

**NATURAL GAS
MARKET OUTLOOK
2007-2016**



**SECRETARÍA
DE ENERGÍA**

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GEORGINA KESSEL MARTÍNEZ

Ministry of Energy

JORDY HERRERA FLORES

Undersecretary of Energy Planning and Technological Development

MARIO GABRIEL BUDEBO

Undersecretary of Hydrocarbons

BENJAMÍN CONTRERAS ASTIAZARÁN

Undersecretary of Electricity

MARÍA DE LA LUZ RUIZ MARISCAL

General Administrator

VERÓNICA IRASTORZA TREJO

General Director of Energy Planning

HÉCTOR ESCALANTE LONA

Press Unit General Director

PARTICIPANTS:

VERÓNICA IRASTORZA TREJO

Energy Planning General Director

VIRGINIA DONIZ GONZÁLEZ

National Energy Politics Integrating Director

JUAN IGNACIO NAVARRETE BARBOSA

Fuels Politics Deputy-Director

EDITION:

MARÍA INÉS DE VALLE CASTILLA

Dissemination Director

ROSA MARÍA NORIEGA MORALES

Graphic Desing Head of Department

PRESENTATION

The energy sector is a fundamental part of this Administration's economic politics aimed at creating better conditions for economic growth and increasing the living standards of all Mexicans. This has been captured in the National Development Plan 2007-2012, establishing that the energy sector shall contribute to the sustainable development of the national economy.

In the last few years, the strengthening of the natural gas market in Mexico has responded to the impulse of policies centered on fostering the use of cleaner and more efficient fuels, by virtue of the awareness to protect the environment. Faced with the growing hydrocarbon demand of the last decade, this industry's challenge is evident: guarantee reliable supply, quality and competitive prices demanded by consumers. This implies the strengthening of crude oil and natural gas exploration and production, the increase of storage capacities and making the current National Gas Pipeline System redundant.

To achieve these objectives, the development of reserves must be promoted and the necessary investments made to fully benefit from gas extraction and processing. Greater flexibility in the management of public companies shall also be encouraged, accompanied by a higher degree of transparency and accountability. At the same time, it is necessary to drive the participation of private capital in the allowed areas, within the existing legal framework. This is how we will be able to guarantee necessary investments in gas exploration and production as well as in infrastructure development.

Important results were achieved in 2006, toward guarantee natural gas supply, registering historical maximum production volumes. On the other hand, the diversification of gas importing sources to complement Pemex's efforts has become an option with the beginning of operation of the Altamira regasification terminal. At the same time, progress has been made on two more terminal projects on the Pacific coast, in order to continue guaranteeing the supply of this fuel through liquefied natural gas (LNG).

Given the need for strategic planning tools for the sector, in particular in the natural gas industry, the Ministry of Energy publishes this Outlook for the natural gas market for 2007-2016, as part of a widespread process aimed at the coordination and planning of different entities of the Mexican energy sector.

This Outlook includes the best information available on the natural gas market, and integrates the evolution process of the last decade as well as growth expectations until 2016. The latter also includes a strategic vision about the expansion of this industry in our country.

The objective of this document is to become an analytical tool for experts and those interested in this sector, based on an objective analysis of our current situation to accurately define challenges and to be able to assert alternative solutions, and hence to construct a reliable energy sector, thereby respecting the environment, driving economic growth and increasing the wellbeing of the society.

Georgina Kessel Martínez

Minister of Energy

EVOLUTION OF THE DOMESTIC SUPPLY AND DEMAND OF NATURAL GAS 2007-2016

This chapter contains the prospective analysis of natural gas demand, both by sectors and regions, on a scenario defined as base scenario, which among its assumptions, sets an average annual GDP growth of 3.6% during the 2007-2016 period. Supply, in turn, is a result of an estimate based on a series of projects that acknowledge PEP's execution capacity, and with it the necessary investments to be made by PGPB (Pemex Gas y Petroquímica Básica) to produce and transport domestic supply that will increase by 3.3% in the period of analysis¹.

The domestic balance of natural gas for 2006-2016 considers the programmed participation of the LNG terminals of Altamira, Ensenada and Manzanillo that will support the increase of supply and the diversification in imports, thus generating an increase in PGPB's exports.

1.1 Analysis of the prospective demand of natural gas

The main input for the projections of natural gas demand on the domestic market for the next 10 years is the macroeconomic scenario. It takes into account the General Economic Politics Criteria for 2007, issued by the Mexican Ministry of Finance and Public Credit, the price scenario of substitute fuels authorized by the Ministry of Energy, other aspects related to the tendencies in each end-use sector, private and public infrastructure projects.

The estimated annual economic growth rate for 2007-2016 is on average 3.6%, slightly lower than the forecast used in the previous outlook, which projected a rate of 3.8% for the 2006- 2015 period.

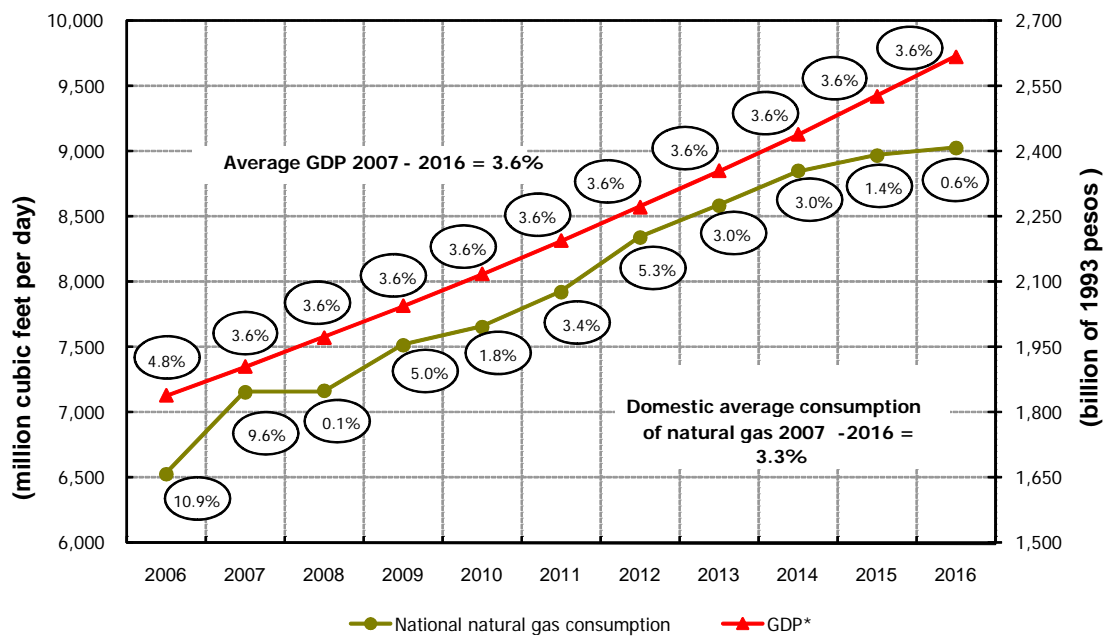
As a result of the variables mentioned before, domestic natural gas consumption will increase by an annual average of 3.3%, from 6,531 MMcfd in 2006 to 9,031 MMcfd in 2016.

Between 2006 and 2016, the total demand of natural gas will rise by 38.3%, which is equivalent to 2,500 MMcfd more by the end of the period, from which the electricity sector demand will represent 61.2%; the oil sector activities, 22.0%; and the industrial sector, 11.9%; while the rest will correspond to increases in activities of the other three sectors (see chart 1).

¹ It refers to investment scenario 7.5A version 4 of Pemex Exploración y Producción

Graph 1

Natural gas demand and GDP growth in Mexico, 2006-2016



*Figures refer to base year 1993.

Source: CAPEM and IMP.

Chart 1

Natural gas demand by sector, 2006-2016

(million cubic feet per day)

Sector	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total	6,531	7,160	7,166	7,522	7,662	7,926	8,345	8,592	8,850	8,976	9,031	3.3
Oil ¹	3,017	3,309	3,312	3,563	3,575	3,565	3,602	3,565	3,560	3,595	3,568	1.7
Electricity	2,390	2,733	2,691	2,753	2,820	3,051	3,362	3,602	3,826	3,883	3,919	5.1
Industrial	1,014	998	1,030	1,061	1,108	1,138	1,196	1,228	1,255	1,278	1,311	2.6
Residential	84	94	102	112	121	130	140	149	158	166	175	7.6
Services	23	22	24	26	28	30	32	34	36	38	40	5.6
Vehicle transport	2	5	6	8	10	11	12	14	15	16	18	24.1

¹ Includes gas lift.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.

1.1.1 Electricity sector

The purpose of the electricity sector's development study for the next 10 years is the estimation of future consumption trends and of the maximum demand of electricity at national, regional and sectoral levels. These estimates allow for the identification of capacity and energy requirements needed to meet demand, both through

sales of the public sector by Comisión Federal de Electricidad (CFE) and Luz y Fuerza del Centro (LFC) as well as by self-supply. Fuel demand planning can take place through this process responding to the country's current and future needs of electric power.

It is worth mentioning that opportunities for fuel diversification in electric power generation processes have started to appear and with it, the incorporation of new technologies is expected.

1.1.1.1 Natural gas demand for public power supply

As a result of the capacity expansion plans based on the use of combined-cycle technology in the electricity sector, most of the capacity increases by 2016 will come from that technology.

This shall bring a significant increase of natural gas demand throughout the period. The natural gas consumption of Independent Power Producers (IPP's) will have a relevant participation of 2,078.6 MMcfd in 2016, representing 58.8% of the gas required during the last year of the period for public power supply.

Since CFE's demand will increase from 836.5 MMcfd to 1,447.5 MMcfd between 2006 and 2016, the company is planning to convert turbogas plants into combined-cycle plants to increase electric power generation, and with it, its natural gas requirements. LFC in turn, will have a marginal contribution to demand: by 2016 its requirements will represent 0.2% of gas for public power supply.

Even in the presence of a considerable diversity of technologies available for the generation of electric power in the sector, the benefits of combined-cycle plants will make natural gas the dominant fuel. Natural gas will be followed by coal and fuel-oil, whose presence of 31.1% in 2006 will decrease significantly to 14.1% in 2016, whereas diesel will become marginal (see chart 2).

It shall be mentioned that the natural gas supply to some of the new plants will take place through liquefied natural gas regasification terminals, in addition to the natural gas supplied by Pemex.

Chart 2
Domestic fuel demand for public power supply, 2006-2016
(million cubic feet per day of equivalent natural gas)

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total	4,117.5	4,400.5	4,620.7	4,678.6	4,623.8	4,854.3	5,069.1	5,226.0	5,346.1	5,349.3	5,422.9	2.8
Comisión Federal de Electricidad	2,895.0	2,884.1	3,149.0	3,041.1	2,928.4	3,038.4	3,176.5	3,298.2	3,316.6	3,295.3	3,338.3	1.4
Luz y Fuerza del Centro	30.3	29.8	64.8	5.9	5.9	5.9	9.0	5.9	6.8	5.9	5.9	-15.1
Independent Power Production	1,192.1	1,486.6	1,406.9	1,631.6	1,689.5	1,810.0	1,883.5	1,921.9	2,022.7	2,048.1	2,078.7	5.7
Coal	736.6	769.2	764.4	761.3	815.5	855.1	848.4	838.3	880.8	979.8	1,118.6	4.3
Comisión Federal de Electricidad	736.6	769.2	764.4	761.3	815.5	855.1	848.4	838.3	880.8	979.8	1,118.6	4.3
Fuel oil	1,282.5	1,264.6	1,537.8	1,536.3	1,364.6	1,326.8	1,235.0	1,159.0	1,016.9	862.5	764.4	-5.0
Comisión Federal de Electricidad	1,282.5	1,264.6	1,537.8	1,536.3	1,364.6	1,326.8	1,235.0	1,159.0	1,016.9	862.5	764.4	-5.0
Diesel	39.7	6.7	9.6	10.4	8.4	7.9	10.8	13.4	9.6	11.1	7.8	-15.0
Comisión Federal de Electricidad	39.5	6.7	9.5	10.4	8.4	7.9	10.7	13.3	9.6	11.1	7.8	-15.0
Luz y Fuerza del Centro	-	-	-	-	-	-	-	-	-	-	-	n.a.
Independent Power Production	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-16.6
Natural gas	2,058.7	2,360.0	2,308.9	2,370.6	2,435.2	2,664.4	2,975.0	3,215.3	3,438.9	3,495.9	3,532.0	5.5
Comisión Federal de Electricidad	836.5	843.6	837.3	733.0	739.9	848.5	1,082.5	1,287.5	1,409.4	1,441.9	1,447.5	5.6
Luz y Fuerza del Centro	30.3	29.8	64.8	5.9	5.9	5.9	9.0	5.9	6.8	5.9	5.9	-15.1
Independent Power Production	1,191.9	1,486.5	1,406.8	1,631.6	1,689.4	1,810.0	1,883.5	1,921.8	2,022.6	2,048.0	2,078.6	5.7

n.a.: does not apply.

Source: IMP based on data from CFE, Pemex and private companies.

1.1.1.2 Self-generation of electric power

No relevant changes are foreseen in the consumption of natural gas for electricity self-generation and export during the 2006-2016 period. Growth in 2007 was due to a higher plant factor of existing equipment, and to the start of operations of four projects with a total capacity of 81 MW and a consumption of 2.4 MMcfd. There will be additional natural gas demand for self-generation from Energía Costa Azul, the operating company of the regasification terminal in Baja California. The generators shall start operations in two phases, the first one in 2008 and the second in 2010 (see chart 3).

The other substitute fuels show no relevant movements either. Private electric power generation in the coming years will experience a growth mainly through wind power in the Tehuantepec Isthmus, and through coal in the North of the country.

