	

Source: SENER, based on information from IMP.

**TABLE A. 7. SERVICES SECTOR FUELS DOMESTIC DEMAND, 2006-2016**  
(MMCFDNGE)

Year	Fuels Services Sector			Total
	Natural Gas	LP Gas	Firewood	
	MMCFD	MMCFDNGE	MMCFDNGE	MMCFDNGE
2006	23.3	177.9	78.2	279.3
2007	24.2	164.8	77.7	266.7
2008	25.3	156.9	77.1	259.3
2009	24.5	157.1	76.9	258.5
2010	26.6	161.0	76.4	264.0
2011	25.2	158.4	75.4	259.0
2012	27.0	168.0	74.0	268.9
2013	28.5	171.0	72.9	272.4
2014	29.9	165.6	71.6	267.1
2015	33.3	164.2	70.3	267.7
2016	36.4	166.7	68.9	272.0
<b>AAGR 2006-2016</b>	<b>4.6</b>	<b>-0.6</b>	<b>-1.3</b>	

Source: SENER, based on information from IMP.

**TABLE A. 8. REGIONAL COMPOSITION OF THE VEHICLE FLEET BY FUEL, 2006-2016**  
(thousand units)

Fuel	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006-2016
Compressed Natural Gas	2.92	2.75	2.81	1.81	1.47	1.52	1.57	4.30	3.07	3.14	3.62	2.2
Gasoline	18,476	20,303	22,067	22,961	24,087	25,488	26,788	28,227	28,477	29,595	30,153	5.0
LP Gas	235	221	196	185	185	203	232	250	254	250	249	0.6
Diesel	701	738	774	780	791	799	845	898	855	833	808	1.4
<b>Total</b>	<b>19,415</b>	<b>21,265</b>	<b>23,040</b>	<b>23,929</b>	<b>25,065</b>	<b>26,492</b>	<b>27,866</b>	<b>29,379</b>	<b>29,588</b>	<b>30,681</b>	<b>31,214</b>	<b>4.9</b>

Source: SENER, based on information from IMP.

**TABLE A. 9. INDUSTRIAL SECTOR NG DOMESTIC CONSUMPTION, 2006-2016**  
(MMCFD)

Branch	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006-2016
<b>Total</b>	<b>1,014.0</b>	<b>1,040.1</b>	<b>1,026.6</b>	<b>912.8</b>	<b>1,054.3</b>	<b>1,129.2</b>	<b>1,181.1</b>	<b>1,239.9</b>	<b>1,313.5</b>	<b>1,376.2</b>	<b>1,484.1</b>	<b>3.9</b>
Food	92.3	95.9	96.0	102.9	111.5	122.8	132.6	125.7	132.0	130.0	134.0	3.8
Cellulose and paper	63.8	65.2	69.9	62.9	63.8	63.6	76.8	83.8	81.4	90.1	96.6	4.2
Cemento	18.1	10.7	8.7	11.7	9.6	8.5	17.4	11.4	13.4	13.2	15.8	-1.4
Beer and malt	18.9	16.6	17.7	15.8	16.2	18.6	22.0	39.1	34.9	38.3	36.1	6.7
Basic metals	293.6	305.6	299.3	223.4	287.5	301.4	299.2	326.1	340.4	347.4	347.6	1.7
Mining	23.8	22.4	20.3	17.5	21.4	21.6	23.1	23.8	17.2	14.2	23.8	0.0
Non-metallic mineral products	68.3	69.4	66.2	58.2	74.2	80.9	82.6	83.1	80.1	86.6	90.2	2.8
Metallic products, electric and transportation equipment	106.9	111.2	106.3	95.0	110.6	124.6	130.1	123.3	135.2	137.7	145.2	3.1
Chemical	127.1	131.7	132.3	135.2	155.8	165.6	167.3	170.0	204.4	200.4	240.9	6.6
Rest*	61.6	65.3	59.0	51.9	63.4	71.3	72.0	91.1	99.4	144.0	178.0	11.2
Textile	33.9	35.0	34.4	34.4	35.3	37.8	37.6	38.0	39.3	41.8	43.5	2.5
Glass	105.6	111.1	116.6	104.0	105.0	112.6	120.4	124.5	136.0	132.5	132.6	2.3

Source: IMP, based on information from CRE, PGPB and private companies.

**TABLE A. 10. OIL SECTOR NG CONSUMPTION, 2006-2016**  
(MMCFD)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006-2016
<b>Total</b>	<b>2,160</b>	<b>2,125</b>	<b>2,175</b>	<b>2,149</b>	<b>2,237</b>	<b>2,186</b>	<b>2,273</b>	<b>2,272</b>	<b>2,276</b>	<b>2,200</b>	<b>2,122</b>	<b>-0.2</b>
Corporate	0.5	0.5	0.4	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	-3.2
Refining	279.5	282.4	306.0	299.3	337.8	332.9	343.5	348.8	375.7	385.3	342.1	2.0
Gas and Basic Petrochemistry	262.9	268.4	287.6	291.4	289.0	292.0	274.8	213.4	196.1	182.1	176.3	-3.9
Exploration and Production 1	1,324.8	1,251.2	1,236.4	1,239.8	1,289.4	1,240.9	1,313.8	1,288.8	1,285.4	1,254.7	1,245.5	-0.6
Petrochemistry	292.0	322.9	344.5	318.4	319.9	320.0	340.6	349.1	332.0	236.1	38.3	-18.4
Nuevo Pemex Cogeneration	-	-	-	-	-	-	-	71.8	86.1	87.6	87.2	n.a.
Sales to Pemex Fertilizer										19.4	77.2	n.a.
Sales to Pemex Ethylene										34.4	155.1	n.a.

<sup>1</sup> Includes the consumption of the Nitrogen Company of Cantarell.  
Source: Elaborated by IMP, based on information from PEMEX.

**TABLE A. 11. NG DEMAND BY SECTOR, 2016-2031**  
(MMCFD)

Sector	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
Total	7,618.7	8,017.0	8,322.2	9,011.5	9,273.8	9,303.2	9,384.8	9,265.7	9,392.5	9,508.0	9,673.6	9,674.8	9,867.0	9,827.7	9,755.3	9,659.9	0.0
Oil	2,034.8	2,006.4	2,006.4	2,290.9	2,309.1	2,273.4	2,305.1	2,210.4	2,176.3	2,124.8	2,044.4	1,947.8	1,868.9	1,778.4	1,680.5	1,546.7	-1.8
Electricity	3,965.7	4,376.7	4,580.0	4,822.7	4,977.7	5,016.6	5,041.3	4,994.6	5,133.9	5,284.4	5,514.6	5,597.4	5,857.2	5,899.4	5,917.2	5,947.2	2.7
Industrial <sup>1</sup>	1,484.1	1,496.8	1,593.0	1,749.1	1,832.6	1,853.1	1,873.1	1,890.5	1,907.3	1,919.4	1,930.9	1,941.7	1,949.2	1,954.3	1,958.3	1,964.1	1.9
Residential	94.8	96.6	100.6	104.8	108.5	111.9	115.0	117.7	120.3	122.6	124.8	126.8	128.7	130.4	132.0	132.8	2.3
Services	36.4	37.5	38.8	40.4	41.9	43.8	45.6	47.4	49.3	51.2	53.2	55.2	57.2	59.2	61.2	63.3	3.8
Vehicle Transportation	2.8	3.2	3.4	3.7	4.1	4.4	4.8	5.1	5.4	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.0

<sup>1</sup> Includes Ethylene Project XXI.  
Source: IMP, based on BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, PEMEX, SENER and private companies.

