

## COUNTRY ANALYSIS BRIEFS

# Mexico

Last Updated: January 2007

## Background

**Mexico is a major non-OPEC oil producer and home to one of the world's largest oil companies, Pemex.**

Mexico's economy continued to experience strong growth in 2005, with gross domestic product (GDP) increasing by 3.0 percent in 2005, after growing by 4.4 percent in 2004. This growth is a sharp contrast to the earlier part of the decade, when Mexico's GDP growth was very small or negative. A combination of high global oil prices and economic recovery in the United States has driven the economic recovery in Mexico.



The oil sector is a crucial component of Mexico's economy. While its importance to the general Mexican economy has declined, the oil sector still generates over 10 percent of the country's export earnings and one-third of government revenues. Another important part of the Mexican economy is the *maquiladora* sector, consisting of manufacturing plants located near the U.S. border. The *maquiladora* plants import raw materials from the United States, and then re-export the finished products duty free to the U.S. Other key economic sectors include the nonfuel mining sector and the manufacturing of automobiles and machine tools.

In July 2006, Felipe Calderon was elected as Mexico's new president. The results of the election could have an important effect on the country's energy sector, due to the strong state presence in the sector. According to press reports, Calderon has talked of allowing private companies to participate in new upstream energy projects, which could help stem Mexico's declining crude oil production and lessen natural gas imports. In December 2006, Calderon appointed Jesus Reyes Heróles, a former energy minister and ambassador to the United States, as the new head of state oil monopoly Pemex, and Georgina Kessel as Energy Secretary.

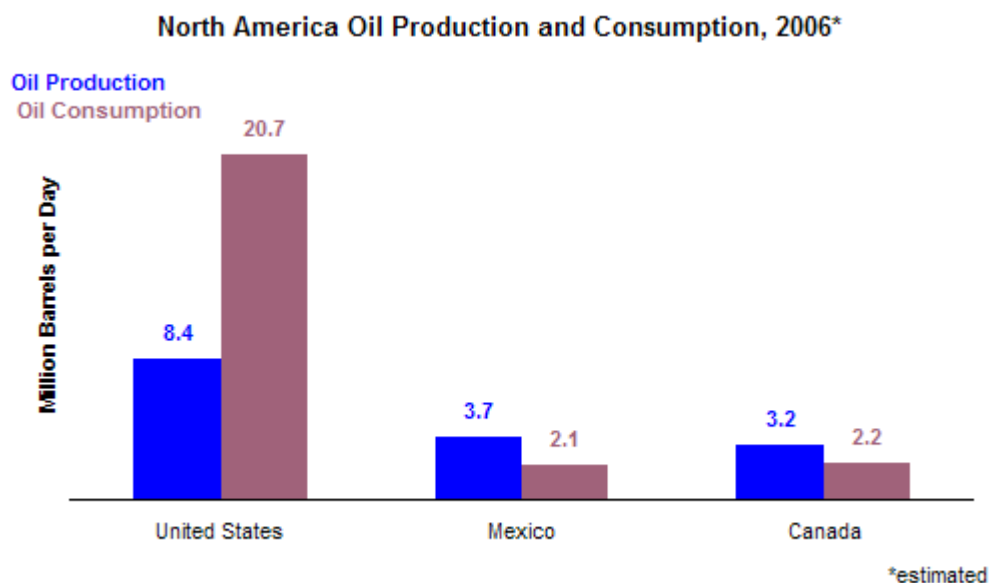
## Oil

**Mexico is one of the top three sources of U.S. oil imports.**

According to the *Oil and Gas Journal* (OGJ), Mexico had 12.9 billion barrels of proven oil reserves as of January 1, 2006, the third-largest amount of conventional crude oil reserves in the Western Hemisphere. Most reserves consist of heavy crude oil varieties, with a specific gravity of less than 25° API. The largest concentration of remaining reserves occurs offshore in the southern part of the country, especially in the Campos Basin.

Mexico is the fifth-largest producer of oil in the world. The country produced an average of 3.74 million barrels per day (bbl/d) of total oil liquids during 2006, a 1.2 percent decline from 2005 and a 2.5 percent decline from 2004. Of Mexico's oil production, about 88 percent was crude oil and condensate, the rest consisting of natural gas liquids (NGL) and refinery gain. Many analysts believe that Mexican oil production has peaked, and that the country's production will continue to

decline in the coming years. EIA forecasts that Mexico will produce 3.6 million bbl/d of oil in 2007, down from 3.8 million bbl/d in 2005 and 3.7 million bbl/d in 2006, mainly driven by declining production at its super-giant Cantarell field (please see below for a more detailed discussion of Cantarell).



Source: EIA Short Term Energy Outlook, Nov. 2006

Mexico's proven reserves have declined in recent years. According to state-owned Pemex, Mexico's reserves/production ratio (based on previous-year production levels) fell from 20 years in 2002 to 10 years in 2006. Analysts believe that Pemex does not have sufficient funds available for exploration and investment to reverse the decline, owing to high financial burdens placed upon the company by the Mexican government.

### Sector Organization

The Mexican constitution provides that the Mexican nation owns all hydrocarbon resources in the country. In 1938, Mexico nationalized its oil sector, creating Petroleos Mexicanos (Pemex) as the sole oil operator in the country. In 1992, Pemex divided into four operating subsidiaries: Exploration and Production, Gas and Basic Petrochemicals, Petrochemicals, and Refining. Pemex is the largest company in Mexico and one of the largest oil and natural gas companies in the world.