Chart 3
Fuel demand in the private electricity sector, 2006-2016
(million cubic feet per day of equivalent natural gas)

Sector	Product	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Electricity self-generation	Total	342.3	388.6	397.2	397.8	400.7	402.7	402.4	402.7	402.7	402.7	402.4	1.6
	Fuel oil	55.6	53.6	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	-0.3
	Petroleum coke	85.6	84.2	84.0	84.2	84.2	84.2	84.0	84.2	84.2	84.2	84.0	-0.2
	Diesel	5.7	12.7	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	8.8
	Natural gas	195.4	238.0	246.3	246.7	249.5	251.6	251.6	251.6	251.6	251.6	251.6	2.6
Electricity export	Natural gas	135.4	135.4	135.4	135.4	135.4	135.4	135.4	135.4	135.4	135.4	135.4	-

Source: IMP based on data from CFE, CRE, Pemex and private companies.

1.1.2 Industrial sector

Natural gas demand in the industrial sector is foreseen to grow at an average annual rate of 2.6% during 2006-2016. This figure is mainly explained by the industrial sector's economic activity, expected to grow at a rate of 3.4% in the next 10 years. The lower growth rate of natural gas is explained by improved efficiencies and by the progressive recomposing of the industry, in which branches with less energetic intensity grow faster than those that are more intensive (see chart 4).

During 2006, natural gas demand represented 54.3% of the sector's fuel demand, and by 2016, it is expected to increase to 58.1%. As a result of its use in the cement industry, petroleum coke's share is expected to reach 19.4%. The fuel-oil share will be 10.8% in 2016.

Chart 4
Regional natural gas demand of the industrial sector, 2006-2016
(million cubic feet per day)

Region	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total	1,014.0	997.5	1,030.0	1,061.1	1,108.1	1,137.9	1,196.3	1,228.3	1,254.7	1,278.0	1,311.5	2.6
Northwestern	26.5	24.4	24.6	24.8	25.5	26.1	27.0	27.8	28.2	28.7	29.4	1.0
Northeastern	371.4	347.9	361.7	375.4	399.7	408.9	420.3	430.2	438.6	448.0	460.4	2.2
Central-Western	287.7	293.8	300.0	307.9	317.3	325.4	334.1	342.7	350.5	355.8	366.0	2.4
Central	246.4	249.5	260.1	267.2	272.6	277.6	284.3	294.9	302.8	308.9	316.1	2.5
South-Southeastern	82.1	81.9	83.6	85.8	93.1	99.8	130.8	132.7	134.6	136.6	139.5	5.5

Source: IMP based on data from CRE, Pemex, Sener and private companies.

The projection of natural gas demand in the industrial sector was estimated in two stages. The first stage was based demand response to changes in the sector's energy efficiency, to economic growth and prices. This is called

tendency estimation, and was prepared by end-use groups². Later on, the estimate is complemented with demand of other fuels (LPG and fuel-oil) displaced by natural gas, known as estimate by substitution.

Tendency estimation

Tendency estimation can be broken down into twelve branches depending on the intensity of natural gas consumption and its relevance for the estimation of industrial demand (see chart 5).

The basic metal industry group will be the main consumer of natural gas. During 2006, this group's demand represented 29.0% of the total natural gas demand in the sector, and it's share is expected to decrease to 26.2% in the future due to the limited expansion probabilities of the group's production capacity.

A growth rate of 4.1% is expected between 2006 and 2016 in the chemical industry, where gas is mainly used in thermal and vapor energy generation processes. This annual increase is explained by the polyethylene and aromatics plants associated with the new Fénix (Phoenix) project, representing an increase of 28.6 MMcfd; the rest is explained by other activities of the chemical industry.

Metal products, machinery and equipment branches will represent 11.9% of the total natural gas demand of the sector in 2016, being the third most important group regarding natural gas demand.

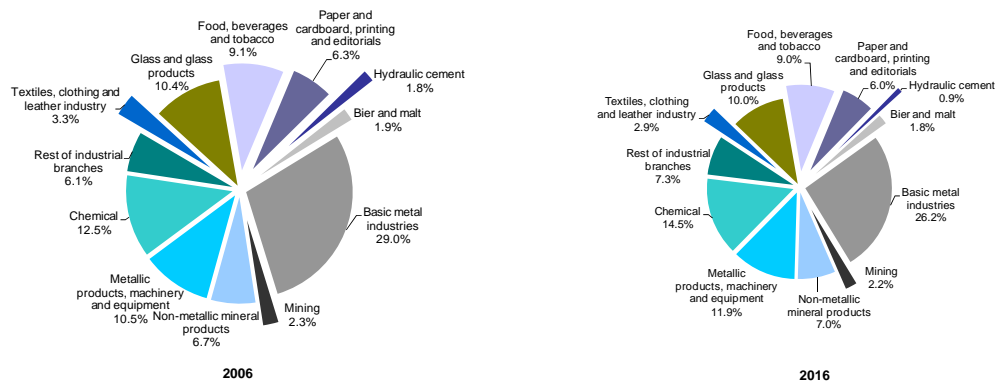
² See annex two for classification aspects.

Chart 5
Tendency demand by groups of the industrial sector's branches, 2006-2016
(million cubic feet per day)

Group of branches	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total	1,014.0	997.5	1,030.0	1,061.1	1,108.1	1,137.9	1,196.3	1,228.3	1,254.7	1,278.0	1,311.5	2.6
Basic metal industries	293.6	286.2	289.8	295.8	317.6	322.1	325.3	329.5	333.4	334.5	343.5	1.6
Chemical	127.1	126.9	130.5	134.4	137.8	141.8	174.6	178.4	182.2	186.3	190.8	4.1
Metal products, machinery and equipment	106.9	99.8	110.2	120.6	125.6	130.3	136.3	142.3	146.5	151.5	156.3	3.9
Glass and glass products	105.6	100.0	103.1	105.6	108.7	112.2	116.9	120.8	124.1	127.7	131.6	2.2
Food, beverages and tobacco	92.3	95.8	98.0	100.9	102.5	104.1	107.3	110.5	112.7	115.2	118.5	2.5
Non-metallic mineral products	68.3	69.1	71.3	73.3	75.6	78.2	81.4	84.2	86.5	89.1	91.8	3.0
Paper and cardboard, printing and editorials	63.8	67.2	68.9	69.9	71.8	73.2	74.7	75.9	76.8	77.9	79.3	2.2
Textiles, clothing and leather industry	33.9	33.6	33.9	34.1	34.4	34.8	35.3	36.0	36.7	37.4	38.4	1.2
Mining	23.8	25.7	25.5	25.6	26.2	26.5	27.1	27.6	27.7	27.9	28.5	1.8
Bier and malt	18.9	19.7	20.1	20.7	21.0	21.3	21.9	22.6	23.1	23.6	24.2	2.5
Hydraulic cement	18.1	17.7	17.0	16.3	15.7	15.0	14.4	13.9	13.3	12.8	12.3	-3.8
Rest of the branches	61.6	55.9	61.8	63.8	71.3	78.4	81.0	86.8	91.8	94.1	96.4	4.6

Source: IMP based on data from CRE, Pemex, Sener and private companies.

Graph 2
Structure of demand by groups of the industrial sector's branches,
2006 and 2016
(percentage share)



Source: IMP based on data from CRE, Pemex, Sener and private companies.



Regarding natural gas demand in the glass and glass products industry, its future increase will be largely determined by the behavior of the automotive and the bottling industries. Its annual average growth rate is expected to remain 2.2% throughout the prospective period, by the end of which its share will be 10.0% with respect to the total demand of natural gas in the sector.

The annual average growth rate of the food, beverages and tobacco group will be 2.5% for the outlook period. In this group of branches, the use of fuel-oil and LPG is expected to show a decreasing tendency, fostering the use of natural gas mainly for heat and vapor generation, and for sterilization, drying and cooking processes.

Natural gas demand in the non-metal mineral products branch will increase by 23.5 MMcfd throughout the period, to reach 91.8 MMcfd by the end thereof. The production of ceramics is the activity primarily expected to increase consumption.

In the paper industry, cellulose production is the most intensive energy consumption stage, thus the high import levels of cellulose explain the decrease in the share of natural gas demand for the activities of the paper, cardboard, printing and editorial group.

Substitution of other fuels by natural gas

Chart 6 shows the projected demand by estimation component, indicating that the preference to substitute LPG and fuel-oil by natural gas will be progressively increasing in the industrial sector until reaching 28.8 MMcfd in 2016. It is worth mentioning that this volume could be larger as relative prices and infrastructure development start favoring access to natural gas.

Chart 6
Industrial demand of natural gas by projection component, 2006-2016
(million cubic feet per day)

	Tendence	Substitution*	Total
2006	1,014.0	-	1,014.0
2007	990.9	6.7	997.5
2008	1,019.3	10.7	1,030.0
2009	1,050.1	11.0	1,061.1
2010	1,091.4	16.8	1,108.1
2011	1,116.0	21.9	1,137.9
2012	1,174.3	22.0	1,196.3
2013	1,202.8	25.5	1,228.3
2014	1,226.1	28.6	1,254.7
2015	1,249.4	28.7	1,278.0
2016	1,282.7	28.8	1,311.5

* Refers to the substitution of fuel oil and LP gas by the entry of the new industrial distribution infrastructure of natural gas.
Source: IMP based on data from CRE, Pemex, Sener and private companies.

1.1.3 The oil sector

In the oil sector, natural gas is used as fuel in pipelines, refineries, gas processing plants, pneumatic pumping, electric power generation, and as raw material, among others. Historically, the oil sector has been the largest consumer of natural gas at national levels; in fact, in 2006 it represented 46.2% of the total consumption. However, by 2013 the electricity sector demand will exceed that of the oil sector. In the next 10 years though, the oil sector's demand is expected to grow by 18.2%, reaching a volume of 3,568 MMcfd by the end of the projection period. From the expected increase, 58.8% will be due to internal recirculation to PEP's wells, and the rest will correspond to the share of self-consumed gas used by Pemex's subsidiaries.

The use of natural gas by Pemex Petroquímica (PPQ) shall behave differently: fuel gas will increase by 47.4 MMcfd between 2006 and 2016. On the other hand, its use as raw material will decrease by 21.0 MMcfd in the same period. The estimate of the use of natural gas as fuel gas obeys investment projects that will increase hydrocarbon consumption, mainly in the Complejo Petroquímico (CPQ) La Cangrejera, where ethylene, styrene, aromatics and low-density polyethylene (LDPE) production lines will be expanded. On the other hand, the use of gas as raw material will decrease in the analyzed period, since CPQ Independencia will stop operating its methanol plants, and only CPQ Cosoleacaque will continue operating on a continuous basis, mainly through the ammonium plant.

Chart 7

Natural gas demand of the oil sector, 2006-2016
(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total	3,017	3,309	3,312	3,563	3,575	3,565	3,602	3,565	3,560	3,595	3,568	1.7
Self consumption by Subsidiary	1,581	1,754	1,686	1,763	1,721	1,676	1,708	1,688	1,730	1,799	1,808	1.4
Exploración y Producción ¹	744	891	823	806	756	685	687	692	689	680	682	-0.9
Refinación	281	298	297	375	377	385	385	383	386	468	466	5.2
Gas y Petroquímica Básica	263	261	261	282	304	291	316	294	345	333	341	2.6
Petroquímica	292	303	304	299	283	314	318	318	309	318	318	0.9
Corporativo	0	0	0	0	0	0	0	0	0	0	0	0.8
Gas lift	1,436	1,555	1,626	1,800	1,854	1,889	1,894	1,876	1,831	1,795	1,760	2.1

¹ Includes consumption by Compañía Nitrógeno de Cantarell.

Source: Pemex.

Chart 8

Natural gas demand of Pemex Petroquímica, 2006-2016.
(million cubic feet per day)

Region	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total	292.0	303.2	304.2	299.4	283.4	314.4	318.4	318.4	309.4	318.4	318.4	0.9
Fuel	244.0	273.0	277.2	272.4	256.4	287.4	291.4	291.4	282.4	291.4	291.4	1.8
Raw material	48.0	30.2	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	-5.6

¹ Does not include potential natural gas consumption of the Fénix project.

Source: PPQ.

1.1.4 Residential and services sector

For the prospective period, the demand of natural gas of the residential and services sectors is expected to increase at an average rate of 7.2%, motivated mainly by the development of a larger number of housing facilities in geographic zones with natural gas distribution systems, and by the expansion of the distribution network. In contrast, an increase of 1.1% is expected in the demand of LPG in the same sector.

The demand of natural and LPG in 2016 will be 10.7 cubic feet per day of equivalent natural gas per inhabitant (see chart 9).

Natural gas demand growth in these sectors will slightly decrease due to a number of factors that tend to reduce consumption, among many others: greater efficiency of water heaters (application of NOM-003-ENER-2000), natural gas savings as a result of the substitution of stoves using pilot ignition by electronic equipment

that will reduce the amount of gas required for cooking by 10.0%, and the displacement of natural gas by electrical energy due to the use of microwave ovens.

Based on the above, savings in the residential and services sectors will represent 8.4 MMcfd in 2016, from which 6.2 MMcfd will correspond to the residential sector and 2.2 to the services sector (see graph 3).