**TABLE A. 12. ELECTRICITY SECTOR FUELS DEMAND, 2016-2031**  
(MMCFDNGE)

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
<b>Total</b>	<b>5,768.5</b>	<b>6,441.3</b>	<b>6,440.4</b>	<b>6,453.0</b>	<b>6,547.2</b>	<b>6,632.2</b>	<b>6,562.5</b>	<b>6,499.9</b>	<b>6,591.1</b>	<b>6,741.1</b>	<b>6,990.0</b>	<b>7,073.3</b>	<b>7,286.8</b>	<b>7,239.5</b>	<b>7,204.0</b>	<b>7,244.2</b>	<b>1.5</b>
Coal	938.2	1,023.2	1,023.2	1,046.8	1,050.8	1,156.3	1,156.3	1,156.3	1,155.8	1,156.3	1,156.3	1,156.3	1,108.3	1,010.3	960.5	959.9	0.2
Fuel Oil	710.7	813.2	635.5	393.7	317.3	265.9	188.1	161.8	125.5	120.9	142.0	141.7	147.9	165.6	165.6	178.3	-8.8
Diesel	64.9	110.5	83.9	71.9	83.9	75.6	59.0	69.3	58.3	61.7	59.2	60.1	55.9	46.2	42.8	41.0	-3.0
Petroleum Coke	89.1	117.9	117.9	117.9	117.5	117.9	117.9	117.9	117.5	117.9	117.9	117.9	117.5	117.9	117.9	117.8	1.9
Natural Gas	3,965.7	4,376.7	4,580.0	4,822.7	4,977.7	5,016.6	5,041.3	4,994.6	5,133.9	5,284.4	5,514.6	5,597.4	5,857.2	5,899.4	5,917.2	5,947.2	2.7

Source: IMP, based on information from CFE, CRE, INEGI, Pemex, SENER and private companies.

**TABLE A. 13. FUELS DOMESTIC DEMAND IN THE INDUSTRIAL SECTOR, 2016-2031**  
(MMCFDNGE)

Year	Natural Gas	Fuel Oil	LP Gas	Diesel	Petroleum Coke	Coal	Total
2016	1,484.1	84.9	122.6	152.5	362.9	379.0	2,586.0
2017	1,496.8	36.0	114.6	164.4	358.7	381.8	2,552.3
2018	1,593.0	24.0	113.0	165.4	383.1	384.1	2,662.5
2019	1,749.1	12.0	110.9	166.4	374.3	383.0	2,795.8
2020	1,832.6	0.0	111.2	167.9	375.8	382.1	2,869.6
2021	1,853.1	0.0	111.6	169.3	382.3	383.3	2,899.6
2022	1,873.1	0.0	112.0	170.6	388.0	383.4	2,927.1
2023	1,890.5	0.0	112.4	172.0	393.1	383.4	2,951.4
2024	1,907.3	0.0	112.9	173.4	397.1	382.3	2,973.1
2025	1,919.4	0.0	113.5	174.7	398.0	383.2	2,988.8
2026	1,930.9	0.0	114.3	176.1	401.9	383.2	3,006.4
2027	1,941.7	0.0	115.1	177.5	401.6	383.3	3,019.2
2028	1,949.2	0.0	116.1	178.9	399.4	382.3	3,025.8
2029	1,954.3	0.0	117.2	180.2	398.9	383.1	3,033.7
2030	1,958.3	0.0	118.6	181.5	397.2	382.9	3,038.5
2031	1,964.1	0.0	120.1	182.9	399.8	382.3	3,049.2
<b>AAGR</b>	<b>1.9</b>	<b>n.a.</b>	<b>1.2</b>	<b>0.6</b>	<b>-0.1</b>	<b>0.1</b>	<b>1.1</b>

Source: IMP, based on information from BANXICO, CNIAA, CONAGUA, CONUEE, CRE, EIA, EPA, IEA, INEGI, PEMEX, SE, SENER and private companies.



TABLE A. 14. FUELS DOMESTIC DEMAND IN THE OIL SECTOR, 2016-2031  
(MMCFDNGE)

Year	Natural Gas	Fuel Oil	Diesel	LP Gas	Gasolines	Total
	(MMCFD)	(MMCFDNGE)	(MMCFDNGE)	(MMCFDNGE)	(MMCFDNGE)	(MMCFDNGE)
2016	2,034.8	124.2	59.6	6.5	4.6	2,229.6
2017	2,006.4	93.1	39.9	1.8	6.5	2,147.8
2018	2,006.4	122.7	62.3	1.8	13.2	2,206.4
2019	2,290.9	140.2	84.8	7.4	19.8	2,543.1
2020	2,309.1	140.2	84.8	91.9	19.8	2,645.7
2021	2,273.4	140.2	84.8	150.1	19.8	2,668.3
2022	2,305.1	140.2	84.8	150.6	19.8	2,700.4
2023	2,210.4	140.2	84.8	149.2	19.8	2,604.4
2024	2,176.3	140.2	84.8	145.5	19.8	2,566.6
2025	2,124.8	140.2	84.8	141.9	19.8	2,511.5
2026	2,044.4	140.2	84.8	141.8	19.8	2,431.0
2027	1,947.8	140.2	84.8	141.7	19.8	2,334.3
2028	1,868.9	140.2	84.8	141.2	19.8	2,254.9
2029	1,778.4	140.2	84.8	141.5	19.8	2,164.7
2030	1,680.5	140.2	84.8	141.4	19.8	2,066.7
2031	1,546.7	140.1	84.7	141.4	19.8	1,932.7
<b>AAGR</b>	<b>-1.8</b>	<b>0.8</b>	<b>2.4</b>	<b>22.8</b>	<b>10.3</b>	<b>0.3</b>

Source: IMP with information from PEMEX.

TABLE A. 15. FUELS CONSUMPTION IN THE RESIDENTIAL SECTOR, 2016-2031  
(MMCFDNGE)

Year	Gas LP	Firewood	Natural Gas	Total
	(MMCFDNGE)	(MMCFDNGE)	(MMCFD)	(MMCFDNGE)
2016	632.6	436.9	94.8	1,164.3
2017	611.6	438.1	96.6	1,146.2
2018	599.3	431.0	100.6	1,131.0
2019	593.8	425.7	104.8	1,124.3
2020	593.0	418.8	108.5	1,120.3
2021	592.8	414.5	111.9	1,119.2
2022	592.1	408.1	115.0	1,115.2
2023	591.1	402.9	117.7	1,111.6
2024	590.5	396.0	120.3	1,106.7
2025	589.9	391.7	122.6	1,104.3
2026	589.7	386.0	124.8	1,100.4
2027	589.6	380.7	126.8	1,097.0
2028	589.7	374.2	128.7	1,092.5
2029	589.9	370.4	130.4	1,090.7
2030	590.2	363.2	132.0	1,085.4
2031	589.2	358.3	132.8	1,080.3
<b>AAGR</b>	<b>-0.5</b>	<b>-1.3</b>	<b>2.3</b>	<b>-0.5</b>

Source: Elaborated by IMP, based on information from CONAGUA, CONAPO, CONUEE, CRE, EIA, INEGI, Pemex, SENER and private companies.

**TABLE A. 16. FUELS CONSUMPTION IN THE SERVICES SECTOR, 2016-2031**  
(MMCFDNGE)

Year	Gas LP (MMCFDNGE)	Firewood (MMCFDNGE)	Natural Gas (MMCFD)	Total (MMCFDNGE)
2015	162.9	70.3	33.7	266.9
2016	166.7	69.9	36.4	273.0
2017	165.4	69.0	37.5	271.8
2018	164.9	68.1	38.8	271.8
2019	165.6	67.2	40.4	273.1
2020	166.9	66.1	41.9	274.9
2021	168.9	65.3	43.8	277.9
2022	171.3	64.5	45.6	281.3
2023	173.9	63.5	47.4	284.9
2024	176.8	62.5	49.3	288.6
2025	179.9	61.8	51.2	292.9
2026	183.3	60.9	53.2	297.4
2027	186.8	60.0	55.2	302.1
2028	190.6	59.1	57.2	306.9
2029	194.7	58.1	59.2	312.0
2030	199.0	57.4	61.2	317.6
2031	203.6	56.6	63.3	323.5
<b>AAGR</b>	<b>1.3</b>	<b>1.4</b>	<b>3.8</b>	<b>-0.2</b>

Source: Elaborated by IMP, based on information from CONAGUA, CONAPO, CONUEE, CRE, EIA, INEGI, Pemex, SENER and private companies.