Pemex faces a variety of challenges in increasing its oil exploration and production (E&P) activities. First, Pemex has a complicated relationship with Mexico's federal government. Pemex has been a steady source of funds for the government, sending an estimated 60 percent of its revenues to the federal government in 2005. In addition, Mexico's Congress must approve Pemex's budget each year. This has the effect of constraining Pemex's ability to fund additional E&P investments. In the years that Pemex generated above-average revenues, the federal government took a larger stake of these earnings through taxes. Conversely, in years that Pemex generated below-average revenues, Congress cut Pemex's E&P budget to make up for government deficits. Another source of revenue for Pemex is the Proyectos de Impacto Diferido en el Registro del Gasto (PIDIREGAS) scheme, whereby Pemex can finance new infrastructure projects through partnerships with private contractors.

These fiscal imbalances have led to Pemex carrying a high debt load. According to its 2005 financial statements, Pemex held \$46 billion in long-term debt and an additional \$34 billion in liabilities it faces for employee pensions. The mounting debt load could hinder Pemex's access to international capital markets and prohibit increased spending on exploration and production.

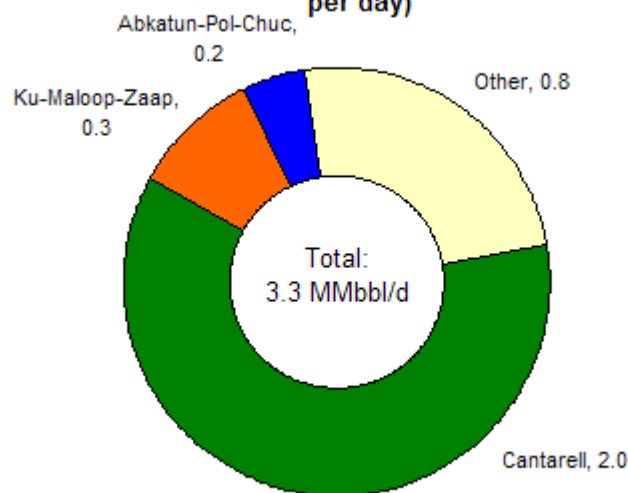
### Exploration and Production

Most of Mexico's oil production occurs in the Gulf of Campeche, located off the south-eastern coast of the country in the Gulf of Mexico. In 2005, this area accounted for 73 percent of Mexico's

total crude oil production. There are other important production centers in onshore basins in the northern and southern parts of the country.

The Cantarell oil field, located in the Gulf of Campeche, is one of the largest oil fields in the world. In 2005, Cantarell produced 2.0 million bbl/d of crude oil, or 60 percent of the national total. The field consists of four major subfields: Akal, Nohoch, Chac, and Kutz. Production at Cantarell began in 1979, but production began to decline due to falling reservoir pressure. In 1997, Pemex developed a plan to reserve the field's decline by injecting nitrogen into the reservoir to maintain pressure. The plan was a great success, with production at Cantarell in 2004 double the level seen in 1995. Other expansion plans at the field should continue to add incremental production increases: Pemex is currently developing the untapped Sihil field, located beneath Cantarell, which contains an estimated 400 million barrels of recoverable reserves.

**Mexico's Crude Oil Production, by Field, 2005 (million barrels per day)**



Source: Pemex

However, Pemex has warned that Cantarell production has now entered a stage of long-term decline. According to Pemex, Cantarell produced 2.14 million bbl/d of crude oil during Jan-Sept 2004, versus 2.06 million bbl/d in 2005 and 1.85 million bbl/d in 2006 during the same period. Cantarell production will likely continue to decline by an estimated 14 percent per year going forward, despite any incremental gains by incorporating additional satellite fields.

The two other major oil production centers in the Gulf of Campeche are Ku-Maloob-Zaap(KMZ) and Abkatun-Pol-Chuc. Located adjacent to Cantarell, the KMZ complex produced 321,700 bbl/d of crude oil in 2005. Production at the field has risen by 50 percent over the past decade, and Pemex hopes that continued development of the field will replace some of the decline in Cantarell production. Off the coast of Tabasco state, the Abkatun-Pol-Chuchfacility produced 299,800 bbl/d of crude oil in 2005. Production there has declined steadily, down over 50 percent from 1996.

Important onshore production centers in the southern part of the country include Bellota-Jujoand Samaria-Luna. There is less crude oil production in the northern part of the country, which produced only 83,500 bbl/d of crude oil production in 2005; the largest field in the north is Poza Rica.

#### *Increasing Investment in Exploration and Production*

In order to offset declining production at Cantarell, Pemex hopes to expand production at the KMZ field complex. By pursuing a nitrogen re-injection program similar to the one used at Cantarell, Pemex hopes to increase production at KMZ to 800,000 bbl/d by 2010. There is some evidence that these expansion plans are already beginning to show returns: according to Pemex, production at KMZ during Jan-Sept 2006 was almost 30 percent higher from the same period a year ago, though some of this increase could be attributed to lower-than-average production in 2005 due to heightened hurricane activity in the Gulf of Mexico. Another source of new crude oil

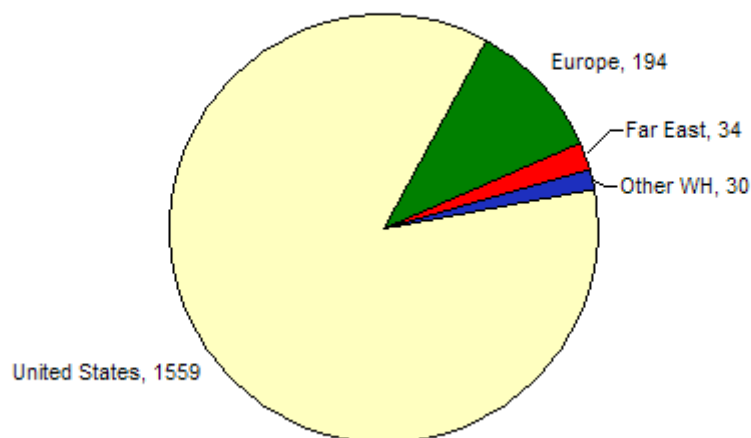
production is Pemex's CrudeoLigero Marino project, which aims to increase offshore production of lighter crude varieties by 250,000 bbl/d by 2010.