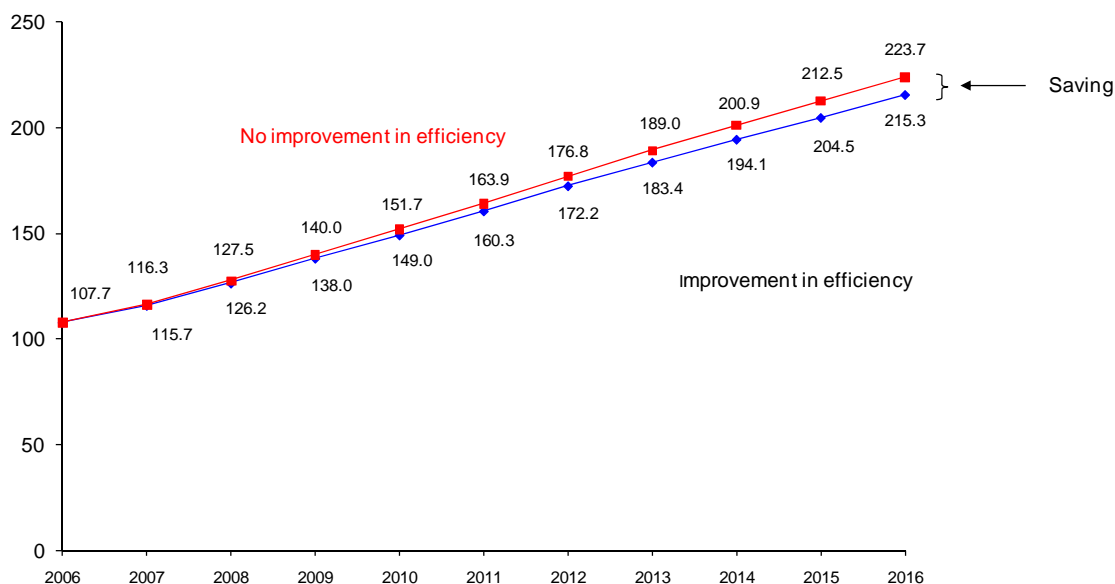
Chart 9
Demand of natural and LP gas, residential and services sectors, 2006-2016
(million cubic feet per day of equivalent natural gas)

Year	Natural gas	LP gas	Total	Natural gas penetration with respect to the total (%)	Inhabitants	Natural gas and LP gas consumption per inhabitant *	Growth (%)
2006	107.7	923.8	1,032	10.4	106,451,679	9.7	
2007	115.7	938.5	1,054	11.0	107,525,207	9.8	1.2
2008	126.2	953.6	1,080	11.7	108,576,411	9.9	1.4
2009	138.0	969.8	1,108	12.5	109,607,255	10.1	1.6
2010	149.0	982.1	1,131	13.2	110,619,340	10.2	1.2
2011	160.3	987.8	1,148	14.0	111,613,906	10.3	0.6
2012	172.2	991.2	1,163	14.8	112,591,898	10.3	0.5
2013	183.4	993.8	1,177	15.6	113,553,916	10.4	0.3
2014	194.1	997.3	1,191	16.3	114,500,185	10.4	0.4
2015	204.5	1,015.7	1,220	16.8	115,430,657	10.6	1.6
2016	215.3	1,033.7	1,249	17.2	116,344,933	10.7	1.6
aagr	7.2	1.1	1.9	5.1		0.9	

* Cubic feet per day.

Source: IMP based on data from CRE, Pemex, Sener and private companies.

Graph 3
Savings of natural gas in the residential and services sectors, 2006-2016
(million cubic feet per day of equivalent natural gas)

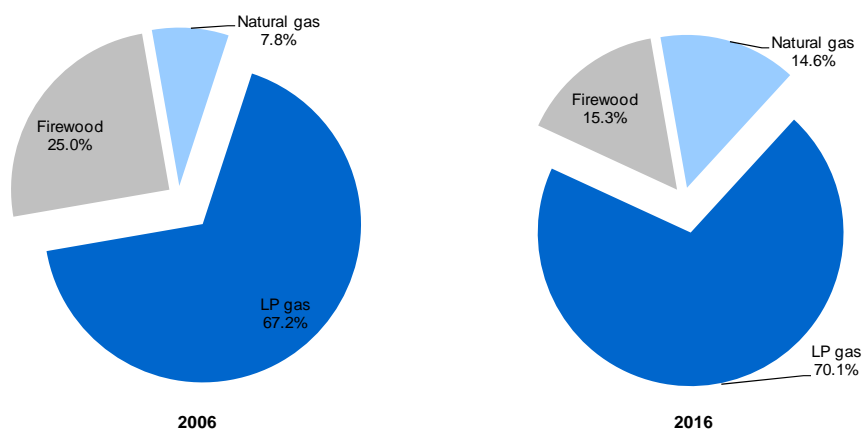


Source: IMP based on data from CRE, INEGI, Pemex, Sener and private companies.

Taking into account the three fuel types used in these sectors (natural gas, LPG and firewood), by the end of the prospective period natural gas will increase its share to represent 14.6% of the total, while LPG will represent 70.1% of this consumption. On the other hand, firewood will decrease from 25% in 2006 to 15.3% in 2016. This means that there will be a double substitution effect in these two fuels: the substitution of LPG by natural gas in geographic distribution zones, and then the substitution of firewood by LPG in rural zones (see graph 4).

Natural gas demand in the residential sector is mainly associated to water heating, cooking, the use of tumble dryers and air conditioning. Volumes in 2016 will represent 175.1 MMcfd, with a yearly average growth of 7.6%, fostered by the development of new housing facilities in the Northeast, Central and Central-Western regions. An important growth in natural gas distribution infrastructure is hence expected in these regions (see chart 10).

Graph 4
Fuel demand in the residential and services sectors, 2006 y2016
(percentage share)



Source: IMP, based on data from CRE, Pemex, Sener and private companies.

Chart 10
Natural gas demand by regions, residential sector, 2006-2016
(million cubic feet per day)

Region	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total	84.5	93.8	102.3	112.0	121.1	130.4	140.1	149.2	158.0	166.3	175.1	7.6
Northwestern	1.4	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.5	2.6	6.6
Northeastern	57.4	61.7	66.2	70.6	74.0	77.3	80.4	83.2	85.7	87.9	90.4	4.6
Central-Western	5.4	7.4	9.3	11.6	14.1	16.9	20.0	23.2	26.4	29.5	32.7	19.8
Central	20.3	22.9	24.9	27.9	30.9	34.0	37.3	40.4	43.4	46.2	49.1	9.2
South-Southeastern	-	-	-	-	-	-	0.0	0.1	0.1	0.2	0.3	n.a.

n.a.: does not apply.

Source: IMP, based on data from CRE, Pemex, Sener and private companies.

Chart 11

Natural gas demand by regions, services sector, 2006-2016
(million cubic feet per day)

Region	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total	23.3	21.9	23.9	26.0	27.8	29.9	32.1	34.1	36.2	38.1	40.2	5.6
Northwestern	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	4.2
Northeastern	16.4	17.0	17.9	19.0	19.9	20.8	21.8	22.6	23.5	24.3	25.2	4.4
Central-Western	2.2	1.7	2.1	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.8	10.0
Central	4.2	3.0	3.7	4.2	4.7	5.3	6.0	6.7	7.3	8.0	8.7	7.5
South-Southeasterr	0.2	-	-	-	-	-	0.0	0.0	0.1	0.1	0.1	-3.0

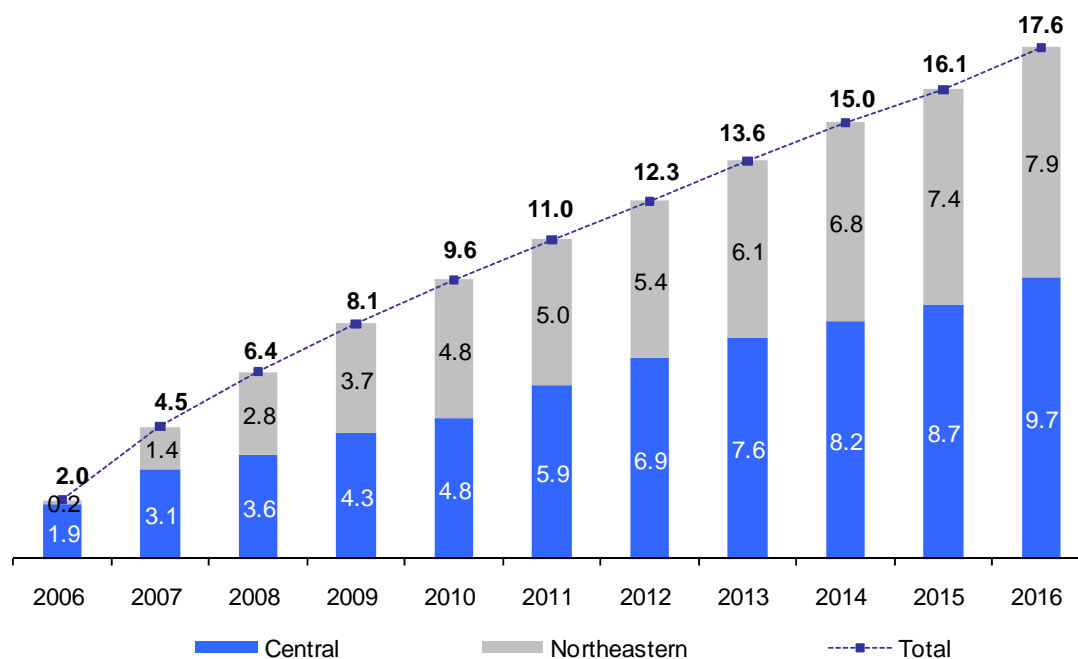
Source: IMP, based on data from CRE, Pemex, Sener and private companies.

Consumption in the services sector is mainly associated with hotels, restaurants, offices, hospitals, laundries, bakeries, dry cleaners and tortilla stores. Demand is expected to reach 40.2 MMcfd in 2016.

1.1.5 Vehicle transport sector

The consumption of natural gas in vehicles will grow at an average annual rate of 24.1% during 2006-2016, with an increase of 15.5 MMcfd, observed only in the Central and Northeastern regions (see graph 5).

Graph 5
Regional natural gas demand in the vehicle transport sector, 2006-2016
(million cubic feet per day)



Source: IMP, based on data from Pemex, Sener and private companies.

Fifty new service stations are expected to open and by the end of the period there will be 57 plants selling of natural gas for motor vehicles, representing an installed capacity of 66,411 m³/hour. Most of these stations will service passenger transportation vehicles, mainly taxi cabs, and buses. Other stations will serve government vehicles, while others will serve company car fleets.

Based on the expansion projects of distributing companies, the fleet operating with compressed natural gas (CNG) is expected to increase by 25,600 units throughout the period, being the country's Central area the region with the highest density, as a consequence of the notable dynamics of passenger transportation. Nonetheless, infrastructure growth and expansion policies observed in the Northeastern region will lead to vehicle fleet levels almost as high as that of the Central region (see chart 12).

Chart 12

Accrued stations and vehicle fleet using compressed natural gas by regions, 2006-2016
(units and thousands of units, respectively)

Region	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr
Total of stations	7	12	14	20	27	38	51	53	54	56	57	23.3
Total of vehicle fleet	2.8	5.4	7.9	10.2	12.5	14.8	17.2	19.7	22.5	25.2	28.4	26.2
Northeastern												
Stations (accrued units)	3	7	9	12	16	20	25	26	27	28	28	25.0
Vehicle fleet (thousands of units)	0.6	2.6	4.1	5.6	7.0	7.5	8.2	9.5	11.1	12.5	13.8	36.2
Central												
Stations (accrued units)	4	5	5	8	11	18	26	27	27	28	29	21.9
Vehicle fleet (thousands of units)	2.1	2.8	3.8	4.6	5.5	7.3	9.0	10.2	11.4	12.7	14.6	21.1

Source: IMP, based on data from Pemex, Sener and private companies.

The availability of grounds for the installation of new CNG service stations and fuel price expectations for motor vehicles influence the future demand of gas for this sector. The share of natural gas with respect to other energy sources is expected to continue at marginal levels, increasing from 0.04% in 2006 to 0.24% by 2016, considering the use of gasoline, LP gas and diesel.

The incorporation of new technologies into the domestic market by foreign companies will allow for relevant improvements in the performance of CNG vehicles. In addition, the costs of converting gasoline motors to CNG have been enormously reduced, which in the future may imply more competitive return rates with respect to those of LPG and diesel, and will result in greater user benefits in terms of economy, environment and safety.

Currently existing conversion systems, when compared to traditional systems, allow for a better control of gas ignition, thus improving combustion efficiency and preventing loss of power, which translates into improved performance, fuel saving, and reduction of pollutant emissions.

1.2 Natural gas supply

Natural gas supply for the next 10 years is the result of a planning process based on a project portfolio including investment opportunities associated to hydrocarbon reserves and prospective resources identified and documented in our country, according to the objectives and strategies of the 2007 Business Plan of Pemex Exploración y Producción (PEP).

PEP's 2007 business portfolio comprises a total of 81 projects, of which 6 are integrated exploration and exploitation projects (that is, they imply both the prospective search of hydrocarbons and the extractive activity of production of the reserves discovered or of existing reserves), 29 exploitation projects (that only consider the production of discovered reserves), 22 exploration projects and 24 infrastructure and support projects for the operation and maintenance of hydrocarbon transportation and distribution. Except for the infrastructure and

support projects, all other projects include the necessary investments related to industrial safety and environmental protection.

Taking into account PEP's 2007 portfolio, and for the purposes of this outlook, a so-called "proposed scenario" has been generated, linked to an annual average investment of 144 billion pesos in 2007 (13.2 billion dollars), with an average natural gas extraction expectation of 6,446 MMcf/d between 2007 and 2016. This budget ceiling includes investments required to maintain base production, such as the Pidiregas investments already authorized in strategic activities³.

1.2.1 Medium production scenario

For this outlook, the origin of the medium gas supply scenario is the scenario proposed by PEP, which acknowledges the production profiles of PEP's 2007 project portfolio, considering the possible development of reserves incorporated due to exploration activities, and investments in exploitation and exploration activities, possible deep water developments and the development of the Chicontepec project (also known as Aceite Terciario del Golfo).

PEP has projects that have already received authorization for financing in the next years and their development depends on budget adequacy, Pemex's financing capacity and the success of exploration activities. It is worth mentioning that the projection includes Financed Public Works Contracts (FPWC) authorized until the first half of 2007.

The most remarkable aspects of the proposed production scenario include:

- Average budget ceilings of 144 billion pesos (13.2 billion dollars). This physical investment will support the proposed scenario between 2007 and 2016. Out of it, 94 billion pesos (8.6 billion dollars) will be invested in the exploitation of existing fields, 25 billion pesos (2.3 billion dollars) in exploration of new fields and another 25 billion pesos (2.3 billion dollars) in future development;
- In exploration activities, great efforts are maintained in all onshore basins; nonetheless, activities are increasing both in shallow and deep waters;
- In exploitation, all currently relevant projects will continue, including Cantarell, Ku-Maloob-Zaap, Crudo Ligero Marino, Burgos and Veracruz. Activities in Chicontepec will increase considerably as of 2008; and
- Projects such as the exploration of Papaloapan B, the development of Alak-Kach and Samaria-Somero will be included; the inclusion of the development of Lakach will also be evaluated, and the projects of the Subdirection for Distribution and Trade are being separated to form a single project.

³ The supply scenario is located between the low and the outstanding scenarios of the Crude Oil Market Outlook 2007-2016.