**TABLE A. 17. DEMAND OF GASOLINES, FUELING LP GAS AND COMPRESSED NATURAL GAS, AND DIESEL IN THE MOTOR-CARRIER SECTOR, 2016-2031**  
(MMCFDNGE)

Year	Gasoline	Diesel	Gas LP	Compressed Natural Gas	Total
2016	3,952.2	1,865.1	155.1	2.8	5,975.2
2017	3,909.9	1,920.8	155.0	3.2	5,988.9
2018	3,986.0	1,969.1	151.0	3.4	6,109.5
2019	4,043.4	2,026.4	149.2	3.7	6,222.7
2020	4,100.5	2,080.3	150.1	4.1	6,335.0
2021	4,164.8	2,152.4	151.3	4.4	6,472.9
2022	4,258.8	2,219.9	152.1	4.8	6,635.6
2023	4,331.1	2,272.6	151.3	5.1	6,760.1
2024	4,395.0	2,316.1	150.1	5.4	6,866.6
2025	4,467.0	2,366.6	148.1	5.6	6,987.4
2026	4,526.1	2,418.8	146.1	5.7	7,096.7
2027	4,582.6	2,471.1	144.2	5.8	7,203.8
2028	4,616.2	2,515.7	142.1	5.9	7,279.8
2029	4,663.8	2,564.3	140.2	6.0	7,374.2
2030	4,703.2	2,609.7	137.7	6.0	7,456.7
2031	4,738.7	2,646.7	134.8	5.9	7,526.1
<b>AAGR</b>	<b>1.2</b>	<b>2.4</b>	<b>-0.9</b>	<b>5.0</b>	<b>1.6</b>

Source: Elaborated by IMP, based on AMDA, AMIA, ANPACT, BANXICO, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INE, INEGI, Pemex, SEMARNAT, SCT, Sener and private companies.



**TABLE A. 18. NATURAL GAS DOMESTIC BALANCE, 2006-2016**  
(MMCFD)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006-2016	
<b>Origin</b>	<b>5,703.4</b>	<b>6,070.6</b>	<b>6,256.1</b>	<b>6,228.7</b>	<b>6,462.9</b>	<b>6,562.1</b>	<b>6,732.9</b>	<b>7,009.0</b>	<b>7,253.9</b>	<b>7,614.8</b>	<b>7,736.2</b>	<b>3.1</b>	
<b>National Production</b>	<b>4,685.0</b>	<b>4,967.0</b>	<b>4,919.9</b>	<b>4,971.0</b>	<b>5,004.0</b>	<b>4,812.7</b>	<b>4,603.1</b>	<b>4,492.4</b>	<b>4,392.8</b>	<b>4,066.8</b>	<b>3,568.1</b>	<b>-2.7</b>	
<b>Import</b>	<b>1,018.4</b>	<b>1,103.6</b>	<b>1,336.1</b>	<b>1,257.7</b>	<b>1,458.9</b>	<b>1,749.4</b>	<b>2,129.8</b>	<b>2,516.6</b>	<b>2,861.1</b>	<b>3,548.0</b>	<b>4,168.1</b>	<b>15.1</b>	
<b>Destination</b>	<b>5,705.7</b>	<b>6,064.6</b>	<b>6,217.2</b>	<b>6,170.6</b>	<b>6,424.2</b>	<b>6,536.4</b>	<b>6,686.2</b>	<b>6,964.8</b>	<b>7,221.8</b>	<b>7,516.6</b>	<b>7,621.3</b>	<b>2.9</b>	
<b>Domestic Demand</b>	<b>5,672.9</b>	<b>5,925.9</b>	<b>6,109.9</b>	<b>6,104.0</b>	<b>6,340.9</b>	<b>6,512.2</b>	<b>6,678.4</b>	<b>6,952.4</b>	<b>7,209.3</b>	<b>7,504.1</b>	<b>7,618.7</b>	<b>3.0</b>	
Oil Sector	2,159.6	2,125.4	2,174.9	2,149.4	2,236.6	2,186.2	2,273.1	2,272.2	2,275.6	2,200.0	2,122.0	-0.2	
Industrial Sector	1,014.0	1,040.1	1,026.6	912.8	1,054.3	1,129.2	1,181.1	1,239.9	1,313.5	1,376.2	1,484.1	3.9	
Electricity Sector*	2,389.6	2,645.9	2,794.0	2,932.8	2,936.3	3,088.4	3,111.5	3,322.7	3,500.3	3,797.6	3,878.5	5.0	
Residential Sector	84.5	88.5	87.4	82.9	85.7	81.7	84.1	86.7	87.8	94.6	94.8	1.2	
Services Sector	23.3	24.2	25.3	24.5	26.6	25.2	27.0	28.5	29.9	33.3	36.4	4.6	
Motor-Carrier Sector	2.0	1.9	1.7	1.5	1.4	1.5	1.8	2.4	2.3	2.4	2.8	3.4	
<b>Export</b>	<b>32.7</b>	<b>138.7</b>	<b>107.4</b>	<b>66.5</b>	<b>83.3</b>	<b>24.2</b>	<b>7.8</b>	<b>12.4</b>	<b>12.5</b>	<b>12.5</b>	<b>2.6</b>	<b>-22.3</b>	
Inventories variations and differences	-	2.3	6.0	38.8	58.2	38.7	25.7	46.7	44.3	32.1	98.2	114.9	n.a.

\* Includes continuous own uses.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

**TABLE A. 19. NATURAL GAS BALANCE NORTHWEST REGION, 2006-2016**  
(MMCFD)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006-2016
<b>Origin</b>	<b>392.0</b>	<b>373.6</b>	<b>441.7</b>	<b>396.6</b>	<b>446.4</b>	<b>414.2</b>	<b>453.0</b>	<b>440.0</b>	<b>512.3</b>	<b>637.3</b>	<b>641.7</b>	<b>5.1</b>
<b>Regional Production</b>	-	-	-	-	-	-	-	-	-	-	-	-
<b>Import</b>	<b>392.0</b>	<b>373.6</b>	<b>441.7</b>	<b>396.6</b>	<b>446.4</b>	<b>414.2</b>	<b>453.0</b>	<b>440.0</b>	<b>512.3</b>	<b>637.3</b>	<b>641.7</b>	<b>5.1</b>
<b>From other regions</b>	0.00											n.a.
<b>Destination</b>	<b>391.5</b>	<b>376.3</b>	<b>428.9</b>	<b>408.3</b>	<b>444.0</b>	<b>422.2</b>	<b>452.1</b>	<b>447.0</b>	<b>505.0</b>	<b>616.0</b>	<b>608.5</b>	<b>4.5</b>
<b>Regional Demand</b>	<b>391.5</b>	<b>376.3</b>	<b>428.9</b>	<b>408.3</b>	<b>380.0</b>	<b>399.3</b>	<b>445.3</b>	<b>437.7</b>	<b>496.7</b>	<b>606.2</b>	<b>608.1</b>	<b>4.5</b>
Oil Sector	0.9	0.7	0.9	0.9	0.9	0.9	1.0	0.9	0.9	1.0	1.0	1.3
Industrial Sector	26.5	28.2	28.4	26.8	31.5	37.1	39.6	41.8	37.1	35.3	34.2	2.6
Electricity Sector *	362.4	345.7	398.3	379.7	346.5	360.1	403.2	393.5	457.0	568.0	571.3	4.7
Residential Sector	1.4	1.5	1.0	0.8	0.9	1.0	1.2	1.2	1.2	1.7	1.3	-0.3
Services Sector	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.3	1.5
Motor-Carrier Sector												
<b>Export</b>					<b>64.0</b>	<b>22.9</b>	<b>6.9</b>	<b>9.3</b>	<b>8.4</b>	<b>9.7</b>	<b>0.5</b>	<b>n.a.</b>
<b>To other regions</b>	<b>0.00</b>	-	-	-	-	-	-	-	-	-	-	<b>n.a.</b>
Inventories variations and differences	0.56	- 2.72	12.82	- 11.69	2.41	- 7.95	0.89	- 6.99	7.29	21.35	33.22	50.5