Regarding new production assets, Pemex has started development of the onshore Chicontepec project, located northeast of Mexico City. Chicontepec contains an estimated 6.5 billion barrels of probable reserves. As of the end of 2004, Pemex reported that it had drilled 93 exploratory and 1,004 development wells in the area. However, the Chicontepec project is still in the very early stages of development, and there are no solid estimates available as to its full production potential.

#### *Crude Varieties*

Most of Mexico's crude oil production consists of heavy crude varieties. During 2005, 72 percent of the country's crude oil production was of Maya, which averages 22° API and 3.5-4.0 percent sulfur content. The country also produces two lighter crude streams, Isthmus (34° API) and Olmeca (39° API). In general, Mexico retains most of the lighter crude streams for domestic consumption and exports the bulk of its Maya production to the U.S. Gulf Coast, which has the sophisticated refining capacity necessary to process these heavy crudes.

#### **Mexico's Crude Oil Exports, by Destination, 2005**



Source: Pemex; EIA Petroleum Supply Annual 2005

#### *Oil Exports*

In 2005, Mexico exported 1.82 million bbl/d of crude oil. Of this amount, 90 percent went to the United States. Mexico is consistently one of the top three exporters of crude oil to the United States, along with Canada, Saudi Arabia, and Venezuela.

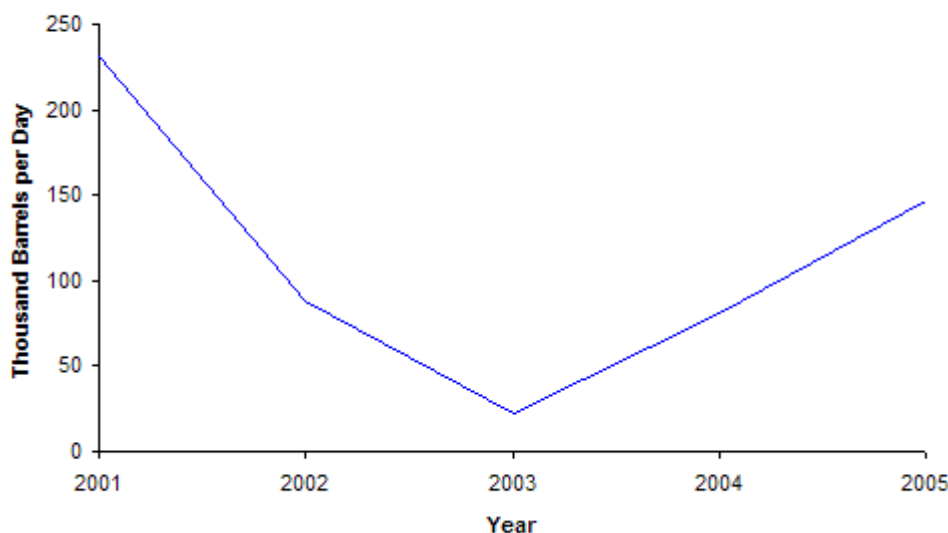
#### *Pipelines*

Pemex operates an extensive pipeline network in Mexico that connects major production centers with domestic refineries and export terminals. This network consists of over 453 pipelines spanning 2,900 miles, with the largest concentration occurring in the southern part of the country.

#### **Downstream**

According to *OGJ*, Mexico has six refineries, all operated by Pemex, with a total refining capacity of 1.68 million bbl/d. The largest facility in the country is the 330,000-bbl/d Salina Cruz facility. Pemex also controls 50 percent of the 334,000-bbl/d Deer Park refinery in Texas.

### Mexico's Net Imports of Refined Petroleum Products



Source: Pemex

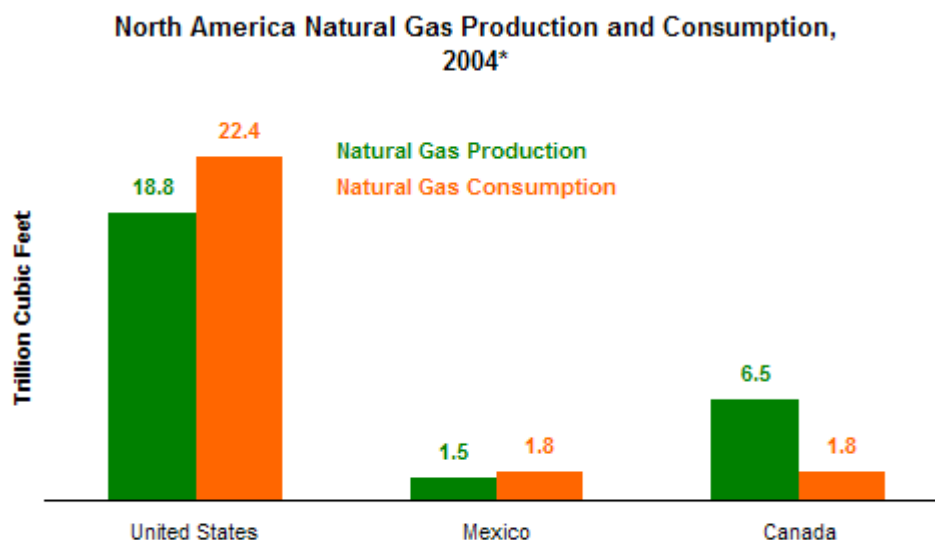
Despite its status as one of the world's largest crude oil exporters, Mexico is a net importer of refined petroleum products. In 2005, Mexico imported 333,700 bbl/d of refined petroleum products, while exporting 187,100 bbl/d. Of these imports, gasoline represented 51 percent. A resumption of brisk economic growth is one cause for the increase in refined product imports. Pemex has stated that it needs to spend at least \$19 billion over the next eight years in order to make up for domestic shortfalls in gasoline production. The company has recently completed a series of refinery upgrades, and additional capacity should become available by 2008.