The proposed scenario starts with a natural gas production of 5,356 MMcfd in 2006, reaching 6,907 MMcfd by 2016. This gas production scenario will be explained briefly in the following terms:

- By type of activity (exploration and exploitation)
- By project category
- By region
- By gas quality

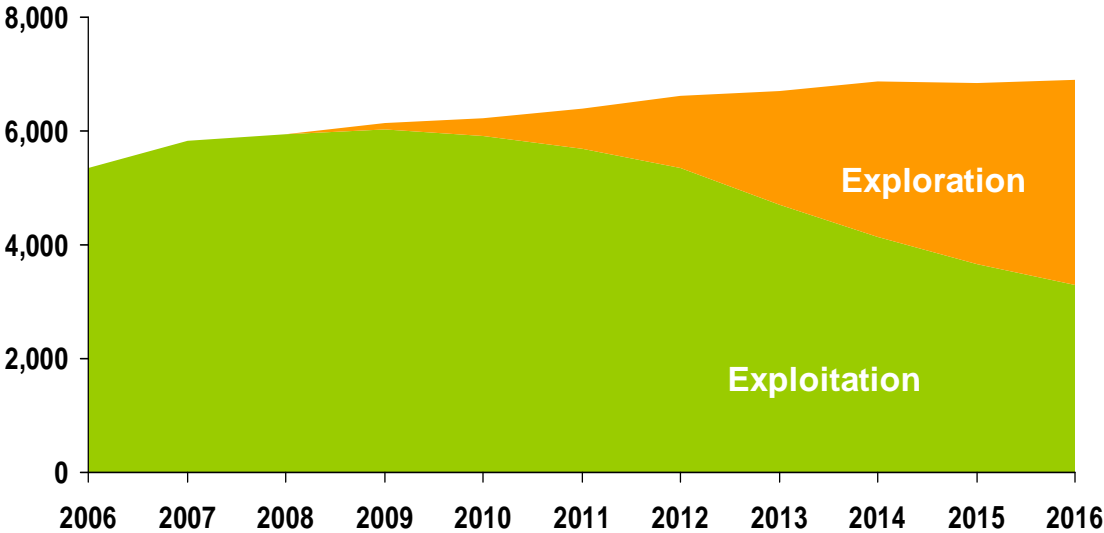
By activity

The proposed scenario in terms of gas exploration and exploitation activities, indicates the effective management of base production coming from fields and wells currently being exploited, how they will respond to different factors such as reservoir depletion, water-oil and gas-oil contact movement, and the way well productivity will be controlled. During the 2006-2016 period, production obtained from exploitation projects reaches its maximum contribution of 6,020 MMcfd in 2006, and starts declining as of that same year until reaching 3,305 MMcfd in the last year analyzed.

Regarding exploration activities, new production is in view as of 2009 with an expected volume of 110 MMcfd, and a planned contribution of 3,602 MMcfd by 2016, resulting from investments in onshore basins as well as in shallow and deep waters.

The expected behavior in the activities is first and foremost related to the decline of exploitation activities expected in the Burgos and Veracruz projects. This decline in exploitation shall be mitigated through contributions from the Chicontepec, Crudo Ligero Marino and FPWC projects. As of 2014, the natural gas production volume in the Burgos, Golfo de México B, Lamprea, Reforma Terciario, Delta del Bravo and Crudo Ligero Marino exploration projects will also be incorporated.

Graph 6
Natural gas production by type of activity, 2006-2016
(million cubic feet per day)



Source: Pemex Exploración y Producción.

By project category

This classification of the proposed scenario shows the diversification of large projects considered in PEP's portfolio. The gas production portfolio was been classified into the following projects:

- Exploitation (without Chicontepec and Cantarell),
- Cantarell,
- Chicontepec,
- Financed Public Works Contracts,
- Exploration (without deep waters) and
- Deep waters.

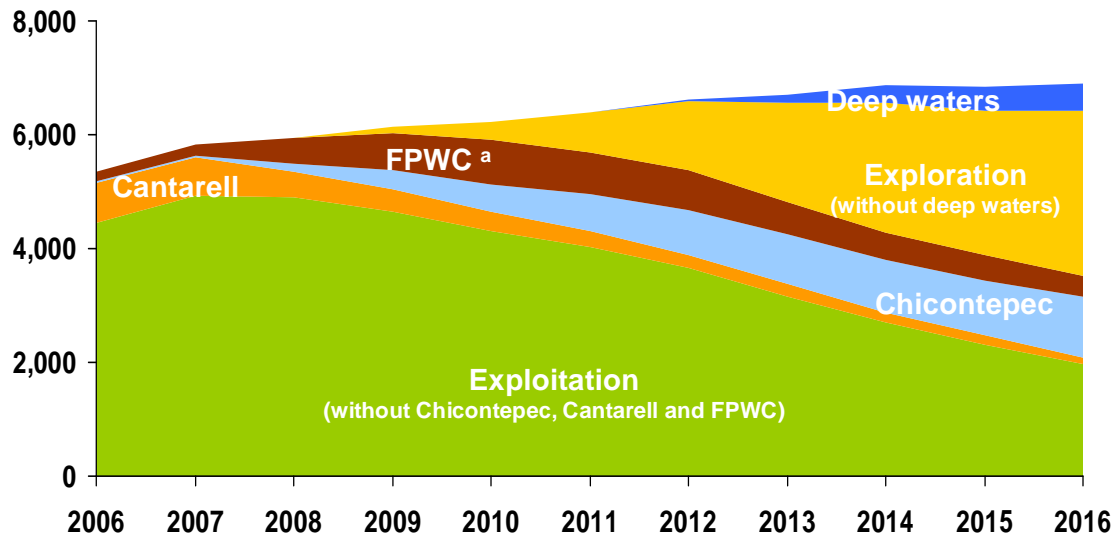
One of the main concerns regarding the 2007 project portfolio is the Cantarell Project's management, mainly because of what this project has represented in the country's hydrocarbon production for several decades. Although this reservoir still has a greater impact on crude production, its decline also affects the natural gas supply. During 2006, Cantarell contributed 716 MMcfd to domestic production, and a fast decline of 15.5% per year is now expected until reaching a contribution of 133 MMcfd by 2016. The production decline will be mainly offset by the development achieved in FPWC and Chicontepec.

The administrative planning of Cantarell is aimed at maximizing hydrocarbon production through a tertiary recovery project, so that the production scenario also envisages a pressure maintenance project. In addition, marginal production related to the reservoir in terms of exploration is expected in 2012.

As for deep water projects, PEP's definition considers water depths exceeding 500 meters (m). This definition alludes to the fact that at this depth PEP changes the technology used for the development of these fields.

Natural gas production from deep waters will start in 2012, and shall become relevant by 2014 when an estimated production of 321 MMcfd is expected, with an incremental tendency projected to reach nearly 500 MMcfd in 2016.

Graph 7
Natural gas production by type of project sub-category, 2006-2016
(million cubic feet per day)



^a Refers to Financed Public Works Contracts.
 Source: Pemex Exploración y Producción.

By region

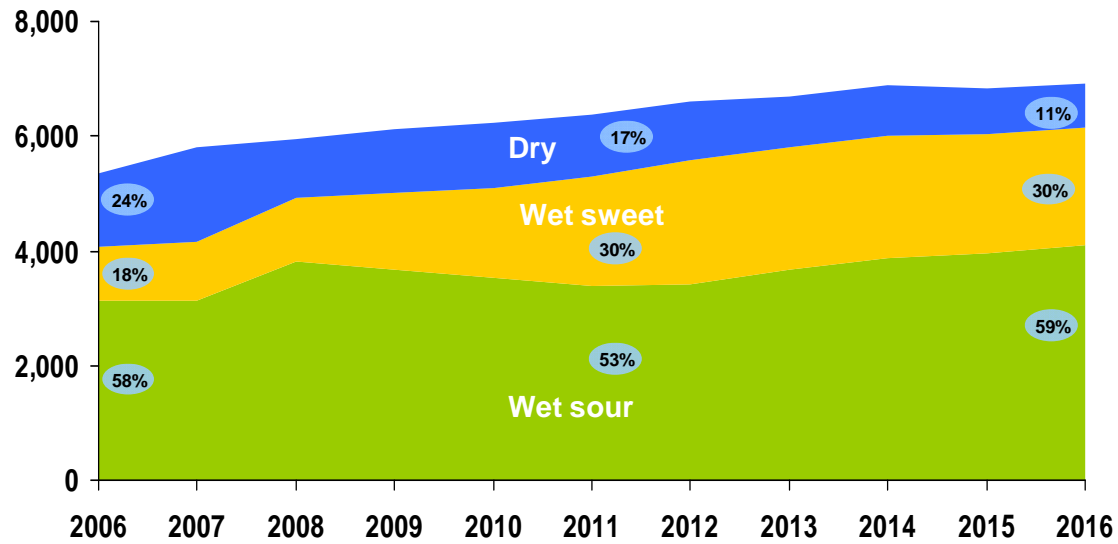
From a regional standpoint, natural gas production in the Northern Region is expected to increase its contribution to domestic production, reaching its maximum in 2012 with 3,483 MMcfd, representing 52.6% of the total for that year, while keeping a share of 50% of the total by the end of the analyzed period. Increase will result from the development of the Burgos, Lamprea and Delta del Bravo projects.

By gas quality

Expected trends on the production scenario regarding gas quality will evidently change due to the decrease of wet sour gas and the increase of wet sweet gas. The behavior of the first mainly obeys the decline of the fields of Veracruz, Cantarell, Complejo Antonio J. Bermúdez and San Manuel. This occurs in the first years, but share in the production due to exploration projects will increase until reaching 59% of the production by 2016.

Increase in wet sweet gas production will mainly be due to the contribution of the Burgos, Chicontepec, FPWC and Veracruz projects, while dry gas production will come from the Lamprea, Reforma Terciario, Delta del Bravo, Simojovel and Cuichapa projects.

Graph 8
Natural gas production by type of quality, 2006-2016
(million cubic feet per day)



Source: Pemex Exploración y Producción.

1.2.2 Financed Public Works Contracts

Financed Public Works Contracts⁴ (FPWC) are a response to the search for new contracting schemes to execute certain investment projects of PEMEX. This new contracting scheme was developed in strict observance of Mexico's Political Constitution, and the laws and regulations related to the oil industry.

The purpose of this scheme is to increase hydrocarbon production in Mexico, to exploit the country's natural resources and to reduce natural gas imports. As of 2006, these contracts are part of the Pidiregas projects.

They are public works contracts based on unit prices that combine different services in a single unit. Through this mechanism, Petróleos Mexicanos keeps the rights and ownership of hydrocarbons extracted and works constructed, at the same time of having access to additional execution, technology and financing capacities to perform well development, infrastructure and maintenance works. These contracts do not provide for the participation of contractors in production or in the profits obtained from the projects.

Contracts in force until the end of 2006, located in the Burgos basin, have the purpose of developing non-associated natural gas reserves. Between 2003 and 2005, two bidding rounds took place resulting in the signing of seven contracts corresponding to the Reynosa-Monterrey, Cuervito, Misión, Fronterizo and Olmos blocks in the first round, and Pandura-Anáhuac, and Pirineo in the second round.

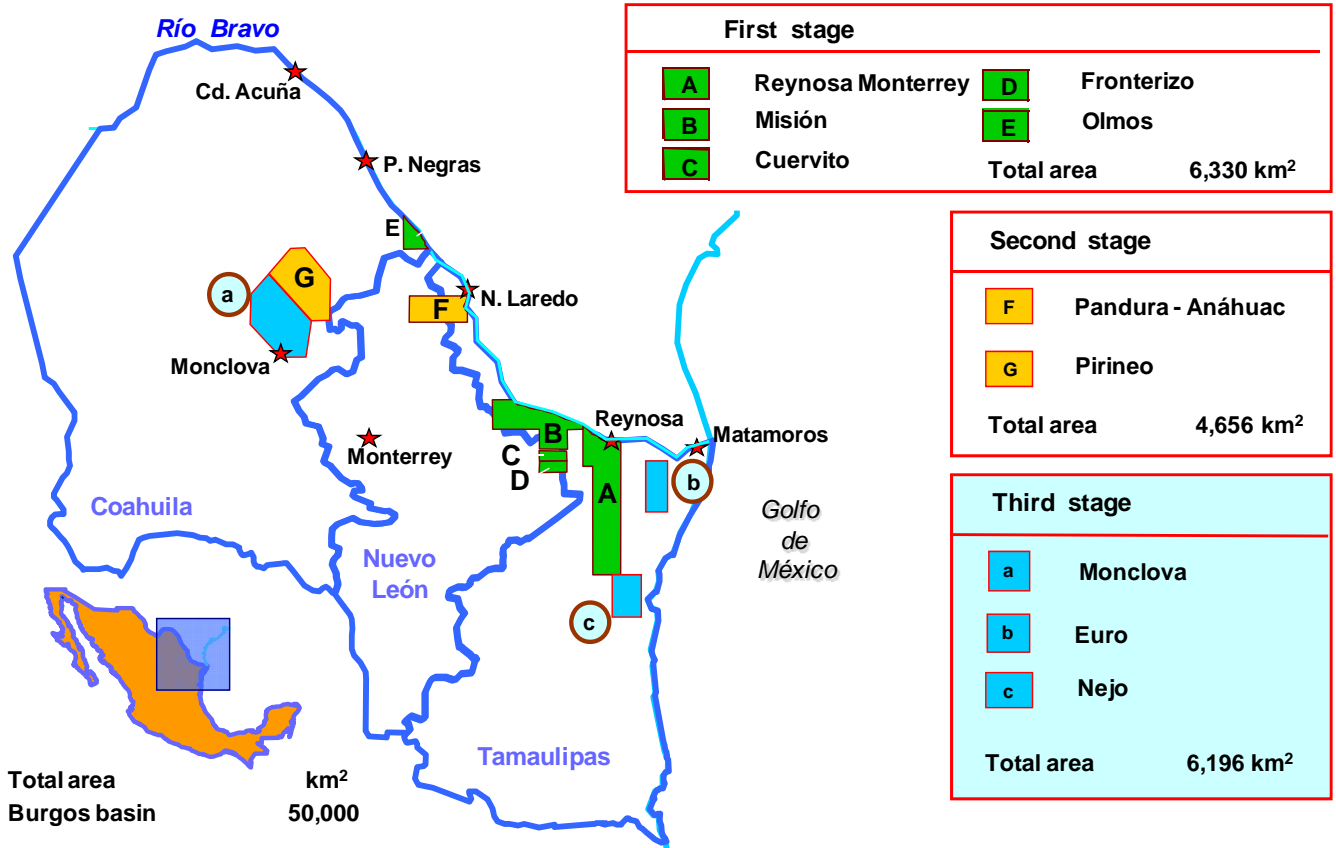
The third bidding round considers the Nejo, Monclova and Euro blocks, jointly covering an area of 6,196 square kilometers. The corresponding international public bids were published in the Daily Gazette of the Federation on August 10, 2006. Works related to this bidding round will allow the capitalization of investments in the Burgos basin, decreasing the decline rate of reservoirs located in this region, and benefiting from the experience generated through the drilling of the first multilateral well in carbonate rocks.