\* Includes continuous own uses

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

**TABLE A. 20. NATURAL GAS BALANCE NORTHEAST REGION, 2006-2016**  
(MMCFD)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006-2016
<b>Origin</b>	<b>1,984.9</b>	<b>2,091.7</b>	<b>2,221.1</b>	<b>2,309.7</b>	<b>2,427.0</b>	<b>2,614.8</b>	<b>2,782.8</b>	<b>2,911.6</b>	<b>3,052.5</b>	<b>3,491.7</b>	<b>3,828.4</b>	<b>6.8</b>
<b>Regional Production</b>	<b>1,358.5</b>	<b>1,361.4</b>	<b>1,326.7</b>	<b>1,448.6</b>	<b>1,414.6</b>	<b>1,279.6</b>	<b>1,201.2</b>	<b>1,205.3</b>	<b>1,144.1</b>	<b>957.5</b>	<b>747.1</b>	<b>-5.8</b>
<b>Import</b>	<b>626.4</b>	<b>730.0</b>	<b>894.4</b>	<b>861.1</b>	<b>1,012.5</b>	<b>1,335.2</b>	<b>1,581.6</b>	<b>1,706.3</b>	<b>1,908.4</b>	<b>2,534.2</b>	<b>3,081.3</b>	<b>17.3</b>
<b>From other regions</b>		0.2										n.a.
<b>Destination</b>	<b>1,975.6</b>	<b>2,098.0</b>	<b>2,210.6</b>	<b>2,300.4</b>	<b>2,424.3</b>	<b>2,616.0</b>	<b>2,784.1</b>	<b>2,913.5</b>	<b>3,051.3</b>	<b>3,439.3</b>	<b>3,830.2</b>	<b>6.8</b>
<b>Regional Demand</b>	<b>1,634.1</b>	<b>1,785.8</b>	<b>1,807.9</b>	<b>1,834.0</b>	<b>1,965.6</b>	<b>2,219.3</b>	<b>2,217.0</b>	<b>2,263.2</b>	<b>2,350.1</b>	<b>2,464.2</b>	<b>2,499.5</b>	<b>4.3</b>
Oil Sector	131.3	150.8	141.9	130.3	148.9	181.2	191.4	185.2	217.4	234.0	213.8	5.0
Industrial Sector	371.4	383.6	371.5	340.1	391.4	416.7	439.5	466.9	482.5	512.8	528.9	3.6
Electricity Sector *	1,057.5	1,174.7	1,219.1	1,294.3	1,353.8	1,554.4	1,515.0	1,537.5	1,577.7	1,635.5	1,676.4	4.7
Residential Sector	57.4	59.7	57.8	53.6	54.4	50.8	53.8	56.0	54.9	62.0	60.0	0.4
Services Sector	16.4	16.9	17.3	15.6	17.1	16.1	17.4	17.6	17.5	19.8	20.3	2.2
Motor-Carrier Sector	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	-8.8
<b>Export</b>	<b>32.7</b>	<b>138.7</b>	<b>107.4</b>	<b>66.5</b>	<b>19.3</b>	<b>1.3</b>	<b>0.9</b>	<b>3.1</b>	<b>4.1</b>	<b>2.8</b>	<b>2.2</b>	<b>-23.8</b>
<b>To other regions</b>	<b>308.8</b>	<b>173.5</b>	<b>295.4</b>	<b>399.9</b>	<b>439.5</b>	<b>395.4</b>	<b>566.1</b>	<b>647.2</b>	<b>697.0</b>	<b>972.4</b>	<b>1,328.5</b>	<b>15.7</b>
Inventories variations and differences	9.4	- 6.4	10.5	9.3	2.7	- 1.2	- 1.3	- 1.9	1.2	52.4	- 1.8	n.a.

\* Includes continuous own uses.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

**TABLE A. 21. NATURAL GAS BALANCE CENTRAL-WESTERN REGION, 2006-2016**  
(MMCFD)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006- 2016	
<b>Origin</b>	<b>564.8</b>	<b>637.3</b>	<b>705.0</b>	<b>666.2</b>	<b>703.4</b>	<b>730.1</b>	<b>803.5</b>	<b>897.4</b>	<b>1,057.2</b>	<b>1,123.2</b>	<b>1,255.0</b>	<b>8.3</b>	
Regional Production	-	-	-	-	-	-	-	-	-	-	-		
Import	-	-	-	-	-	-	95.2	370.3	440.3	376.5	445.0	n.a.	
<b>From other regions</b>	<b>564.8</b>	<b>637.3</b>	<b>705.0</b>	<b>666.2</b>	<b>703.4</b>	<b>730.1</b>	<b>708.3</b>	<b>527.1</b>	<b>616.9</b>	<b>746.7</b>	<b>809.9</b>	<b>3.7</b>	
<b>Destination</b>	<b>564.8</b>	<b>637.3</b>	<b>705.0</b>	<b>666.2</b>	<b>703.4</b>	<b>728.9</b>	<b>789.4</b>	<b>880.3</b>	<b>1,053.6</b>	<b>1,134.6</b>	<b>1,203.1</b>	<b>7.9</b>	
Regional Demand	564.8	637.3	705.0	666.2	703.4	728.9	789.4	880.3	1,053.6	1,134.6	1,203.1	7.9	
Industrial Sector	287.7	296.4	298.4	231.1	287.7	310.2	318.8	334.8	370.2	391.4	419.3	3.8	
Electricity Sector *	200.9	272.3	334.3	368.3	340.1	353.7	399.6	473.2	609.9	674.1	712.8	13.5	
Residential Sector	5.4	5.0	5.2	5.1	6.9	5.7	5.7	5.9	6.5	6.1	6.6	2.0	
Services Sector	2.2	2.1	2.1	2.7	3.4	2.0	2.2	2.8	3.8	5.4	7.3	12.6	
Motor-Carrier Sector								0.1	0.3	0.3	0.4	n.a.	
<b>Export</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
<b>To other regions</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
<b>Inventories variations and di</b>	<b>0.0</b>	<b>- 0.0</b>	<b>- 0.0</b>	<b>- 0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1.2</b>	<b>14.1</b>	<b>17.1</b>	<b>3.6</b>	<b>- 11.4</b>	<b>51.8</b>	<b>865.6</b>

\* Includes continuous own uses.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

**TABLE A. 22. NATURAL GAS BALANCE CENTRAL REGION, 2006-2016**  
(MMCFD)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006- 2016	
<b>Origin</b>	<b>642.7</b>	<b>639.1</b>	<b>655.8</b>	<b>672.9</b>	<b>712.1</b>	<b>752.4</b>	<b>754.1</b>	<b>818.0</b>	<b>767.1</b>	<b>919.4</b>	<b>885.1</b>	<b>3.3</b>	
Regional Production	-	-	-	-	-	-	-	-	-	-	-		
Import	-	-	-	-	-	-	-	-	-	-	-		
<b>From other regions</b>	<b>642.7</b>	<b>639.1</b>	<b>655.8</b>	<b>672.9</b>	<b>712.1</b>	<b>752.4</b>	<b>754.1</b>	<b>818.0</b>	<b>767.1</b>	<b>919.4</b>	<b>885.1</b>	<b>3.3</b>	
<b>Destination</b>	<b>642.7</b>	<b>639.1</b>	<b>655.8</b>	<b>672.9</b>	<b>712.1</b>	<b>752.4</b>	<b>754.1</b>	<b>818.0</b>	<b>767.1</b>	<b>919.4</b>	<b>885.1</b>	<b>3.3</b>	
Regional Demand	642.7	639.1	655.8	672.9	712.1	752.4	754.1	818.0	767.1	919.4	885.1	3.3	
Oil Sector	72.9	63.0	92.6	94.0	87.8	103.8	103.1	104.3	108.8	114.8	84.7	1.5	
Industrial Sector	246.4	251.5	244.7	234.6	257.2	274.7	286.7	292.4	300.3	322.1	330.5	3.0	
Electricity Sector *	297.0	295.7	288.1	313.6	336.5	341.4	332.2	388.2	323.1	448.2	432.3	3.8	
Residential Sector	20.3	22.3	23.3	23.4	23.5	24.2	23.4	23.6	25.2	24.9	26.9	2.8	
Services Sector	4.2	4.8	5.6	5.9	5.8	6.8	7.0	7.4	7.6	7.5	8.3	7.1	
Motor-Carrier Sector	1.9	1.8	1.5	1.4	1.3	1.4	1.8	2.2	1.9	2.0	2.4	2.3	
<b>Export</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
<b>To other regions</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
<b>Inventories variations and differences</b>	<b>0.0</b>	<b>- 0.0</b>	<b>- 0.0</b>	<b>- 0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>- 0.0</b>	<b>- 0.0</b>	<b>0.0</b>	<b>- 0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>285.5</b>

\* Includes continuous own uses.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.