### Natural Gas

***Mexico has sizable natural gas reserves, but has not fully exploited them due to a lack of investment.***

According to OGJ, Mexico had 16.0 trillion cubic feet (Tcf) of proven natural gas reserves as of January 2006. According to Pemex, the Southern Region of the country contains the largest share of proven reserves. However, the Northern Region will likely be the center of future reserves growth, as it contains almost ten times as many probable and possible natural gas reserves as the Southern Region. According to EIA, Mexico produced 1.46 Tcf of natural gas in 2004, up from 1.40 in 2003. In addition, the country consumed 1.78 Tcf of natural gas in 2004. Preliminary data from Pemex indicates that Mexico produced 1.62 Tcf of natural gas in 2005.

Mexico's natural gas production has grown in recent years, following steady declines during the late 1990s. During that time, natural gas consumption has grown steadily, driven mostly by the electricity sector, whose share of total natural gas consumption increased from 16 percent in 1994 to 33 percent in 2004. On the other hand, Pemex itself is the single largest consumer of natural gas, representing 43 percent of domestic consumption in 2004. As a result of the domestic shortfall in natural gas production, Mexico imported 766 million cubic feet per day (MMcf/d) of natural gas in 2004 and 480 MMcf/d in 2005.



Source: EIA International Energy Annual 2004

### Sector Organization

State-owned Pemex holds a monopoly on natural gas exploration and production in Mexico. However, there is some private participation in ancillary services that support Pemex operations. The Mexican government opened the downstream natural gas sector to private operators in 1995, though no single company may participate in more than one industry function (transportation, storage, or distribution). It also created the Energy Regulatory Commission (CRE) to monitor the sector. CRE has awarded permits for natural gas distribution to Gas Natural, Tractebel, Gaz de France, Sempra Energy, Kinder Morgan, TXU Energy, Grupo Diavaz, and Grupo Imperial.

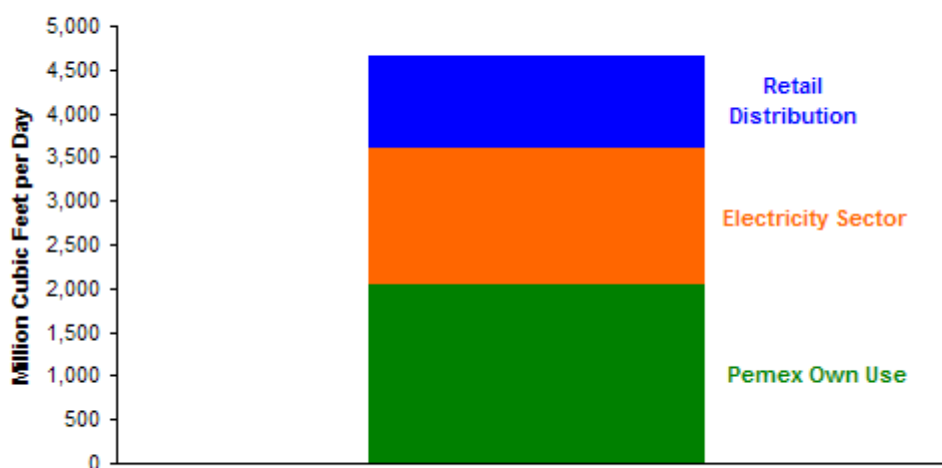
#### *Participation by Private Operators in the Upstream Sector*

Mexico's constitution restricts private operators in the upstream natural gas sector. However, Pemex introduced multiple service contracts (MSC) in an attempt to increase non-associated natural gas production. Under an MSC, Pemex can hire a private contractor (including both foreign and domestic firms) to conduct production activities in proven reserve areas, for which Pemex pays cash for these services. At no time do these private operators gain ownership rights over the natural gas they produce, a provision to ensure compatibility of the MSC with Mexico's constitution.

Despite the misgivings of some Mexican politicians, who questioned the legality of MSCs, Pemex launched the first MSC bidding round in July 2003. The company awarded five blocks in the Burgos Basin to international and domestic operators: Repsol-YPF (Spain) received the Reynosa-Monterrey block; Petrobras (Brazil), Teikoku Oil (Japan), and Grupo Diavaz (Mexico) received the Cuervito and Fronterizo blocks; Tecpetrol (Argentina), Industrial Perforadora de Campeche (Mexico) received the Mision block; and Lewis Energy (U.S.) received the Olmos block. Pemex hoped that the five deals would bring \$4.5 billion in new investment to the Burgos Basin.

Pemex held a second MSC bidding round in July 2004. The round included acreage in the Burgos Basin that did not receive bids in the first round (Padera-Anahuac and Ricos blocks) and newly available areas of the Sabinas Basin (Pirineo and Monclova blocks). Results from the round were mixed. Pemex awarded the Padera-Anahuac block to consortium of two Mexican oil services companies in November 2004 and the Pirineo block to a consortium of seven Latin American firms in February 2005. However, the Ricos block received no bids, while Pemex later cancelled a successful bid on the Monclova block by a consortium of two U.S. and three Mexican companies.