Works implemented in 2006 under these contracts allowed for the completion of 62 development wells and five wildcats, and a production of 138 MMcfd of natural gas.

⁴ Formerly known as Multiple Service Contracts.

Map 1

Bid area in Financed Public Works Contracts



Source: Pemex Exploración y Producción.

1.2.3 Availability of natural gas from PEP to PGPB

According to the scenario proposed by PEP, the availability of natural gas to PGPB will have a positive tendency during the 2007-2016 period, reaching a maximum of 6,848 MMcfd in 2014. Under this scenario, the Northern Region will remain the main natural gas supplier. This region will experience the highest annual growth rate in the period, ascending to 4.1%, influenced mainly by the development of the Chicontepec project.

The production of natural gas delivered by PEP to PGPB during the period will be based on increases of wet sweet gas delivery. This type of gas will experience annual increases of 9.6% between 2006 and 2016. By 2016, a volume of 2,567 MMcfd of wet sweet gas will be processed at the cryogenic plants; 3,137 MMcfd will be wet sour gas arriving at the sweetening plants and, as a complement, 1,021 MMcfd of direct dry gas from producing fields will be injected into the NGS (National Gas Pipeline System).

1.3 Investments in PGPB for the processing and transportation of natural gas

PGPB's investment program for the 2008-2016 period⁵ foresees an annual average increase of 2.3% in the availability of natural gas for the Organism in the 2006-2016 period, supported mainly by the increase of supply in the Northern Region, and in particular by the development of the Aceite Terciario del Golfo (Chicontepec) asset team.

This program contemplates the investment of 54.6 billion pesos (5.0 billion dollars) at 2007 prices during the analyzed period, focusing mainly on projects to guarantee the processing of PEP's gas supply and operate the company's asset teams under the best practices in safety, health and environmental protection, in accordance with the strategic priorities of the Organism.

In this context, 60% of the resources mentioned (32.9 billion pesos – 3.0 billion dollars) will be invested in projects to face the additional supply of natural gas, and 34% (18.4 billion pesos – 1.7 billion dollars) in projects to reach excellence in maintenance and continue operating the facilities in a safe and efficient way. In the second place, and to reliably attend the demand of hydrocarbon traded by PGPB, 2.8 billion pesos (0.3 billion dollars) will aim to guarantee the transportation of gas and products, 257 million pesos (23.5 million dollars) to technological and systems integration, and 187 million pesos (17.1 million dollars) to the administration of processes. The total of investments foreseen for the period is classified in chart 13.

With these resources, sour gas processing capacity will increase by 5%, sulfur recovery by 3%, liquid recovery by 30% and hydrocarbon fracturing by 9%, as shown in chart 14.

To satisfy the above, the construction of the following projects stands out:

- Two modular cryogenic plants in the Burgos Gas Processing Complex, of 200 MMcfd each.
- Four cryogenic plants in the Poza Rica Area, with a joint capacity of 700 MMcfd.

⁵ Based on the hydrocarbon scenario of PEP called 7.5A V.4 and on the PGPB Project Investment Portfolio from May 2007.

- Two integral projects, their site still to be defined, to process gas supply from the Delta del Bravo and Deep Waters projects, with a cryogenic capacity of 200 MMcfd and 450 MMcfd, respectively.
- Increase of wet sour gas processing at the Arenque Gas Processing Complex
- One cryogenic plant with a capacity of 300 MMcfd in the Coatzacoalcos Area

Chart 13**Investments of PGPB, 2008-2016**

Type of project	Millions of pesos	Percentage
Strategic projects	26,357	48%
Operative projects	22,319	41%
Pidiregas amortization	5,967	11%
Total	54,643	100%

Source: PGPB.

Chart 14**Gas processing projects of PGPB, 2007-2016¹**

Product	Capacidad 2007	Capacidad 2016	Incremento
Gas sweetening (MMpcd)	4,542	4,778	236
Sulfur recovery (Tpd)	3,376	3,491	115
Liquid recovery (MMpcd)	5,551	7,222	1,671
C2+ fracturing (Mbd)	577	628	51

Source: PGPB.

Chart 15**Gas transportation projects of PGPB, 2008-2016**

<i>Project</i>	<i>Start of operation</i>	<i>HP capacity</i>
Compression stations		
Emiliano Zapata	2008	35,000
Santa Ana	2010	24,000
Omealca	2011	14,300
Norte ¹	2009-2014	63,400
Soto la Marina y Macarela	2012	42,000
Gas pipelines		
	<i>Start of operation</i>	<i>mmpcd capacity</i>
Matamoros-Campo Brasil	2013	131
Petrochemical pipelines		
	<i>Product</i>	<i>Diameter/length</i>
Cd. Pemex-Nvo. Pemex	C ₂ +	16" x 70 km.
Cd. Pemex-Nvo. Pemex-Cactus	C ₃ +	16" x 81 km.
Cactus-Nvo. Pemex-cangrejera	C ₂ +	24" x 140 km.

¹ Includes the construction of Dorado, Cabrito and Rafael stations, as well as the revamping of the Santa Catarina station in 2 stages: 2009 and 2014.

Source: PGPB.

Regarding transportation, the main projects awaiting development are shown in chart 15.

With the above investments, PGPB will have the elements to face hydrocarbon supply from PEP, guaranteeing optimal use and operating asset teams in a safe and reliable manner, aimed at obtaining the maximum Economic Value Added in the company's operations.

1.4 Liquefied natural gas

In order to guarantee hydrocarbon supply, strategies have been established for the diversification of natural gas supply sources as part of the domestic energy policy. This has fostered the use of regasification terminals to import liquefied natural gas (LNG). For the planning of its scenarios, *The Natural Gas Market Outlook, 2007-2016*, includes the imports of the terminals of Altamira, Ensenada and Manzanillo for the studied horizon.

On September 30, 2006, the Altamira terminal, in the state of Tamaulipas initiated business operations, being the first LNG terminal in Mexico. By the end of the year, the terminal had delivered 79 MMcfd, which CFE accounted for in some of its generating plants. According to CFE's plans and Gas del Litoral's (operator of the LNG terminal in Altamira), in 2007 they expect 340 MMcfd of regasified volume, and by 2009, 500 MMcfd of LNG imported in Altamira will be consumed.

The construction of the LNG terminal in Altamira required an investment of 440 million dollars, and was developed by the consortium known as Shell Gas B. V. / Total Gaz / Mitsui Co.⁶ In this sense, among the loads that Total Gaz plans to bring as of 2009 are those coming from a new liquefaction plant in Yemen, the first liquefaction train of which shall be ready in 2008 and the second, in 2009.

⁶ Shares in the consortium are as follows: Shell 50%; Total 25%; and Mitsui 25%.

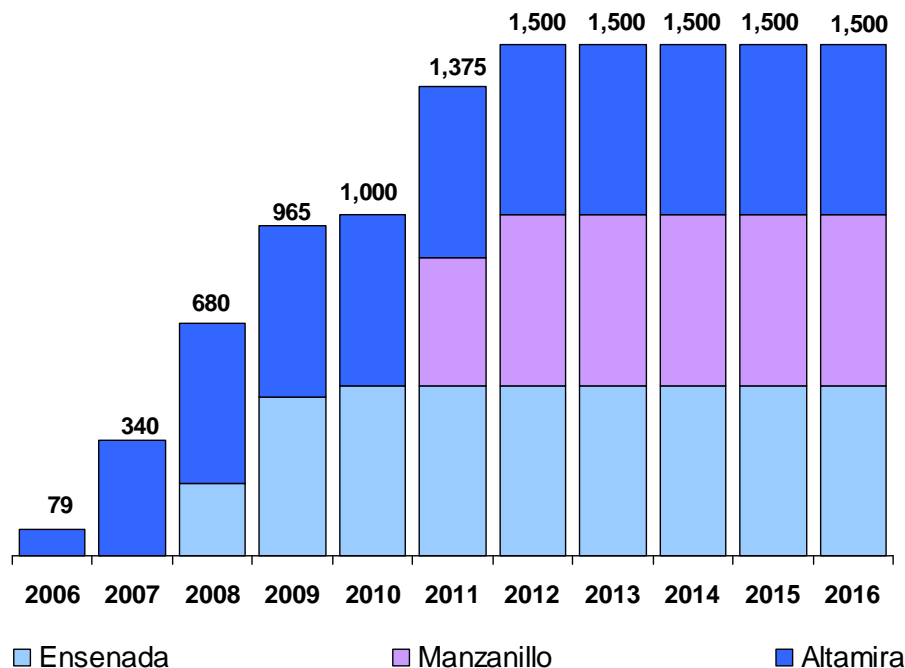
On the other hand, Sempra Energy is undertaking the construction of a terminal for the reception, storage and regasification of LNG through its subsidiary, Energía Costa Azul, in a site located approximately 25 kilometers to the north of Ensenada, in the state of Baja California. In this place, the company has acquired a land with access to the deep waters of this coast according to the project's needs.

The Energía Costa Azul project represents an investment of approximately 875 million dollars, and shall have the capacity to send up to 1,000 MMcfd to the market. By July 2007, the construction of this project had made a progress of more than 84% and it is continuing on-schedule to start operations in the beginning of 2008. This will be the first LNG project on the west coast of North America; with it, Mexico will become the first country ever to possess LNG infrastructures both in the Gulf of Mexico and on the Pacific.

Gas processed by this terminal will be used by power plants and industries of the region through a new 72.42 kilometer (45 miles) long pipeline that will interconnect the existing pipelines of the area (Bajanorte Gas Pipeline). Though the project shall have an initial processing capacity of 1,000 MMcfd of natural gas, with expansion possibilities depending on the market demand, the Ministry of Energy is only aware of the distribution of the volume to be marketed by Sempra, and 500 MMcfd to be marketed by Shell. Sempra is therefore expected to regasify 210 MMcfd in the first year (2008), reaching 500 MMcfd by 2010.

In addition, another plant will be installed in Manzanillo, Colima State, in 2011. This project is lead by CFE and will handle an average consumption of 375 MMcfd in 2011; afterwards it will reach 500 MMcfd. Gas will be used mainly for power generation centers to be revamped in Manzanillo, and of two combined-cycle plants located in Guadalajara (see graph 9).

Graph 9
Liquefied natural gas imports, 2006-2016
(million cubic feet per day)



Source: Sener.

1.5 Prospective balance of natural gas supply-demand, 2006-2016

In the prospective cycle of 2006-2016, less dynamic growth is expected in the domestic demand of natural gas regarding the historical period. While domestic demand increased to 6.2% in the last decade, in the period in question it will increase by 3.3%.

The factors contributing to the reduction of demand foreseen with respect to other scenarios include the following:

- Moderate economic growth rates,
- an improved understanding of the relationship between the growth rates of the economy, of the demand of electricity and the demand of natural gas as a substitute fuel in the industrial sector, and
- an impulse toward the diversification of energy sources for electric power generation.

Even so, the growth of natural gas demand will, without doubt, be one of the most dynamic processes on the domestic energy source market. In this way, by 2016, the estimated natural gas demand will reach 9,031 MMcfd. In

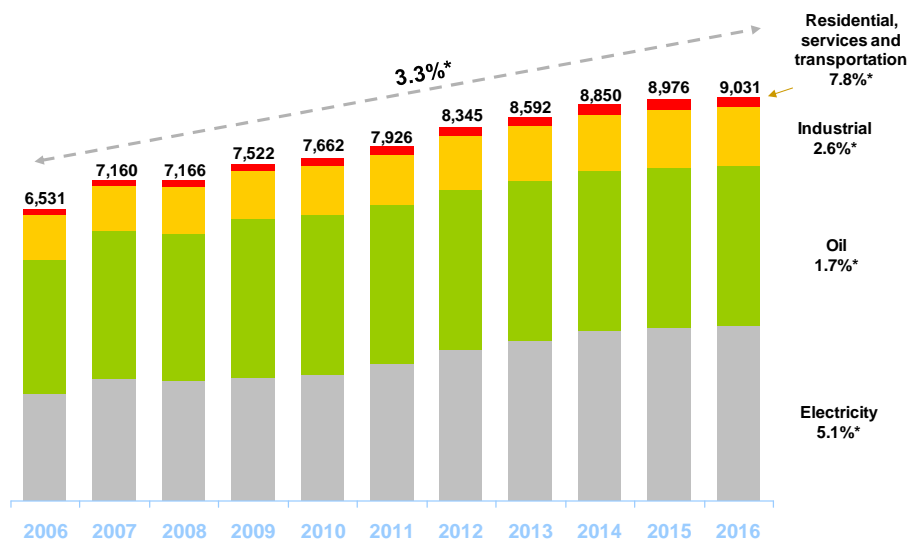
the future, most of the demand of natural gas will come from the electricity sector, which is expected to grow at an average rate of 5.1% in the 2006-2016 period, increasing to 1,529 MMcfd. The oil⁷ and the industrial sectors will follow in importance, presenting growths of 550 and 297 MMcfd, respectively, between 2006 and 2016. It is important to point out that sectors with smaller participation in consumption will experience great dynamism in their demand during the decade. The industrial, services and vehicle transport sectors' demand will jointly increase at a mean annual rate of 7.8% during the period analyzed (see graph 10).