TABLE A. 23. NATURAL GAS BALANCE SOUTH-SOUTHEAST REGION, 2006-2016  
(MMCFD)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	AAGR 2006-2016	
<b>Origin</b>	<b>3,326.4</b>	<b>3,605.6</b>	<b>3,593.3</b>	<b>3,522.4</b>	<b>3,589.4</b>	<b>3,533.1</b>	<b>3,401.8</b>	<b>3,287.1</b>	<b>3,248.8</b>	<b>3,109.3</b>	<b>2,821.0</b>	<b>-1.6</b>	
Regional Production	3,326.4	3,605.6	3,593.3	3,522.4	3,589.4	3,533.1	3,401.8	3,287.1	3,248.8	3,109.3	2,821.0	-1.6	
Import	-	-	-	-	-	-	-	-	-	-	-	-	
<b>From other regions</b>													
<b>Destination</b>	<b>3,338.6</b>	<b>3,590.4</b>	<b>3,577.8</b>	<b>3,461.8</b>	<b>3,555.8</b>	<b>3,499.5</b>	<b>3,368.9</b>	<b>3,251.1</b>	<b>3,228.8</b>	<b>3,073.4</b>	<b>2,789.3</b>	<b>-1.8</b>	
Regional Demand	2,439.9	2,487.3	2,512.3	2,522.7	2,579.8	2,412.4	2,472.6	2,553.1	2,541.9	2,379.7	2,422.8	-0.1	
Oil Sector	1,886.0	1,849.3	1,874.6	1,865.2	1,933.7	1,843.0	1,914.6	1,918.4	1,885.5	1,793.0	1,765.6	-0.7	
Industrial Sector	82.1	80.4	83.5	80.3	86.5	90.5	96.5	104.0	123.3	114.7	171.3	7.6	
Electricity Sector *	471.7	557.4	554.1	577.0	559.4	478.7	461.4	530.2	532.6	471.8	485.7	0.3	
Residential Sector													
Services Sector	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5	0.3	0.2	1.4	
Motor-Carrier Sector													
<b>Export</b>													
<b>To other regions</b>	<b>898.8</b>	<b>1,103.1</b>	<b>1,065.5</b>	<b>939.2</b>	<b>976.0</b>	<b>1,087.0</b>	<b>896.3</b>	<b>698.0</b>	<b>686.9</b>	<b>693.7</b>	<b>366.5</b>	<b>-8.6</b>	
<b>Inventories variations and differences</b>	<b>-</b>	<b>12.2</b>	<b>15.1</b>	<b>15.5</b>	<b>60.6</b>	<b>33.6</b>	<b>33.7</b>	<b>32.9</b>	<b>36.1</b>	<b>20.0</b>	<b>35.9</b>	<b>31.7</b>	<b>n.a.</b>

\* Includes continuous own uses.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

TABLE A. 24. NATURAL GAS BALANCE, 2016-2031  
(MMCFD)

Concept	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
<b>Origin</b>	<b>7,736.2</b>	<b>8,018.3</b>	<b>8,323.4</b>	<b>9,011.5</b>	<b>9,274.2</b>	<b>9,304.0</b>	<b>9,385.8</b>	<b>9,266.6</b>	<b>9,392.8</b>	<b>9,507.5</b>	<b>9,672.9</b>	<b>9,673.9</b>	<b>9,866.0</b>	<b>9,826.7</b>	<b>9,754.2</b>	<b>9,658.8</b>	<b>1.5</b>
National Production	3,569.1	3,170.3	3,014.7	3,310.2	3,195.8	3,546.3	3,426.1	3,522.3	3,715.0	4,015.4	4,010.7	4,145.3	4,387.4	4,481.0	4,950.3	5,046.3	2.3
Import	4,168.1	4,848.0	5,308.8	5,701.3	6,078.4	5,757.7	5,959.7	5,744.3	5,677.9	5,492.1	5,662.1	5,528.6	5,478.6	5,345.7	4,804.0	4,612.5	0.7
<b>Destination</b>	<b>7,621.3</b>	<b>8,018.8</b>	<b>8,324.0</b>	<b>9,012.1</b>	<b>9,274.9</b>	<b>9,304.7</b>	<b>9,386.5</b>	<b>9,267.3</b>	<b>9,393.6</b>	<b>9,508.4</b>	<b>9,673.7</b>	<b>9,674.8</b>	<b>9,867.0</b>	<b>9,827.7</b>	<b>9,755.3</b>	<b>9,659.9</b>	<b>1.6</b>
Domestic Demand	7,618.7	8,017.0	8,322.2	9,011.5	9,273.8	9,303.2	9,384.8	9,265.7	9,392.5	9,508.0	9,673.6	9,674.8	9,867.0	9,827.7	9,755.3	9,659.9	1.6
Oil Sector	2,034.8	2,006.4	2,006.4	2,290.9	2,309.1	2,273.4	2,305.1	2,210.4	2,176.3	2,124.8	2,044.4	1,947.8	1,868.9	1,778.4	1,680.5	1,546.7	-1.8
Industrial Sector	1,484.1	1,496.8	1,593.0	1,749.1	1,832.6	1,853.1	1,873.1	1,890.5	1,907.3	1,919.4	1,930.9	1,941.7	1,949.2	1,954.3	1,958.3	1,964.1	1.9
Electricity Sector	3,965.7	4,376.7	4,580.0	4,822.7	4,977.7	5,016.6	5,041.3	4,994.6	5,133.9	5,284.4	5,514.6	5,597.4	5,857.2	5,899.4	5,917.2	5,947.2	2.7
Residential Sector	94.8	96.6	100.6	104.8	108.5	111.9	115.0	117.7	120.3	122.6	124.8	126.8	128.7	130.4	132.0	132.8	2.3
Services Sector	36.4	37.5	38.8	40.4	41.9	43.8	45.6	47.4	49.3	51.2	53.2	55.2	57.2	59.2	61.2	63.3	3.8
Motor-Carrier Sector	2.8	3.2	3.4	3.7	4.1	4.4	4.8	5.1	5.4	5.6	5.7	5.8	5.9	6.0	6.0	5.9	5.0
Export	2.6	1.8	1.8	0.5	1.1	1.5	1.7	1.6	1.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	n.a.
<b>Inventories variations and differences</b>	<b>114.9</b>	<b>-0.5</b>	<b>-0.5</b>	<b>-0.6</b>	<b>-0.6</b>	<b>-0.7</b>	<b>-0.7</b>	<b>-0.7</b>	<b>-0.8</b>	<b>-0.8</b>	<b>-0.9</b>	<b>-0.9</b>	<b>-1.0</b>	<b>-1.0</b>	<b>-1.1</b>	<b>-1.1</b>	<b>n.a.</b>

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

TABLE A. 25. NATURAL GAS BALANCE NORTHEAST REGION, 2016-2031  
(MMCFD)