### Mexico's Natural Gas Consumption, by End Use, 2005



Source: Pemex

The MSCs seem to be a step towards the gradual opening of Mexico's upstream natural gas sector. Pemex hopes that private investment in the MSC blocks will eventually increase the country's natural gas production by 600 MMcf/d. However, this increased production will not fully mitigate increasing natural gas consumption, meaning that Mexico will depend upon increased production by Pemex or imports for the foreseeable future.

#### Exploration and Production

Mexico's natural gas production is relatively spread throughout the country. Onshore fields in the northern part of the country represented 38 percent of Mexico's natural gas production in 2005, with onshore fields in the south contributing 29 percent, and offshore fields in the Gulf of Campeche represented the remainder. The single largest field is Cantarell, in the Gulf of Campeche, which produced 720 MMcf/d in 2005. Other major fields include Caan (206 MMcf/d), Culebra (172 MMcf/d), and Muspac (115 MMcf/d).

#### Pipelines and Storage

Pemex operates over 5,700 miles of natural gas pipelines in Mexico. The company has eleven natural gas processing centers, which produced 436,000 bbl/d of natural gas liquids (NGLs, including condensates) and 215,000 bbl/d of liquefied petroleum gas (LPG) in 2005. Pemex also operates most of the country's natural gas distribution network, which supplies processed natural gas to consumption centers. The natural gas pipeline network includes twelve active connections with the United States.

TransCanada won a contract in June 2005 from Mexico's Comision Federal de Electricidad (CFE) to build, own, and operate the 80-mile Tamazunchale Pipeline. The system will extend from the Pemex natural gas processing facility in Naranjos to a gas-fired power plant near Tamazunchale. The pipeline will have an initial capacity of 170 MMcf/d, but the contract has an option to increase capacity to 430 MMcf/d, if CFE constructs additional gas-fired power plants in the area. TransCanada planned to bring the project online by the end of December 2006. In July 2006, CRE awarded a permit to U.S.-based Tidelands for the construction of the 1-Bcf/d Terranova Oriente bi-direction pipeline, which would connect a proposed storage facility to the U.S. and Mexican grids.

#### Liquefied Natural Gas (LNG)

There is a single operating LNG terminal in Mexico, and one other currently under construction. In addition, there are several more plants in various stages of the planning process. Many of the facilitates are near the U.S.-Mexico border in Baja California, with the intention to supply markets in both countries.

#### East Coast

Altamira, a joint venture of Royal Dutch Shell (50 percent), Total (25 percent), and Mitsui (25 percent) received its first LNG cargo in August 2006. The plant, located in Tamaulipas state, has an initial capacity of 500 MMcf/d, with plans to increase the project to a peak capacity of 1.3 Bcf/d. CFE has signed a 15-year contract to purchase the entire output of the terminal for 15 years. Shell plans to supply the Altamira terminal with LNG from Nigeria.

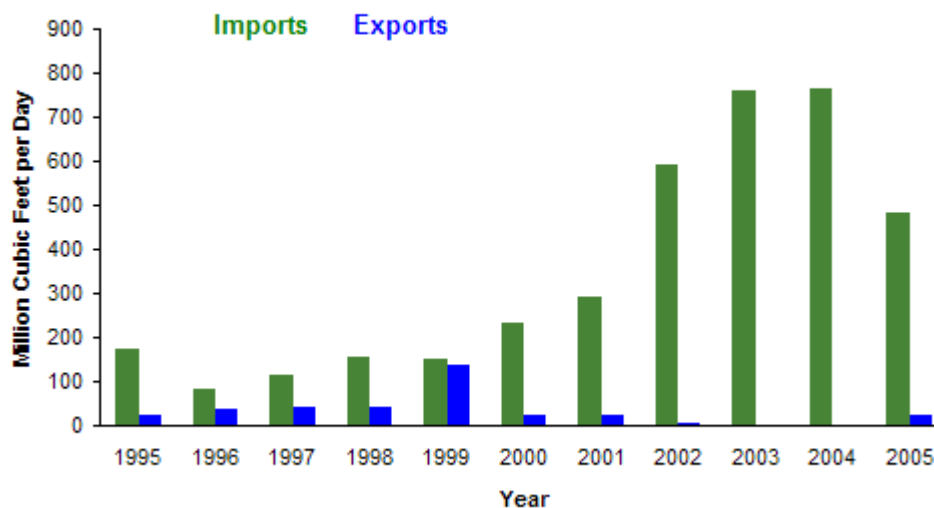
#### *West Coast*

The Costa Azul project, near Ensenada, is currently under construction. Project leader Sempra Energy plans to begin operations in late 2008, with a peak capacity of 1 Bcf/d. Royal Dutch Shell had originally obtained a permit to build its own LNG receiving terminal in the area, but later decided to buy into a 50 percent share of Sempra's project instead. During the first several years of operations, Shell plans to source its LNG supply from its Sakhalin-II project, then later from Chevron's Gorgon LNG project in Australia (see the [Sakhalin Fact Sheet](#) and [Australia Country Analysis Brief](#) for more information). For its part, Sempra Energy has signed a supply deal with BP's Tangguh project in Indonesia (see [Indonesia Country Analysis Brief](#) for more information). Most of the natural gas will supply domestic customers in northwest Mexico, but some natural gas could also be exported to California or Arizona.

Chevron plans to build an offshore LNG receiving terminal near the Coronado Islands. The plant will have an initial capacity of 700 MMcf/d, later growing to 1.4 Bcf/d. Mexico's federal government has approved the project, but Chevron must still obtain permission from local regulators. There has been some opposition to the project from local residents and environmental activists from both Mexico and the United States. Chevron could supply the project from its Gorgon LNG export terminal in Australia.