Domestic supply will grow at a rate of 3.3% in the 2006-2016 period, producing 7,642 MMcfd in the last year. Production levels will result from onshore basins, and from an increase of activities both in shallow and in deep waters planned by PEP, continuing at the same time the currently most relevant exploitation projects of Cantarell, Ku-Maloob-Zaap, Crudo Ligerio Marino, Burgos and Veracruz; moreover, activities in Chicontepec will significantly increase as of 2008.

PGPB would have incremental natural gas availability at an average annual rate of 2.3% during the period as a backup from these projects, investing 54.6 billion pesos (5.0 million dollars) at 2007 prices, oriented mainly at projects that ensure the processing of PEP's gas supply and at operating the asset teams of the company, applying the best safety, health and environmental protection practices. So, between both subsidiaries, there will be a supply exceeding 7,000 MMcfd as of 2009, reaching a maximum of 7,702 MMcfd in 2014, based mainly on the increase of supply in the Northern Region, in particular in the development of the Aceite Terciario del Golfo (Chicontepec) asset team.

⁷ Including PEP's internal recirculation.

Graph 10
Domestic natural gas demand by sector, 2006-2016
(million cubic feet per day)



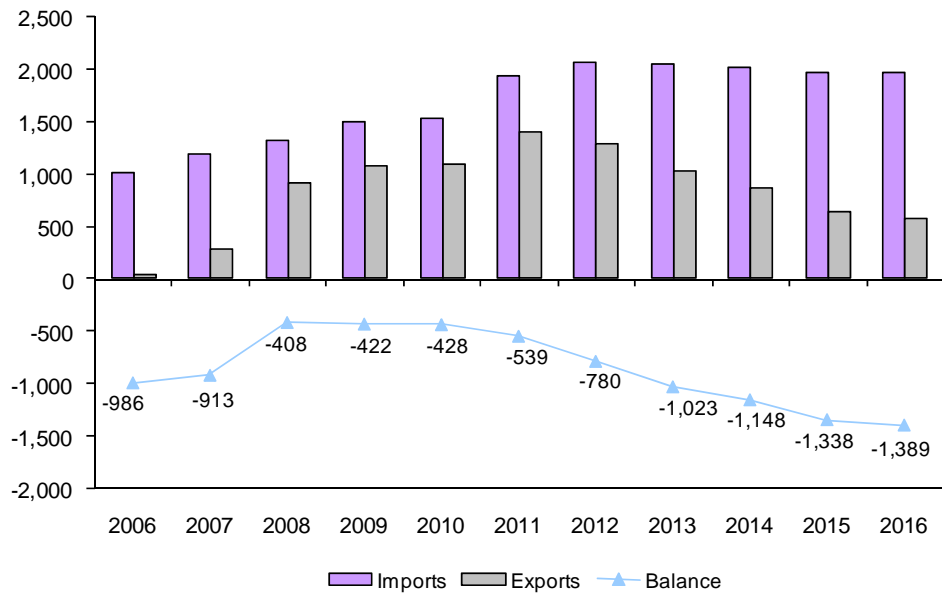
* Annual average growth rate 2006-2016.

Source: Sener.

Foreign trade in natural gas is expected to be very dynamic, with a net deficit of 1,389 MMcfd by 2016. Natural gas imports are expected to increase 92.6% with respect to 2006, registering a volume of 1,962 MMcfd, of which 1,500 MMcfd will come from LNG contracts at three regasification terminals, contemplated in the period of analysis.

The LNG terminal in Ensenada is scheduled to start operations in 2008 while Manzanillo terminal will begin in 2011, generating a diversified natural gas supply capacity in Mexico for the next 10 years, decreasing thereby imports through the pipelines connected to the United States, and reversing flows at the border points of the State of Baja California thank to the start of operations of the LNG terminal in Ensenada.

Graph 11
Foreign trade balance of natural gas, 2006-2016
(million cubic feet per day)



Source: Sener, based on data from CFE, CRE, Pemex and IMP.

Chart 16

Domestic natural gas balance, 2006-2016. Base scenario

Base demand – medium supply

(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr 2006-2016
Origin	6,561	7,452	8,078	8,594	8,760	9,327	9,622	9,619	9,715	9,606	9,603	3.9
Domestic production	5,543	6,259	6,758	7,100	7,233	7,387	7,565	7,569	7,702	7,638	7,642	3.3
Gas from PEP for operation ¹	470	603	479	457	396	318	324	340	351	354	368	-2.4
Gas from PEP for recirculation	386	607	650	807	888	987	1,081	1,149	1,188	1,216	1,262	12.6
Gas from PEP directly to Refining	2	1	-	-	4	12	11	8	5	2	-	n.a.
Production of PGPB plants	3,445	3,662	4,019	4,284	4,485	4,768	4,929	4,936	4,966	4,917	4,949	3.7
Directly from fields	1,152	1,326	1,456	1,403	1,304	1,150	1,117	1,055	1,124	1,092	1,021	-1.2
Ethane injected into pipelines	87	60	131	127	133	130	87	77	68	57	42	-7.1
Other currents	1	0	22	22	23	22	16	5	-	-	-	n.a.
Import	1,018	1,192	1,320	1,494	1,526	1,940	2,058	2,050	2,014	1,969	1,962	6.8
Import for logistic purposes	773	842	640	529	526	565	558	550	514	469	462	-5.0
Import by PGPB for balance purposes	167	11	-	-	-	-	-	-	-	-	-	n.a.
Import of liquefied natural gas	79	340	680	965	1,000	1,375	1,500	1,500	1,500	1,500	1,500	34.3
Destination	6,563	7,440	8,078	8,594	8,760	9,327	9,622	9,619	9,715	9,606	9,603	3.9
Domestic demand	6,531	7,160	7,166	7,522	7,662	7,926	8,345	8,592	8,850	8,976	9,031	3.3
Oil sector	1,581	1,754	1,686	1,763	1,721	1,676	1,708	1,688	1,730	1,799	1,808	1.4
Pemex Exploración y Producción ²	744	891	823	806	756	685	687	692	689	680	682	-0.9
Pemex Refinación	281	298	297	375	377	385	385	383	386	468	466	5.2
Pemex Gas y Petroquímica Básica	263	261	261	282	304	291	316	294	345	333	341	2.6
Pemex Petroquímica	292	303	304	299	283	314	318	318	309	318	318	0.9
Pemex Corporativo	0	0	0	0	0	0	0	0	0	0	0	0.8
Oil sector gas lift ³	1,436	1,555	1,626	1,800	1,854	1,889	1,894	1,876	1,831	1,795	1,760	2.1
Industrial sector	1,014	998	1,030	1,061	1,108	1,138	1,196	1,228	1,255	1,278	1,311	2.6
Electricity sector	2,390	2,733	2,691	2,753	2,820	3,051	3,362	3,602	3,826	3,883	3,919	5.1
Public	2,059	2,360	2,309	2,371	2,435	2,664	2,975	3,215	3,439	3,496	3,532	5.5
Comisión Federal de Electricidad	836	844	837	733	740	849	1,082	1,288	1,409	1,442	1,448	5.6
Luz y Fuerza del Centro	30	30	65	6	6	6	9	6	7	6	6	-15.1
Independent Power Producers	1,192	1,487	1,407	1,632	1,689	1,810	1,883	1,922	2,023	2,048	2,079	5.7
Private	331	373	382	382	385	387	387	387	387	387	387	1.6
Self-generation of electricity	195	238	246	247	250	252	252	252	252	252	252	2.6
Electricity export	135	135	135	135	135	135	135	135	135	135	135	0.0
Residential sector	84	94	102	112	121	130	140	149	158	166	175	7.6
Services sector	23	22	24	26	28	30	32	34	36	38	40	5.6
Vehicle transportation sector	2	5	6	8	10	11	12	14	15	16	18	24.1
Export	33	280	913	1,072	1,098	1,401	1,278	1,027	865	630	572	33.1
PGPB export	33	280	845	914	918	1,240	1,129	876	713	478	430	29.4
Export by private entities	-	-	68	158	180	161	149	151	153	153	142	n.a.
Inventories variation and differences*	-2.3	12	-	-	-	-	-	-	-	-	-	n.a.

n.a.: does not apply.

¹ For balance purposes, the mixture of gas provided for in this item is considered equivalent to dry gas.² Includes consumption by Compañía de Nitrógeno Cantarell as of 2000.³ This volume will not be consumed, only recirculated to producing wells.

* Includes differences and packing.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.

1.6 Natural gas balances by region

This section presents the regional balances that integrate the domestic natural gas balance. The scenario corresponds to base supply and demand, where every balance is based on the last available historical data (2006) and includes projections until 2016.

1.6.1 Northwestern Region

The Northwestern region will continue to be an exclusively importer zone, since logistically this region will remain isolated from the NGS (National Gas Pipeline System). In terms of demand by sectors, the consumption of natural gas used for electric power generation will prevail, representing 93.4% in 2016 within the region.

It will be followed by the industrial sector with 5.9% of the regional demand in the same year, reaching 29 MMcfd that could become a historical maximum of this sector within the region.

To satisfy demand in the region, with the start of operations of the regasification terminal in Ensenada as of 2008, the entire consumption of Baja California state will be covered by LNG imports, while consumption in Sonora will be covered by imports through the gas pipelines on the US border.

By the end of the prospective period, 77.9% of the imports to cover the demand of gas will come from LNG. With the regasification terminal, natural gas exports are expected to be marketed in the South of the United States, mainly in Arizona. These exports will reach 142 MMcfd by the end of the projected period, reaching a maximum of 180 MMcfd in 2010. It is worth mentioning that the company Shell could market another 500 MMcfd that would arrive at the same terminal of the Costa Azul project; however, this part of the project is not included in the prospective scenarios (see chart 17).

Chart 17
Natural gas balance of the Northwestern Region, 2006-2016
(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr 2006-2016
Origin	392	394	462	625	666	672	673	671	670	649	642	5.0
Regional production	-	-	-	-	-	-	-	-	-	-	-	-
Import	392	394	462	625	666	672	673	671	670	649	642	5.0
Import for logistic purposes	392	394	251	160	166	172	173	171	170	149	142	-9.7
Imports by PGPB for balance purposes	-	-	-	-	-	-	-	-	-	-	-	-
Import of liquefied natural gas	-	-	210	465	500	500	500	500	500	500	500	n.a.
From other regions	-	-	-	-	-	-	-	-	-	-	-	-
Destination	391	394	462	625	666	672	673	671	670	649	642	5.1
Regional demand	391	394	394	468	486	511	524	520	517	496	499	2.5
Oil sector	1	-	1	1	1	1	1	1	1	1	1	-2.1
Pemex Exploración y Producción	-	-	-	-	-	-	-	-	-	-	-	-
Pemex Refinación	-	-	-	-	-	-	-	-	-	-	-	-
Pemex Gas y Petroquímica Básica	1	-	1	1	1	1	1	1	1	1	1	-2.1
Pemex Petroquímica	-	-	-	-	-	-	-	-	-	-	-	-
Pemex Corporativo	-	-	-	-	-	-	-	-	-	-	-	-
Oil sector gas lift	-	-	-	-	-	-	-	-	-	-	-	-
Industrial sector	27	24	25	25	25	26	27	28	28	29	29	1.0
Electricity sector	362	368	366	440	457	482	494	489	485	463	466	2.5
Public	226	231	225	299	313	336	347	343	339	317	320	3.5
Comisión Federal de Electricidad	109	108	102	95	94	95	95	89	93	88	92	-1.6
Luz y Fuerza del Centro	-	-	-	-	-	-	-	-	-	-	-	-
Independent Power Producers	117	123	123	204	219	241	252	253	246	229	227	6.9
Private	137	137	141	141	144	146	146	146	146	146	146	0.7
Self-generation of electricity	1	1	6	6	9	11	11	11	11	11	11	24.7
Electricity export	135	135	135	135	135	135	135	135	135	135	135	0.0
Residential sector	1	2	2	2	2	2	2	2	2	3	3	6.6
Services sector	0	0	0	0	0	0	0	0	0	0	0	4.2
Vehicle transportation sector	-	-	-	-	-	-	-	-	-	-	-	-
Export	-	-	68	158	180	161	149	151	153	153	142	n.a.
Export by private entities	-	-	68	158	180	161	149	151	153	153	142	n.a.
To other regions	-	-	-	-	-	-	-	-	-	-	-	-
Inventories variation and differences*	1	-	-	-	-	-	-	-	-	-	-	-

* Includes differences and packing.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.

1.6.2 Northeastern Region

Between 2006 and 2016, the Northeastern region is expected to have a dynamic with two aspects. The first is related to foreign trade, since a shift in net imports is expected. Between 2006 and 2008, the region will be an importer in net terms. Afterwards, between 2009 and 2012, foreign trade balance will become positive, though in the first year of this period the Altamira Terminal will reach LNG imports of 500 MMcfd. In this period, PGPB is

expected to export a maximum historical volume of 1,240 MMcfd in 2011 through the NGS interconnections of Reynosa. Finally, the net import balance would reappear between 2013 and 2016.

The second aspect observed in the region is the production growth expected by 2016, registering an increase of 515 mmcpd between 2006 and 2016. This expectation is based on the impact of FPWC in the Burgos basin, as well as the investments made by PGPB in the gas processing centers, Burgos and Reynosa, significantly increasing supply in the region that, together with the gas arriving from the South-Southeastern region, will boost the dynamics of foreign trade (see chart 18).