Concept	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
<b>Origin</b>	<b>3,828.4</b>	<b>4,582.5</b>	<b>5,048.7</b>	<b>5,257.0</b>	<b>5,555.5</b>	<b>5,274.3</b>	<b>5,398.7</b>	<b>5,225.6</b>	<b>5,124.2</b>	<b>5,010.2</b>	<b>5,242.5</b>	<b>5,080.0</b>	<b>5,080.8</b>	<b>4,758.4</b>	<b>4,202.4</b>	<b>3,992.3</b>	<b>0.3</b>
Regional Production	747.1	373.6	407.6	513.7	541.6	605.2	559.3	579.3	613.3	705.2	763.4	746.4	834.0	738.4	730.8	694.6	-0.5
Import	3,081.3	4,208.9	4,641.1	4,743.3	5,013.9	4,669.0	4,839.4	4,646.3	4,511.0	4,305.0	4,479.1	4,333.6	4,246.8	4,020.0	3,471.6	3,297.7	0.5
<b>From other regions</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>n.a.</b>
<b>Destination</b>	<b>3,830.2</b>	<b>4,582.5</b>	<b>5,048.7</b>	<b>5,257.0</b>	<b>5,555.5</b>	<b>5,274.3</b>	<b>5,398.7</b>	<b>5,225.6</b>	<b>5,124.2</b>	<b>5,010.2</b>	<b>5,242.5</b>	<b>5,080.0</b>	<b>5,080.8</b>	<b>4,758.4</b>	<b>4,202.4</b>	<b>3,992.3</b>	<b>0.3</b>
Regional Demand	2,499.5	2,580.1	2,819.6	2,909.6	2,965.7	2,905.9	2,927.3	2,895.6	2,880.6	2,877.4	3,002.1	3,038.2	3,219.4	3,163.6	3,170.8	3,170.8	1.6
Oil Sector	213.8	209.8	209.8	241.6	242.4	208.7	211.2	206.6	204.3	201.4	196.9	191.7	187.6	182.8	177.7	171.0	-1.5
Industrial Sector	528.9	534.7	572.5	608.9	616.6	623.3	629.8	635.5	640.9	644.8	648.5	652.0	654.5	656.2	657.5	659.4	1.5
Electricity Sector	1,676.4	1,755.4	1,954.6	1,974.8	2,020.6	1,985.9	1,996.4	1,961.8	1,942.0	1,935.9	2,059.5	2,095.7	2,276.8	2,222.3	2,231.5	2,235.2	1.9
Residential Sector	60.0	57.7	59.2	60.3	61.5	62.7	63.8	64.8	65.8	66.7	67.6	68.4	69.2	69.9	70.6	70.6	1.1
Services Sector	20.3	22.3	23.3	23.8	24.4	25.1	25.8	26.6	27.4	28.2	29.1	30.1	31.0	32.0	33.1	34.2	3.5
Motor-Carrier Sector	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	14.0
Export	2.2	1.8	1.8	0.5	1.1	1.5	1.7	1.6	1.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	n.a.
<b>To other regions</b>	<b>1,328.5</b>	<b>2,000.5</b>	<b>2,227.3</b>	<b>2,346.9</b>	<b>2,588.8</b>	<b>2,366.9</b>	<b>2,469.7</b>	<b>2,328.4</b>	<b>2,242.4</b>	<b>2,132.4</b>	<b>2,240.3</b>	<b>2,041.7</b>	<b>1,861.4</b>	<b>1,594.7</b>	<b>1,031.6</b>	<b>821.4</b>	<b>-3.2</b>
<b>Inventories variations and differences</b>	<b>-1.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>n.a.</b>

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

TABLE A. 26. NATURAL GAS BALANCE NORTHWEST REGION, 2016-2031  
(MMCFD)

Concept	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
Origin	641.7	639.2	667.7	958.0	1,064.5	1,088.7	1,120.4	1,098.0	1,166.9	1,187.1	1,183.0	1,195.0	1,231.8	1,325.7	1,332.4	1,314.8	4.9
Regional Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Import	641.7	639.2	667.7	958.0	1,064.5	1,088.7	1,120.4	1,098.0	1,166.9	1,187.1	1,183.0	1,195.0	1,231.8	1,325.7	1,332.4	1,314.8	4.9
From other regions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Destination	608.5	639.7	668.3	958.6	1,065.1	1,089.3	1,121.1	1,098.7	1,167.7	1,187.9	1,183.9	1,195.9	1,232.8	1,326.7	1,333.4	1,315.9	5.3
Regional Demand	608.1	639.7	668.3	958.6	1,065.1	1,089.3	1,121.1	1,098.7	1,167.7	1,187.9	1,183.9	1,195.9	1,232.8	1,326.7	1,333.4	1,315.9	5.3
Oil Sector	1.0	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	2.5
Industrial Sector	34.2	35.0	35.7	95.9	156.1	157.8	159.4	161.0	162.5	163.5	164.4	165.3	165.8	166.1	166.3	166.6	11.1
Electricity Sector	571.3	600.7	628.5	858.5	904.8	927.2	957.1	933.1	1,000.4	1,019.5	1,014.4	1,025.5	1,061.7	1,155.2	1,161.6	1,143.7	4.7
Residential Sector	1.3	2.1	2.2	2.2	2.3	2.3	2.4	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Services Sector	0.3	0.5	0.5	0.6	0.6	0.6	0.7	0.7	-0.8	-0.8	-0.9	-0.9	-1.0	-1.0	-1.1	-1.1	n.a.
Motor-Carrier Sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Export	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
To other regions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Inventories variations and differences	33.2	-0.5	-0.5	-0.6	-0.6	-0.7	-0.7	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

TABLE A. 27. NATURAL GAS BALANCE CENTRAL-WESTERN REGION, 2016-2031  
(MMCFD)

Concept	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
Origin	1,255.0	1,068.4	1,093.7	1,162.4	1,235.0	1,275.0	1,252.7	1,257.9	1,259.7	1,356.6	1,488.8	1,493.4	1,487.0	1,490.1	1,492.8	1,478.3	1.1
Regional Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Import	445.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
From other regions	809.9	1,068.4	1,093.7	1,162.4	1,235.0	1,275.0	1,252.7	1,257.9	1,259.7	1,356.6	1,488.8	1,493.4	1,487.0	1,490.1	1,492.8	1,478.3	4.1
Destination	1,203.1	1,068.4	1,093.7	1,162.4	1,235.0	1,275.0	1,252.7	1,257.9	1,259.7	1,356.6	1,488.8	1,493.4	1,487.0	1,490.1	1,492.8	1,478.3	1.4
Regional Demand	1,203.1	1,068.4	1,093.7	1,162.4	1,235.0	1,275.0	1,252.7	1,257.9	1,259.7	1,356.6	1,488.8	1,493.4	1,487.0	1,490.1	1,492.8	1,478.3	1.4
Oil Sector	56.8	37.7	37.7	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4	1.4
Industrial Sector	419.3	421.6	453.9	484.6	490.4	495.6	500.5	504.7	508.7	511.6	514.3	516.9	518.6	519.8	520.8	522.2	1.5
Electricity Sector	712.8	597.5	590.3	594.8	660.4	694.1	665.9	666.1	663.1	756.4	885.3	886.9	878.2	879.6	881.1	864.8	1.3
Residential Sector	6.6	6.8	7.2	7.6	8.2	8.7	9.1	9.4	9.7	9.9	10.1	10.3	10.4	10.5	10.6	10.7	3.3
Services Sector	7.3	4.3	4.0	4.5	5.0	5.5	5.9	6.4	6.8	7.2	7.6	7.9	8.2	8.5	8.8	9.1	1.4
Motor-Carrier Sector	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	7.2
Export	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
To other regions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Inventories variations and differences	51.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

TABLE A. 28. NATURAL GAS BALANCE CENTRAL REGION, 2016-2031  
(MMCFD)