In February 2004, Repsol-YPF won a concession to build an LNG receiving terminal in Lazaro Cardenas, Michoacan state. According to Repsol-YPF, the plant should come online in 2007 with an initial capacity of 390 MMcf/d, eventually ramping up to 1.0 Bcf/d. Tractebel LNG, a subsidiary of Suez, also has plans to build an LNG terminal at Lazaro Cardenas. The company has begun the preliminary development of the project, with startup slated for 2009. In 2003, Tractebel LNG signed an MOU with Peru LNG to supply the terminal (see the [Peru Country Analysis Brief](#) for more information).

#### Mexico's Natural Gas Trade



Source: Pemex

In May 2004, DKRW signed an agreement with the state government of Sonora to build a 1.3-Bcf/d LNG receiving terminal at Puerto Libertad, on the Gulf of California. DKRW purchased land for the project in August 2004, and the plant could begin operations by 2009. The company has signed an agreement with El Paso to develop a pipeline system to distribute the natural gas within Sonora and to the United States.



In June 2006, CFE released the first public tenders for the construction of an LNG receiving terminal at the port of Manzanillo. The tender calls for the terminal to supply 500 MMcf/d of natural gas for 15 years, possibly expanding to 1.5 Bcf/d. CFE has targeted 2011 for the commencement of the plant's operations.

## Coal

**Mexico imports coal from the United States, Canada, Colombia, and Australia.**

Mexico had 1.3 billion short tons (Bst) of recoverable coal reserves in 2004. The majority of the coal reserves are in the state of Coahuila, in the northeastern part of the country. Mexico produced 12.5 million short tons (MMst) in 2004, while consuming 17.5 MMst. Imports come from the United States, Canada, Colombia, and Australia. Most coal consumption is for electricity generation, followed by steel-making. According to the Mexican government, the contribution of coal-fired power plants to the country's electricity generation was 23 percent in 2005.

## Electricity

**Mexico generates most of its electric power from fuel oil.**

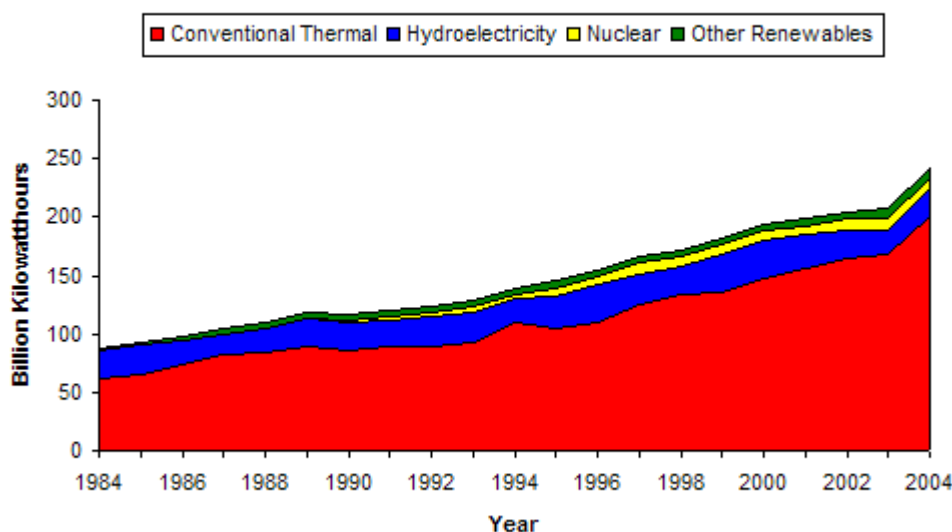
Mexico had 49.6 gigawatts of installed electricity generating capacity in 2004. The country generated 242.4 billion kilowatt-hours (Bkwh) of electric power in 2004. Of the total generated, 82 percent came from conventional thermal sources, 10 percent came from hydroelectricity, 4 percent came from nuclear power, and 4 percent came from other renewables. Mexico's Energy Secretariat (Sener) forecasted that Mexico will need to spend \$51 billion over the next decade to meet growing demand for electricity, entailing the construction of 28 gigawatts of additional generating capacity.

Mexico consumed 224.6 Bkwh of electric power in 2004. Demand for electric power has increased steadily over the last decade, and Sener forecasts that demand will grow by 6 percent a year for the next ten years. The regions that will see the largest increase are the Northeast, Baja California, and the Yucatan Peninsula, mainly due to growth in manufacturing and tourism.

## Sector Organization

State-owned Comision Federal de Electricidad (CFE) is the dominant player in the generation sector, controlling about two-thirds of installed generating capacity. CFE also holds a monopoly on electricity transmission and distribution outside of Mexico City and some other municipalities; within those areas, state-owned Luz y Fuerza Centro (LFC) holds a monopoly on distribution activities. The Comision Reguladora de Energia (CRE) has principle regulatory oversight of the electricity sector.

**Mexico's Electricity Generation, by Source**



Source: EIA International Energy Annual 2004

Changes to Mexican law in 1992 opened the generation sector to private participation. Any company seeking to establish private electricity generating capacity or begin importing/exporting electric power must attain a permit from CRE; according to CRE, independent power producers (IPPs) control 9.3 gigawatts of generating capacity in the country. CFE also operates Mexico's