Chart 18
Natural gas balance of the Northeastern Region, 2006-2016
(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr 2016	2006- 2016
Origin	2,069	2,211	2,716	2,849	2,919	3,360	3,346	3,069	2,841	2,769	2,777	3.0	
Regional production	1,442	1,413	1,577	1,691	1,833	1,982	2,097	1,990	1,961	1,948	1,957	3.1	
Gas from PEP for operation ¹	35	35	35	37	40	45	53	60	66	71	78	8.2	
Gas from PEP for recirculations	47	53	61	77	85	87	87	85	82	79	76	5.0	
Gas from PEP directly to Refining	2	1	-	-	4	12	11	8	5	2	-	n.a.	
Production of PGPB plants	829	981	993	1,046	1,080	1,216	1,306	1,182	1,105	1,065	1,072	2.6	
Directly from fields	528	341	479	530	624	623	641	655	703	730	731	3.3	
Ethane injected into pipelines	0	0	9	-	-	-	-	-	-	-	-	n.a.	
Other currents	1	-	-	-	-	-	-	-	-	-	-	n.a.	
Import	626	798	858	868	860	893	885	879	844	820	820	2.7	
Import for logistic purposes	380	448	388	368	360	393	385	379	344	320	320	-1.7	
Import by PGPB for balance purposes	167	11	-	-	-	-	-	-	-	-	-	n.a.	
Import of liquefied natural gas	79	340	470	500	500	500	500	500	500	500	500	n.a.	
From other regions	-	-	281	290	226	485	364	200	36	-	-	n.a.	
Destination	2,059	2,211	2,716	2,849	2,919	3,360	3,346	3,069	2,841	2,769	2,777	3.0	
Regional demand	1,718	1,892	1,872	1,935	2,001	2,119	2,217	2,193	2,128	2,138	2,171	2.4	
Oil sector	168	178	199	228	239	250	259	254	265	266	271	4.9	
Pemex Exploración y Producción	41	42	41	44	47	53	61	66	72	77	84	7.6	
Pemex Refinación	105	111	120	144	149	156	155	152	149	146	145	3.3	
Pemex Gas y Petroquímica Básica	23	25	39	41	43	41	43	36	44	42	43	6.3	
Pemex Petroquímica	-	-	-	-	-	-	-	-	-	-	-	-	
Pemex Corporativo	-	-	-	-	-	-	-	-	-	-	-	-	
Oil sector gas lift ²	47	53	61	77	85	87	87	85	82	79	76	5.0	
Industrial sector	371	348	362	375	400	409	420	430	439	448	460	2.2	
Electricity sector	1,058	1,233	1,163	1,161	1,179	1,270	1,343	1,311	1,226	1,226	1,239	1.6	
Public	915	1,058	986	984	1,002	1,093	1,166	1,134	1,049	1,049	1,062	1.5	
Comisión Federal de Electricidad	284	303	318	266	225	244	250	214	171	158	145	-6.5	
Luz y Fuerza del Centro	-	-	-	-	-	-	-	-	-	-	-	-	
Independent Power Producers	631	755	668	717	777	849	916	920	878	891	917	3.8	
Private	143	175	177	177	177	177	177	177	177	177	177	2.2	
Self-generation of electricity	143	175	177	177	177	177	177	177	177	177	177	2.2	
Electricity export	-	-	-	-	-	-	-	-	-	-	-	-	
Residential sector	57	62	66	71	74	77	80	83	86	88	90	4.6	
Services sector	16	17	18	19	20	21	22	23	24	24	25	4.4	
Vehicle transportation sector	0	1	3	4	5	5	5	6	7	7	8	48.3	
Export	33	280	845	914	918	1,240	1,129	876	713	478	430	29.4	
PGPB export	33	280	845	914	918	1,240	1,129	876	713	478	430	29.4	
To other regions	309	39	-	-	-	-	-	-	-	153	177	n.a.	
Inventories variation and differences*	9	-	-	-	-	-	-	-	-	-	-	n.a.	

n.a.: does not apply.

¹ For balance purposes, the mixture of gas provided for in this item is considered equivalent to dry gas.

² This volume will not be consumed, only recirculated to producing wells.

* Includes differences and packing.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.

1.6.3 Central-Western Region

In this region, natural gas consumption will rise 9.9% per year, increasing from 565 MMcfd in 2006 to 1,451 MMcfd by 2016. The dynamics of regional supply will be divided into two stages. Between 2006 and 2010, gas arriving from the South-Southeastern region will cover the entire consumer sector demand. Later on, with the start of operations of the terminal in Manzanillo in 2011, large part of the consumption of the electricity sector

will be satisfied through LNG imports, and PGPB will continue carrying gas to other regions to satisfy the rest of consumers, even the electricity sector.

The Central-Western region will experience a significant demand increase of approximately 886 MMcfd by 2016. Though the intense activity expected in the electricity sector represents 786 MMcfd of the volume to be increased, an important growth of residential sector consumption is expected in this region, reaching in 2016 figures more than five times those of 2006 (see chart 19).

Chart 19
Natural gas balance of the Central-Western Region, 2006-2016
(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr 2006-2016
Origin	565	670	717	701	700	813	916	1,079	1,350	1,438	1,451	9.9
Regional production	-	-	-	-	-	-	-	-	-	-	-	-
Import	-	-	-	-	-	375	500	500	500	500	500	n.a.
Import for logistic purposes	-	-	-	-	-	-	-	-	-	-	-	-
Imports by PGPB for balance purposes	-	-	-	-	-	-	-	-	-	-	-	-
Import of liquefied natural gas	-	-	-	-	-	375	500	500	500	500	500	n.a.
From other regions	565	670	717	701	700	438	416	579	850	938	951	5.3
Destination	565	670	717	701	700	813	916	1,079	1,350	1,438	1,451	9.9
Regional demand	565	670	717	701	700	813	916	1,079	1,350	1,438	1,451	9.9
Oil sector	69	70	49	54	54	54	54	54	59	59	59	-1.5
Pemex Exploración y Producción	-	-	-	-	-	-	-	-	-	-	-	-
Pemex Refinación	69	69	48	53	52	52	52	52	57	57	57	-1.9
Pemex Gas y Petroquímica Básica	-	0	1	2	2	2	2	2	2	2	2	n.a.
Pemex Petroquímica	-	-	-	-	-	-	-	-	-	-	-	-
Pemex Corporativo	-	-	-	-	-	-	-	-	-	-	-	-
Oil sector gas lift	-	-	-	-	-	-	-	-	-	-	-	-
Industrial sector	288	294	300	308	317	325	334	343	350	356	366	2.4
Electricity sector	201	298	356	325	312	413	504	655	910	989	987	17.3
Public	174	268	327	296	283	384	474	626	880	959	958	18.6
Comisión Federal de Electricidad	95	110	130	54	56	132	229	337	435	464	460	17.1
Luz y Fuerza del Centro	-	-	-	-	-	-	-	-	-	-	-	-
Independent Power Producers	80	158	197	242	227	251	245	289	445	495	498	20.1
Private	26	29	29	29	29	29	29	29	29	29	29	1.1
Electricity self-generation	26	29	29	29	29	29	29	29	29	29	29	1.1
Electricity export	-	-	-	-	-	-	-	-	-	-	-	-
Residential sector	5	7	9	12	14	17	20	23	26	30	33	19.8
Services sector	2	2	2	2	3	3	4	4	5	5	6	10.0
Vehicle transportation sector	-	-	-	-	-	-	-	-	-	-	-	n.a.
Export	-	-	-	-	-	-	-	-	-	-	-	-
To other regions	-	-	-	-	-	-	-	-	-	-	-	-
Inventories variation and differences*	0	-	-	-	-	-	-	-	-	-	-	n.a.

n.a.: does not apply.

* Includes differences and packing.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.

1.6.4 Central Region

Demand in this region will represent 12.6% of the domestic demand in 2016, implying a growth of 491 MMcfd with respect to consumption in 2006. CFE will require 54.5% of the regional demand, mainly from the planned revamping of units in Tula and the State of Mexico.

With the development of the region during the next decade, particularly in the distribution zone of Valle Cuatitlán-Textcoco-Hidalgo, two distribution plants will operate at the same time, reaching maturity by the end of the projected period in sectors such as residential, services and vehicle transport, consuming a total of 67 MMcfd in 2016. The entire regional demand would be satisfied with gas from the South-Southeastern region (see chart 20).

Chart 20
Natural gas balance of the Central Region, 2006-2016
(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr 2016	2006- 2016
Origin	643	652	650	657	711	766	923	1,059	1,122	1,135	1,134		5.8
Regional production	-	-	-	-	-	-	-	-	-	-	-		-
Import	-	-	-	-	-	-	-	-	-	-	-		-
From other regions	643	652	650	657	711	766	923	1,059	1,122	1,135	1,134		5.8
Destination	643	652	650	657	711	766	923	1,059	1,122	1,135	1,134		5.8
Regional demand	643	652	650	657	711	766	923	1,059	1,122	1,135	1,134		5.8
Oil sector	73	81	79	91	93	93	94	95	96	95	95		2.7
Pemex Exploración y Producción	-	-	-	-	-	-	-	-	-	-	-		-
Pemex Refinación	53	69	69	81	80	80	81	82	83	82	82		4.5
Pemex Gas y Petroquímica Básica	0	1	0	0	3	3	4	3	3	3	3		20.9
Pemex Petroquímica	19	11	9	9	9	9	9	9	9	9	9		-7.0
Pemex Corporativo	0	0	0	0	0	0	0	0	0	0	0		0.8
Oil sector gas lift	-	-	-	-	-	-	-	-	-	-	-		-
Industrial sector	246	249	260	267	273	278	284	295	303	309	316		2.5
Electricity sector	297	292	279	263	305	350	494	614	664	668	655		8.2
Public	275	262	247	231	274	319	463	583	633	637	624		8.5
Comisión Federal de Electricidad	244	233	183	225	268	313	454	577	626	631	618		9.7
Luz y Fuerza del Centro	30	30	65	6	6	6	9	6	7	6	6		-15.1
Independent Power Producers	-	-	-	-	-	-	-	-	-	-	-		n.a.
Private	22	30	32	32	32	32	32	32	32	32	32		3.6
Electricity self-generation	22	30	32	32	32	32	32	32	32	32	32		3.6
Electricity export	-	-	-	-	-	-	-	-	-	-	-		-
Residential sector	20	23	25	28	31	34	37	40	43	46	49		9.2
Services sector	4	3	4	4	5	5	6	7	7	8	9		7.5
Vehicle transportation sector	2	3	4	4	5	6	7	8	8	9	10		17.8
Export	-	-	-	-	-	-	-	-	-	-	-		-
To other regions	-	-	-	-	-	-	-	-	-	-	-		-
Inventories variation and differences*	0	-	-	-	-	-	-	-	-	-	-		n.a.

n.a.: does not apply.

* Includes differences and packing.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.

1.6.5 South-Southeastern Region

This region will remain the primary center of domestic natural gas supply, since almost three quarters (74.4%) of the country's supply will be produced in this region by 2016. An element that characterizes this region is the activity of the oil sector that by 2016 will represent 81.2% of regional consumption.

By being the most important region at a national level regarding supply, one of the features that will remain on the planning horizon is that this is the only region that will continue conveying gas to other regions like the Central, Central-Western and Northeastern regions in the years to come. In fact, as of 2007 the region is expected to dispatch more than 1,000 MMcf of its regional production to other regions, reaching a maximum of 2,007 MMcf in 2014 (see chart 21).

Chart 21
Natural gas balance of the South-Southeastern Region, 2006-2016
(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr 2006-2016
Origin	4,100	4,847	5,181	5,410	5,401	5,405	5,468	5,579	5,740	5,689	5,685	3.3
Regional production	4,100	4,847	5,181	5,410	5,401	5,405	5,468	5,579	5,740	5,689	5,685	3.3
Gas from PEP for operation ¹	435	567	444	420	357	273	271	280	285	283	290	-4.0
Gas from PEP for recirculations	339	553	590	730	804	900	994	1,064	1,106	1,136	1,186	13.3
Gas from PEP directly to Refining	-	-	-	-	-	-	-	-	-	-	-	-
Production of PGPB plants	2,615	2,681	3,026	3,238	3,405	3,552	3,624	3,754	3,861	3,852	3,877	4.0
Directly from fields	624	985	977	873	680	527	476	400	421	362	290	-7.4
Ethane injected into pipelines	87	59	122	127	133	130	87	77	68	57	42	-7.0
Other currents	-	0	22	22	23	22	16	5	-	-	-	n.a.
Import	-	-	-	-	-	-	-	-	-	-	-	-
From other regions	-	-	-	-	-	-	-	-	-	-	-	-
Destination	4,113	4,835	5,181	5,410	5,401	5,405	5,468	5,579	5,740	5,689	5,685	3.3
Regional demand	3,214	3,552	3,533	3,761	3,763	3,716	3,765	3,740	3,733	3,769	3,777	1.6
Oil sector	1,270	1,425	1,358	1,389	1,335	1,279	1,300	1,284	1,310	1,379	1,382	0.8
Pemex Exploración y Producción ²	704	849	782	762	709	632	627	626	618	603	598	-1.6
Pemex Refinación	55	48	61	98	96	96	97	97	97	182	182	12.7
Pemex Gas y Petroquímica Básica	238	235	220	239	255	245	267	252	294	285	293	2.1
Pemex Petroquímica	273	292	295	290	274	305	309	309	300	309	309	1.3
Pemex Corporativo	-	-	-	-	-	-	-	-	-	-	-	-
Oil sector gas lift	1,390	1,501	1,565	1,723	1,769	1,803	1,808	1,791	1,748	1,716	1,684	1.9
Industrial sector	82	82	84	86	93	100	131	133	135	137	140	5.5
Electricity sector	472	543	526	564	567	535	527	533	540	537	571	1.9
Public	469	540	523	561	564	533	524	530	538	535	568	1.9
Comisión Federal de Electricidad	104	90	104	93	97	65	54	71	85	102	133	2.4
Luz y Fuerza del Centro	-	-	-	-	-	-	-	-	-	-	-	-
Independent Power Producers	365	451	419	469	467	468	470	459	453	433	436	1.8
Private	3	3	3	3	3	3	3	3	3	3	3	0.2
Electricity self-generation	3	3	3	3	3	3	3	3	3	3	3	0.2
Electricity export	-	-	-	-	-	-	-	-	-	-	-	-
Residential sector	-	-	-	-	-	-	0	0	0	0	0	n.a.
Services sector	0	-	-	-	-	-	0	0	0	0	0	n.a.
Vehicle transportation sector	-	-	-	-	-	-	-	-	-	-	-	-
Export	-	-	-	-	-	-	-	-	-	-	-	-
To other regions	899	1,283	1,648	1,648	1,637	1,689	1,703	1,839	2,007	1,921	1,908	7.8
Inventories variation and differences*	-12	12	-	-	-	-	-	-	-	-	-	n.a.

n.a.: does not apply.

¹ For balance purposes, the mixture of gas provided for in this item is considered equivalent to dry gas.