Concept	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
Origin	885.1	916.2	946.8	1,031.6	984.7	966.6	984.1	917.7	836.7	837.0	837.8	839.6	870.1	870.0	881.9	882.6	0.0
Regional Production	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Import	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
From other regions	885.1	916.2	946.8	1,031.6	984.7	966.6	984.1	917.7	836.7	837.0	837.8	839.6	870.1	870.0	881.9	882.6	0.0
Destination	885.1	916.2	946.8	1,031.6	984.7	966.6	984.1	917.7	836.7	837.0	837.8	839.6	870.1	870.0	881.9	882.6	0.0
Regional Demand	885.1	916.2	946.8	1,031.6	984.7	966.6	984.1	917.7	836.7	837.0	837.8	839.6	870.1	870.0	881.9	882.6	0.0
Oil Sector	84.7	75.8	75.8	133.9	96.6	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	-2.4
Industrial Sector	330.5	337.9	359.0	381.9	387.4	392.3	397.0	401.1	405.1	407.9	410.6	413.1	414.8	415.9	416.8	418.1	1.6
Electricity Sector	432.3	461.7	468.3	469.4	451.7	463.4	473.8	401.3	314.4	310.1	306.4	304.0	331.4	328.8	338.4	336.7	-1.7
Residential Sector	26.9	28.6	30.7	32.6	34.4	36.1	37.5	38.8	40.0	41.1	42.1	43.1	44.0	44.8	45.5	46.1	3.7
Services Sector	8.3	9.6	10.2	10.9	11.5	12.1	12.6	13.2	13.8	14.4	15.0	15.7	16.3	16.9	17.5	18.1	5.3
Motor-Carrier Sector	2.4	2.5	2.7	2.9	3.2	3.5	3.8	4.0	4.1	4.2	4.3	4.4	4.4	4.4	4.4	4.3	4.1
Export	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
To other regions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Inventories variations and differences	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

**TABLE A. 29. NATURAL GAS BALANCE SOUTH-SOUTHEAST REGION, 2016-2031**  
(MMCFD)

Concept	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	AAGR 2016-2031
Origin	2,821.0	2,812.6	2,793.9	2,949.4	3,023.2	3,066.4	3,099.8	3,095.8	3,247.8	3,310.3	3,247.4	3,398.9	3,553.4	3,742.6	4,219.5	4,351.7	2.9
<b>Regional Production</b>	2,821.0	2,796.7	2,607.1	2,796.5	2,654.2	2,941.1	2,866.8	2,943.0	3,101.7	3,310.3	3,247.4	3,398.9	3,553.4	3,742.6	4,219.5	4,351.7	2.9
Import	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
<b>From other regions</b>	0.0	16.0	186.8	152.9	369.0	125.3	233.0	152.8	146.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Destination	2,789.3	2,812.6	2,793.9	2,949.4	3,023.2	3,066.4	3,099.8	3,095.8	3,247.8	3,310.3	3,247.4	3,398.9	3,553.4	3,742.6	4,219.5	4,351.7	3.0
<b>Regional Demand</b>	2,422.8	2,812.6	2,793.9	2,949.4	3,023.2	3,066.4	3,099.8	3,095.8	3,247.8	3,249.1	3,161.1	3,107.6	3,057.7	2,977.3	2,876.4	2,812.3	1.0
Oil Sector	1,678.4	1,681.7	1,681.7	1,843.6	1,898.3	1,933.5	1,962.8	1,872.7	1,840.9	1,792.3	1,716.4	1,625.0	1,550.2	1,464.5	1,371.8	1,244.6	-2.0
Industrial Sector	171.3	167.5	171.9	177.9	182.0	184.2	186.3	188.2	190.2	191.6	193.0	194.4	195.5	196.3	197.0	197.9	1.0
Electricity Sector	572.8	961.4	938.2	925.3	940.3	946.1	948.1	1,032.2	1,214.0	1,262.5	1,248.8	1,285.3	1,309.1	1,313.6	1,304.7	1,366.9	6.0
Residential Sector	0.0	1.4	1.4	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	n.a.
Services Sector	0.2	0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	8.6
Motor-Carrier Sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
Export	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.
<b>To other regions</b>	366.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.1	86.3	291.3	495.7	765.3	1,343.1	1,539.4	10.0
Inventories variations and differences	31.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	n.a.

Source: Elaborated by IMP, based on information from BANXICO, CFE, CNIAA, CONAGUA, CONAPO, CONUEE, CRE, EIA, EPA, IEA, INEGI, Pemex, SENER and private companies.

## GLOSSARY

<b>Acid gas</b>	Compound occasionally present in the NG, like sulfuric acid and carbon dioxide, and which give NG acid peculiarities due to their physical and chemical properties.
<b>Associated gas</b>	NG in direct contact and/or dissolved in the crude oil of the reservoir. This can be classified as tapped gas (free) or solution gas (dissolved).
<b>Benchmark price</b>	Price taken within the relevant markets for trading hydrocarbons produced or purchased by PEMEX. Such benchmark price is the most representative one for simulating competitive conditions in an open market.
<b>Butane</b>	Hydrocarbons that belong to the alkane family formed by four atoms of carbon, and ten of hydrogen and which are produced by fractionating NG liquids, condensates, and some refining processes, like crude-oil atmospheric distillation, catalytic disintegration, and naphthas reforming. Mixed with propane, it produces liquefied petroleum gas.
<b>Cogeneration</b>	Technology used to sequentially produce two types of energy useful to industrial processes. Normally thermal energy and electric power.
<b>Combined cycle</b>	Technology which uses NG as a fuel to generate electricity. It is formed by two parts; in the first one, the NG combustion gases go through a gas turbine for producing electricity. In the second one, the thermal energy from the exhaust gas is used, through an interchanger, for producing steam and feed a steam turbine in order to generate even more electricity.
<b>Compressed natural gas</b>	Dry natural gas stored at a pressure of 200-250 atmospheres in gaseous state in a container.
<b>Compression station</b>	Station located each 60 km or 80 km along a gas pipeline and whose operation consists on compressing gas in order to keep its pressure and flowing as specified.
<b>Cryogenic plant</b>	Plant which, through a low-temperatures process separates and eliminates any gas component that could affect the transport and distribution systems, such as carbon dioxide, water steam, and heavy hydrocarbons.



<b>Cryogenic process</b>	Industrial process which uses the intrinsic energy contained in NG to, by means of a sudden change of pressure, generate a temperature reduction and thus achieving a 100% recovery of hydrocarbons contained in the NG from the propane.
<b>Distribution</b>	Activity of receiving, conveying, delivering, and if the case, commercialize NG through pipelines within a geographical zone.
<b>Dry gas</b>	NG containing less amounts of hydrocarbons heavier than methane. It is also obtained from processing plants.
<b>End user</b>	Person who purchases gas for his/her consumption.
<b>First-hand sales</b>	They are defined as the first sale of natural gas, produced in Mexico and sold by Petroleos Mexicanos to a third party for delivery in the national territory, the First-Hand Sale (FHS) is an activity regulated by the Energy Regulatory Commission (CRE).
<b>Fuel</b>	Substance used to produce thermal energy through a chemical or nuclear reaction. The energy is produced by the conversion of the fuel mass into heat.
<b>Fueling L.P. Gas</b>	Name given to the LP Gas used in vehicles with internal combustion engines.
<b>Gas liquefaction</b>	Process of cooling NG at $-162\text{ }^{\circ}\text{C}$ which reduces its volumes by a factor of 600, becoming a liquid. The resulting liquefied natural gas is thus transportable in tankers designed for that purpose, or it can be stored in containers.
<b>Gas pipeline</b>	System or group of facilities which is used for transporting the NG coming from production centers of from processing and utilization plants, to large-volumes consumers.
<b>Gas Processing Center</b>	PGPB facility in which the sweetening process of the sour gas is carried out; the resultant sweet gas is processed for extracting, through cryogenic and fracking processes, liquid hydrocarbons contained in the NG, obtaining -among others- the products which form the L.P. gas.
<b>Gasification</b>	Producing of gaseous fuel from a solid or liquid fuel.