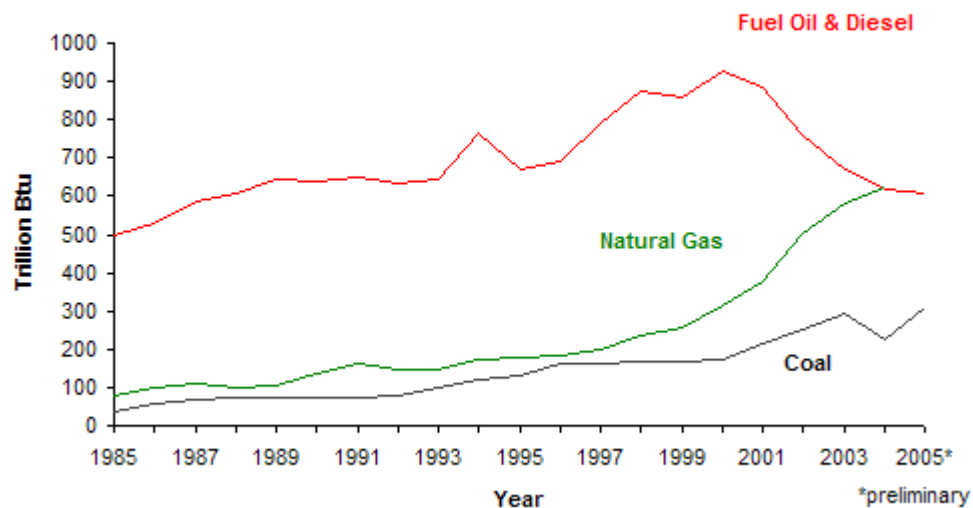
national transmission grid, which consists of 27,000 miles of high voltage lines, 28,000 miles of medium voltage lines, and 370,000 miles of low voltage distribution lines.

### Conventional Thermal

In the national electricity system (excluding private generators), fuel oil is the dominant feedstock for conventional thermal electricity generation, followed by coal: in 2004, Sener reported that fuel oil represented 44 percent of the thermal feedstock for the country's conventional thermal generation capacity, while natural gas represented 33 percent and coal represented 12 percent. However, nearly all private generators operate capacity fired by natural gas. As a result, the general trend in overall feedstock consumption has seen a decline in petroleum-based fuels and a growth in natural gas and coal.

Mexico will need to bring additional generating capacity online over the next several years, in order to meet projected increases in demand. Natural gas-fired turbines will likely supply most of this capacity. In 2003, Union Fenosa, Sempra Energy, Transalta, and InterGen all commissioned new power plants, representing over 3,000 megawatts (MW) of generating capacity. In 2004, Iberdrola completed its gas-fired Altimira III and IV plants, with combined capacity of 1,040 MW; the company also completed Altamira V (1,200 MW) in October 2006. According to CRE, companies in Mexico plan to bring 1,600 MW of new generating capacity online in 2007, which includes independent power producers (Iberdrola's 1,100-MW Tamazunchale), autoproducers (440 MW), and cogeneration (85 MW). In 2008, Generadora del Desierto plans to complete construction of a 600-MW, combined-cycle, gas-fired plant that will export power to the United States.

### Consumption of Hydrocarbons For Electricity Generation in Mexico



Source: Sener Balance Nacional de Energia

### Other Sources

Mexico has a single nuclear power plant, the 1,400-MW Laguna Verde nuclear reactor in Veracruz, operated by CFE. In January 2007, CFE planned to issue a \$300 million tender to increase the generating capacity of Laguna Verde by 20 percent. In November 2006, Mexico's Energy Ministry recommended that the country build a second nuclear power plant in the country, which could help diversify the country's electricity mix away from oil and natural gas.

Hydroelectricity supplied 10 percent of Mexico's electricity generation in 2004. The largest plant in the country is the 2,400-MW Manuel Moreno Torres in Chiapas. Mexican engineering firm ICA is nearing completion of the 750-MW El Cajon hydroelectric dam in Nayarit; CFE began initial testing of the facility in November 2006.

CFE operates two wind power facilities, La Venta and Guerrero Negro, with combined capacity of 3 MW. In August 2005, CFE awarded a contract to a Spanish consortium of Iberdrola and

Gamesa Eolica to increase the capacity of the La Venta facility by 80 MW. Mexico also has 960 MW of geothermal capacity spread amongst seven plants. The Cerro Prieto complex consists of four plants, with a combined capacity of 720 MW.

### International Trade

Mexico has an active electricity trade with the United States. Mexico exported 1,600 megawatt-hours (MWh) of electricity to the United States in 2005, while importing 470 MWh. Many companies have build power plants near the U.S.-Mexico border with the aim of exporting all generation to the United States. CRE has issued permits for private companies to build up to 2,200 MW of generation capacity dedicated to export to the U.S. market, the largest of which is Sempra Energy's 700 MW plant near Mexicali.

There are plans to connect Mexico with Guatemala and Belize as part of the Sistema de Interconexion Electrica para America Central (SIEPAC). The plan is part of a larger effort, the [Plan Puebla-Panama](#), to create an integrated electric power market in Central America (please see the Central America Regional Factsheet for more information).

## Environment

***Air pollution is the most serious environmental problem in Mexico.***

The Mexican Health Secretariat says that more than a third of Mexico's disease burden is the result of environmental factors, the most serious of which is air pollution. Though especially pressing in the country's largest cities (e.g. Mexico City, Guadalajara, and Ciudad Juarez), air pollution also has intensified along the border with the United States, because of the growing number of factories located there and increased truck traffic. Mexico City has the worst air pollution in the country and ranks among the most polluted cities in the world.