² Includes consumption by Compañía de Nitrógeno Cantarell as of 2000.

* Includes differences and packing.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.

1.7 Alternative scenarios

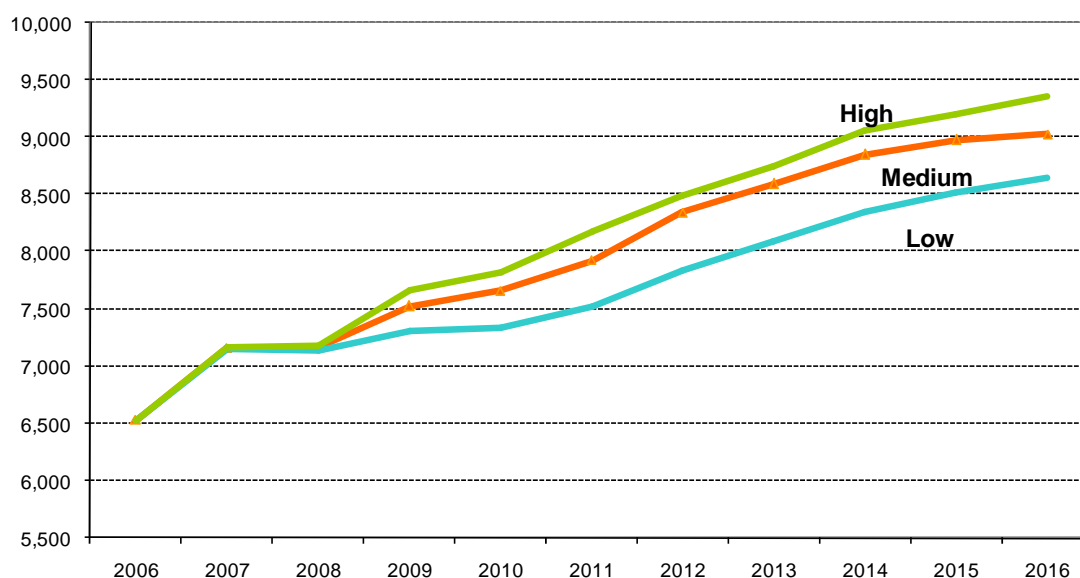
The purpose of elaborating scenarios is not the precise prediction of future events, but the exploration of possible trends, the improvement of the understanding of dynamics that will shape the future and the assessment of strategic operations to prepare decision-making processes. This section introduces the general views giving birth to each natural gas supply and demand scenario for the prospective horizon of 2007-2016, as well as the combinations most likely to occur.

Regarding the domestic supply of dry gas, there is only one so-called medium scenario, implying a series of investments according to the Project portfolio estimated by PEP. The proposed production scenario of PEP originated the medium dry gas supply scenario, considered the most feasible within the investment project

portfolio, since it contemplates the budget restrictions Pemex has to face today. With PEP's accrued investments of 1.45 billion pesos (0.1 billion dollars) in the 2007-2016 period on the proposed scenario, and the investments listed in the section on PGPB investments, the expected average production of dry gas amounts to 7,285 MMcfd.

Natural gas consumption represents the counterpart marking the dynamics of the prospective market. Three expected consumption scenarios are therefore introduced, representing a synthesis of the growth expectations in economic activities in each end-use sector. This phase is characterized by the intervention of all agents determining the balance of natural gas between producers and consumers through the growth expected in the country's economy (see graph 12).

Graph 12
Scenarios of domestic natural gas demand, 2006-2016
(million cubic feet per day)



Source: IMP.

The high demand scenario is based on the expectation that the country's GDP will grow at an annual average rate of 4.1% between 2007 and 2016. This economic growth would create a mean growth rate of 3.7% in domestic market demand for the 2006-2016 period.

The base or medium natural gas demand scenario assumes an annual average growth rate of 3.6% of the economy between 2007 and 2016, reaching a volume of 9,031 MMcfd of natural gas in 2016, through an annual 3.3% demand increase throughout the period, taking 2006 as the base year.

In the low growth scenario projections, natural gas demand would present annual increases of 2.8% for the period of 2006-2016, reflecting a yearly average growth of 2.4% of national economy as of 2007 and until the end of the analyzed period.

High demand - base supply scenario

This alternative scenario proposes the possibility of supply with investment and infrastructure schemes that are among the most feasible today, provided that resources are available in a timely manner. On the one hand, with the authorized projects the growth of supply could continue at an average rate of 3.3% per year. On the other hand, demand would become more dynamic, increasing to 3.7% on the prospective horizon. This scenario causes the gap in imports to reach a maximum of 2,024 MMcf/d in 2012, closing the period with 1,975 MMcf/d in 2016. A variable that could make this scenario feasible is a fall in the prices of natural gas or the continuous high prices of crude oil, increasing the price of petroleum products that substitute natural gas (see chart 22).

Chart 22
Domestic natural gas balance, 2006-2016
High demand – base supply
(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr 2006-2016
Origin	6,561	7,456	8,079	8,627	8,787	9,332	9,589	9,561	9,686	9,605	9,617	3.9
Domestic production	5,543	6,259	6,758	7,100	7,233	7,387	7,565	7,569	7,702	7,638	7,642	3.3
Gas from PEP for operation ¹	470	603	479	457	396	318	324	340	351	354	368	-2.4
Gas from PEP for recirculation	386	607	650	807	888	987	1,081	1,149	1,188	1,216	1,262	12.6
Gas from PEP directly to Refining	2	1	-	-	4	12	11	8	5	2	-	n.a.
Production from PGPB plants	3,445	3,662	4,019	4,284	4,485	4,768	4,929	4,936	4,966	4,917	4,949	3.7
Directly from fields	1,152	1,326	1,456	1,403	1,304	1,150	1,117	1,055	1,124	1,092	1,021	-1.2
Ethane injected into pipelines	87	60	131	127	133	130	87	77	68	57	42	-7.1
Other currents	1	0	22	22	23	22	16	5	-	-	-	n.a.
Import	1,018	1,197	1,321	1,527	1,554	1,945	2,024	1,993	1,984	1,967	1,975	6.8
Import for logistic purposes	773	842	640	562	554	570	524	493	484	467	475	-4.7
Imports by PGPB for balance purposes	167	15	-	-	-	0	-	0	0	0	-	n.a.
Imports of liquefied natural gas	79	340	680	965	1,000	1,375	1,500	1,500	1,500	1,500	1,500	34.3
Destination	6,563	7,445	8,079	8,627	8,787	9,332	9,589	9,561	9,686	9,605	9,617	3.9
Domestic demand	6,531	7,165	7,176	7,662	7,826	8,182	8,494	8,750	9,060	9,204	9,354	3.7
Oil sector	1,581	1,754	1,686	1,763	1,721	1,676	1,708	1,688	1,730	1,799	1,808	1.4
Pemex Exploración y Producción ²	744	891	823	806	756	685	687	692	689	680	682	-0.9
Pemex Refinación	281	298	297	375	377	385	385	383	386	468	466	5.2
Pemex Gas y Petroquímica Básica	263	261	261	282	304	291	316	294	345	333	341	2.6
Pemex Petroquímica	292	303	304	299	283	314	318	318	309	318	318	0.9
Pemex Corporativo	0	0	0	0	0	0	0	0	0	0	0	0.8
Oil sector gas lift	1,436	1,555	1,626	1,800	1,854	1,889	1,894	1,876	1,831	1,795	1,760	2.1
Industrial sector	1,014	1,002	1,040	1,076	1,129	1,164	1,229	1,268	1,301	1,332	1,375	3.1
Electricity sector	2,390	2,733	2,691	2,876	2,963	3,279	3,476	3,717	3,985	4,053	4,173	5.7
Public	2,059	2,360	2,309	2,494	2,578	2,892	3,089	3,330	3,598	3,666	3,786	6.3
Comisión Federal de Electricidad	836	844	837	794	792	1,038	1,198	1,349	1,444	1,490	1,488	5.9
Luz y Fuerza del Centro	30	30	65	17	7	6	9	6	7	6	6	-15.1
Independent Power Producers	1,192	1,487	1,407	1,683	1,779	1,849	1,882	1,976	2,147	2,170	2,292	6.8
Private	331	373	382	382	385	387	387	387	387	387	387	1.6
Electricity self-generation	195	238	246	247	250	252	252	252	252	252	252	2.6
Electricity exports	135	135	135	135	135	135	135	135	135	135	135	0.0
Residential sector	84	94	103	112	122	131	141	151	160	169	178	7.7
Services sector	23	22	24	26	28	31	33	35	38	40	42	6.1
Vehicle transportation sector	2	5	7	8	10	11	13	14	16	17	19	24.9
Export	33	280	903	966	961	1,150	1,095	812	626	400	263	23.2
PGPB exports	33	280	835	814	782	1,002	957	672	477	248	119	13.8
Export by private entities	-	-	68	151	179	148	138	139	150	152	144	n.a.
Inventories variation and differences*	-	2	12	-	-	-	-	-	-	-	-	n.a.

n.a.: does not apply.

¹ For balance purposes, the mixture of gas provided for under this item is considered to be equivalent to dry gas.

² Includes consumption by Compañía de Nitrógeno Cantarell as of 2000.

* Includes differences and packing.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.

Low demand - base supply scenario

This scenario introduces a vision of what would occur if the expectations related to the increase of demand in the long term would become moderate regarding the development of infrastructure, the country's economic activity and the conditions of fuel prices, among others. One cause that could lead to this scenario is fuel use diversification for the generation of electricity, causing a decrease of natural gas consumption within this sector. Another possible factor would be the deployment of programs for the efficient use and saving of energy on this market. In addition, price volatility would also have an important role, since if North American market prices increase considerably, consumers would be forced to decrease their demand (see chart 23)

Chart 23
Domestic natural gas balance, 2006-2016
Low demand – base supply
(million cubic feet per day)

Concept	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	aagr 2006-2016
Origin	6,561	7,451	8,077	8,546	8,703	9,215	9,465	9,635	9,775	9,647	9,630	3.9
Domestic production	5,543	6,259	6,758	7,100	7,233	7,387	7,565	7,569	7,702	7,638	7,642	3.3
Gas from PEP for operation ¹	470	603	479	457	396	318	324	340	351	354	368	-2.4
Gas from PEP for recirculation	386	607	650	807	888	987	1,081	1,149	1,188	1,216	1,262	12.6
Gas from PEP directly to Refining	2	1	-	-	4	12	11	8	5	2	-	n.a.
Production of PGPB plants	3,445	3,662	4,019	4,284	4,485	4,768	4,929	4,936	4,966	4,917	4,949	3.7
Directly from fields	1,152	1,326	1,456	1,403	1,304	1,150	1,117	1,055	1,124	1,092	1,021	-1.2
Ethane injected into pipelines	87	60	131	127	133	130	87	77	68	57	42	-7.1
Other currents	1	0	22	22	23	22	16	5	-	-	-	n.a.
Import	1,018	1,192	1,319	1,445	1,469	1,828	1,901	2,067	2,074	2,010	1,988	6.9
Import for logistic purposes	773	841	639	480	469	552	573	598	574	510	488	-4.5
Imports by PGPB for balance purposes	167	11	-	-	-	-	-	-	-	-	0	n.a.
Imports of liquefied natural gas	79	340	680	965	1,000	1,277	1,328	1,468	1,500	1,500	1,500	34.3
Destination	6,563	7,439	8,077	8,546	8,703	9,215	9,465	9,635	9,775	9,647	9,630	3.9
Domestic demand	6,531	7,149	7,143	7,313	7,334	7,517	7,837	8,091	8,348	8,523	8,642	2.8
Oil sector	1,581	1,754	1,686	1,763	1,721	1,676	1,708	1,688	1,730	1,799	1,808	1.4
Pemex Exploración y Producción ²	744	891	823	806	756	685	687	692	689	680	682	-0.9
Pemex Refinación	281	298	297	375	377	385	385	383	386	468	466	5.2
Pemex Gas y Petroquímica Básica	263	261	261	282	304	291	316	294	345	333	341	2.6
Pemex Petroquímica	292	303	304	299	283	314	318	318	309	318	318	0.9
Pemex Corporativo	0	0	0	0	0	0	0	0	0	0	0	0.8
Oil sector gas lift	1,436	1,555	1,626	1,800	1,854	1,889	1,894	1,876	1,831	1,795	1,760	2.1
Industrial sector	1,014	987	1,008	1,028	1,064	1,081	1,126	1,145	1,157	1,166	1,181	1.5
Electricity sector	2,390	2,733	2,691	2,578	2,541	2,704	2,930	3,192	3,429	3,552	3,672	4.4
Public	2,059	2,360	2,309	2,196	2,156	2,317	2,543	2,805	3,042	3,165	3,285	4.8
Comisión Federal de Electricidad	836	844	837	680	679	699	739	896	1,107	1,283	1,373	5.1
Luz y Fuerza del Centro	30	30	65	6	6	6	7	10	12	6	6	-15.1
Independent Power Producers	1,192	1,487	1,407	1,510	1,471	1,612	1,797	1,898	1,923	1,876	1,906	4.8
Private	331	373	382	382	385	387	387	387	387	387	387	1.6
Electricity self-generation	195	238	246	247	250	252	252	252	252	252	252	2.6
Electricity export	135	135	135	135	135	135	135	135	135	135	135	0.0
Residential sector	84	94	102	111	120	128	137	146	154	161	169	7.2
Services sector	23	22	24	25	27	29	31	32	34	36	37	4.8
Vehicle transportation sector	2	4	6	7	9	10	11	12	13	14	15	22.2
Export	33	290	934	1,233	1,368	1,698	1,628	1,544	1,428	1,124	988	40.6
PGPB export	33	290	866	1,063	1,176	1,536	1,471	1,404	1,290	992	847	38.4
Export by private entities	-	-	68	170	192	162	157	140	137	131	141	n.a.
Inventories variation and differences³	-	2	12	-	-	-	-	-	-	-	-	n.a.

n.a.: does not apply.

¹ For balance purposes, the mixture of gas provided for under this item is considered to be equivalent to dry gas.

² Includes consumption by Compañía de Nitrógeno Cantarell as of 2000.

* Includes differences and packing.

Source: IMP, based on data from CFE, CRE, Pemex, Sener and private companies.