<b>Henry Hub</b>	Confluence point of gas pipelines located in Louisiana, USA. This is used as a reference for establishing future NG contracts to be negotiated in the NYMEX (New York Mercantile Exchange).
<b>Liquefied natural gas</b>	NG mainly composed by methane (CH <sub>4</sub> ) which is liquefied to facilitate its transportation; it is liquefied through cooling at approximately less than 161 °C at atmospheric pressure.
<b>Liquid or gas fossil fuels</b>	Derivatives of crude oil or NT such as limpid petroleum (kerosene), gasolines, diesel, fuel oil, gasoil, LP gas, butane, methane, isobutane, propylene, butylene, or any of their combinations.
<b>Liquids fractionation</b>	Process through which condensates and gas liquids are separated by distillation to obtain mainly LP gas and gasoline.
<b>Logistics imports</b>	Imports carried out in border points to supply the demand which cannot access domestic production due to a lack of infrastructure or transportation costs.
<b>Methane</b>	Gas that, when found in pure state is colorless, odorless, and tasteless, and lighter than air. Its condensation temperature at normal pressure (1 atmosphere) is -161.5 °C, in a mixture of 5 to 15 percent in volume with air it forms an explosive mixture. It is the first member of the series of saturated hydrocarbons (also known as paraffins or alkanes); its condensed formula is CH <sub>4</sub> . It is also known as 'marsh gas' since it is generated there as the anaerobic decomposition produce of organic matter. It is the main component of NG, accounting for more than 90% in volume. It is also obtained from the distillation of bituminous coal.
<b>Mexican Official Standards</b>	Mandatory norms issued by the competent entities subjected to what is ordered in the Federal Law on Metrology and Normalization.
<b>Natural gas (NG)</b>	Gaseous blend which is extracted associated with oil or from sole-gas reservoirs. Its main components, in descending value of amount are methane, ethane, propane, butanes, pentanes, and hexanes. When it is extracted from wells, it generally contains impurities such as sulfuric acid, mercaptans, carbon dioxide, and water steam. Impurities are eliminated in gas processing plants using solvents or absorbents. The term is also used to name the processed gas which is supplied to the industry and to commercial or individual users and which has a specified quality.
<b>Natural Gas quality</b>	Composition and group of physical-chemical features of the NG according to the following characteristics: heat of combustion, Wobbe index, density, compressibility factor, and dew points.



<b>Non-associated gas</b>	NG found in reservoirs not containing crude oil at original pressure and temperature conditions.
<b>Permittee</b>	Owner of a permit for transportation, storage, and distribution.
<b>Pipelines</b>	Piping and facilities for conveying NG or liquefied gas.
<b>Pipelines or LPG pipelines</b>	Piping systems used for transporting LP gas according to the Mexican Official Standards.
<b>Play</b>	Group of fields and/or prospects within a defined region, which are controlled by the same general geological features.
<b>Propane</b>	Hydrocarbon found in small amounts within NG. It is obtained by fractionating NG liquids, from condensates, and from diverse refining processes such as crude-oil atmospheric distillation, catalytic disintegration, and naphthas reforming. It is relatively easy to liquefy if compressed, and thereby is used on its own or blended with butane to form LP gas.
<b>Sour gas</b>	NG containing sulfur derivatives such as sulfuric acid, mercaptans, sulfurs, and disulfurs. Comes directly from crude oil reservoirs or from the various refining processes.
<b>Sweet gas</b>	NG free of sulfuric acid, mercaptans, and other sulfur derivatives. There are sweet gas reservoirs, but it is mostly obtained through sweetening sour natural gas using chemical solvents, physical solvents, or absorbents.
<b>Sweetener plant</b>	Plant in which the acid gases of the sour gas or the condensates are separated. That is, sulfur and carbon dioxide compounds are eliminated.
<b>Sweetening</b>	Process which removes pollutants such as sulfuric acid and carbon dioxide from the sour wet gas received from the producing wells. The process consists of scrubbing sour gas with an aqueous solution of diethanolamine (DEA) or monoethanolamide (MEA); DEA is the most commonly used given its low corrosion range. These substances absorb impurities, so in the next stage of the process, the DEA or MEA is regenerated through a steam treatment and is recycled, delivering the CO <sub>2</sub> and the sulfur absorbed like sulfuric acid.
<b>Tank car</b>	Container designed to work under pressure or at atmospheric conditions, assembled on a platform or directly on wheels to be transported on railways.

**Tanker truck**

Vehicle in which chassis is permanently installed a container for LPG with a 25,000 l-maximum capacity and is used to exclusively supply fuel to non-transportable containers within utilization facilities and LPG stations for fuel through a filling system. They are known as "pipes".

**Trade-deficit imports**

Imports for covering the deficit between demand and supply in PGPB's National Gas Pipelines System.

**Transportation**

Reception, conveyance, and delivery of NG by means of pipelines to people who are no end users.

**User**

Person who uses or asks for the services of a permit-holder.

**Wet gas**

Hydrocarbons blend obtained from processing NG from which impurities or non-hydrocarbons compounds have been eliminated, and whose content of components heavier than methane is such that allow its commercial processing.





## ACRONYMS AND ABBREVIATIONS

AAGR	Annual Average Growth Rate
BTU	British Thermal Unit
CENAGAS	National Center for Natural Gas Control
CFE	Federal Electricity Commission
CNG	Compressed natural gas
CNH	National Hydrocarbons Commission
CONAGUA	National Water Commission
CONAPO	National Population Council
CPG	Gas Processing Center
CRE	Energy Regulatory Commission
DOF	Official Journal of the Federation
EIA	Energy Information Administration (U.S)
EIP	Energy Independent Producer
EPE	State Productive Enterprise
EPS	Subsidiary Productive Enterprise
FHS	First-Hand Sales
GCal	Gigacalorie
GDP	Gross Domestic Product
Ibidem	Same as the previous
IEA	International Energy Agency
IMP	Mexican Petroleum Institute
INEGI	National Institute of Statistics and Geography
LNG	Liquefied natural gas
LP Gas	Liquefied Petroleum Gas
MBD	Thousand barrels per day

MBDGE	Thousand barrels per day of gasoline equivalent
MBDLPGE	Thousand barrels per day of LP gas equivalent
MCFD	Thousand cubic feet per day
MMCFD	Million cubic feet per day
MMCFDNGE	Million cubic feet per day of natural gas equivalent
MMT	Million tons
MT	Thousand tons
N. A	Not applicable
NG	Natural gas
PEMEX	Petroleos Mexicanos
PEP	PEMEX Exploration and Production
PGPB	PEMEX Gas and Basic Petrochemistry
PPQ	PEMEX Petrochemistry
PR	PEMEX Refining
SENER	Secretariat of Energy
SISTRANGAS	National Comprehensive System for Transportation and Storage of Natural Gas
SNG	National Gas-Pipelines System
SNR	National Refining System
US\$	American dollars



## WEBSITES CONSULTED

- <https://www.gob.mx/sener/articulos/Round-cero-y-migracion-de-contratos-de-pemex>.
- <sup>1</sup><https://www.gob.mx/sener/acciones-y-programas/plan-quinquenal-de-licitaciones-para-la-exploracion-y-extraccion-de-hidrocarburos-2015-2019-98261>
- <https://www.gob.mx/cenagas/acciones-y-programas/proceso-de-contratacion-de-servicios-especializados-76054>
- <sup>1</sup>[https://www.gob.mx/cms/uploads/attachment/file/274410/531\\_DGGNP\\_003\\_17\\_TVA\\_4\\_P\\_P\\_29\\_Prontuario\\_de\\_gas\\_natural\\_Reporte\\_noviembre\\_2017.pdf](https://www.gob.mx/cms/uploads/attachment/file/274410/531_DGGNP_003_17_TVA_4_P_P_29_Prontuario_de_gas_natural_Reporte_noviembre_2017.pdf)
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- <https://www.gob.mx/cre/documentos/indice-de-referencia-nacional-de-precios-de-gas-natural-al-mayoreo-ipgn?idiom=es>

## **Explanatory Notes:**

- The total up of the numerical or percentage data within the text, tables, charts, or figures may not add up due to rounding.
- The information corresponding to the last historical year is subjected to subsequent reviews.
- Likewise, regarding the sum of the figures, the manual estimation of the average annual growth rates may not coincide accurately with the values reported due to rounding.
- In the modality of Independent Power Producer (IPP), the figures reported under the concept of “authorized capacity” and “operating capacity” do not necessarily coincide with the figures reported under the concept of “gross capacity hired by the CFE”.

## **References for comments**

For those interested in provide their observations, suggestions, or make any questions, please contact:

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