## Profile

### Country Overview

<b>Chief of State</b>	Felipe Calderon (since December 2006)
<b>Location</b>	Middle America, bordering the Caribbean Sea and the Gulf of Mexico, between Belize and the US and bordering the North Pacific Ocean, between Guatemala and the US
<b>Independence</b>	16 September 1810 (from Spain)
<b>Population (2006E)</b>	107,449,525

### Economic Overview

<b>Currency/Exchange Rate (December 7, 2006)</b>	1 Mexican Peso (MXN) = \$0.092
<b>Inflation Rate (2004E, 2005E)</b>	4.7%, 4.0%
<b>Gross Domestic Product (GDP, 2005E)</b>	\$769 billion
<b>Real GDP Growth Rate (2004E, 2005E)</b>	4.4%, 3.0%
<b>Unemployment Rate (2005E)</b>	3.6%
<b>External Debt (2005E)</b>	\$137 billion
<b>Exports (2005E)</b>	\$214 billion
<b>Exports - Commodities</b>	manufactured goods, oil and oil products, silver, fruits, vegetables, coffee, cotton
<b>Exports - Partners (2005E)</b>	US 85.7%, Canada 2%, Spain 1.4%
<b>Imports (2005E)</b>	\$222 billion
<b>Imports - Commodities</b>	metalworking machines, steel mill products, agricultural machinery, electrical equipment, car parts for assembly, repair parts for motor vehicles, aircraft, and aircraft parts
<b>Imports - Partners (2005E)</b>	US 53.4%, China 8%, Japan 5.9%
<b>Current Account Balance (2005E)</b>	-\$2 billion

## Energy Overview

<b>Proven Oil Reserves (January 1, 2006E)</b>	12.9 billion barrels
<b>Oil Production (2006E)</b>	3,746 thousand barrels per day, of which 88% was crude oil.
<b>Oil Consumption (2006E)</b>	2,075 thousand barrels per day
<b>Crude Oil Distillation Capacity (2006E)</b>	1,684 thousand barrels per day
<b>Proven Natural Gas Reserves (January 1, 2006E)</b>	16 trillion cubic feet
<b>Natural Gas Production (2004E)</b>	1.5 trillion cubic feet
<b>Natural Gas Consumption (2004E)</b>	1,781.8 billion cubic feet
<b>Recoverable Coal Reserves (2003E)</b>	1,334.9 million short tons
<b>Coal Production (2004E)</b>	12.5 million short tons
<b>Coal Consumption (2004E)</b>	17.5 million short tons
<b>Electricity Installed Capacity (2004E)</b>	49.6 gigawatts
<b>Electricity Production (2004E)</b>	242.4 billion kilowatt hours
<b>Electricity Consumption (2004E)</b>	224.6 billion kilowatt hours
<b>Total Energy Consumption (2004E)</b>	6.6 quadrillion Btus*, of which Oil (58%), Natural Gas (29%), Coal (5%), Hydroelectricity (4%), Other Renewables (2%), Nuclear (1%)
<b>Total Per Capita Energy Consumption (2004E)</b>	63.0 million Btus
<b>Energy Intensity (2004E)</b>	6,489.2 Btu per \$2000-PPP**

## Environmental Overview

<b>Energy-Related Carbon Dioxide Emissions (2004E)</b>	385.5 million metric tons, of which Oil (66%), Natural Gas (27%), Coal (8%)
<b>Per-Capita, Energy-Related Carbon Dioxide Emissions (2004E)</b>	3.7 metric tons
<b>Carbon Dioxide Intensity (2004E)</b>	0.4 Metric tons per thousand \$2000-PPP**
<b>Environmental Issues</b>	scarcity of hazardous waste disposal facilities; rural to urban migration; natural fresh water resources scarce and polluted in north, inaccessible and poor quality in center and extreme southeast; raw sewage and industrial effluents polluting rivers in urban areas; deforestation; widespread erosion; desertification; deteriorating agricultural lands; serious air and water pollution in the national capital and urban centers along US-Mexico border; land subsidence in Valley of Mexico caused by groundwater depletion note: the government considers the lack of clean water and deforestation national security issues
<b>Major Environmental Agreements</b>	party to: Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling signed, but not ratified: none of the selected agreements

## Oil and Gas Industry

<b>Organization</b>	Petroleos Mexicanos (Pemex), state-owned oil and natural gas monopoly
<b>Major Oil/Gas Ports</b>	Cayo Arcos, Dos Bocas, Pajaritos, Tuxpan, Ciudad Madero, Salina Cruz, Rosarito

<b>Foreign Company Involvement</b>	Some service contracts.
<b>Major Oil Fields</b>	Cantarell, Ku-Malooop Zaap, Abkatun-Pol-Chuc
<b>Major Natural Gas Fields</b>	Cantarell, Caan, Culebra, Muspac
<b>Major Refineries (capacity, bbl/d)</b>	Salina Cruz (330,000), Ciudad Madero (320,000), Tula Hidalgo (320,000), Cadereyta (275,000), Salamanca (245,000), Minatitlan (194,000)

\* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

\*\*GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

## Links

### EIA Links

[EIA - Country Information on Mexico](#)

### U.S. Government

[CIA World Factbook - Mexico](#)

[U.S. Department of Energy, Bilateral Energy Agreements with Mexico](#)

[U.S. Department of Energy, U.S. Electricity Trade](#)

[U.S. State Department's Consular Information Sheet - Mexico](#)

### Foreign Government Agencies

[Comisión Reguladora de Energía \(CRE\)](#)

[Secretaría de Comunicaciones y Transportes \(SCT\)](#)

[Secretaría de Energía \(Sener\)](#)

[Secretaría de Medio Ambiente y Recursos Naturales \(Semarnat\)](#)

### Oil and Natural Gas

[ChevronTexaco Terminal GNL Mar Adentro de Baja California](#)

[PEMEX, the state-owned oil company of Mexico](#)

[Sempra Energy LNG Corporation](#)

### Electricity

[Calpine Corporation](#)

[Comisión Federal de Electricidad](#)

[Iberdrola](#)

[Luz y Fuerza del Centro](#)

[Union Fenosa](#)

## Sources

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Dallas Morning News

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Tractebel  
Transalta  
Union Fenosa  
Upstream  
U.S. Department of State  
U.S. Energy Information Administration  
World Gas Intelligence  
Wood MacKenzie  
World Markets Analysis Online  
World Wide Projects

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