

# COUNTRY ANALYSIS BRIEFS

## Venezuela

Last Updated: October 2007

### Background

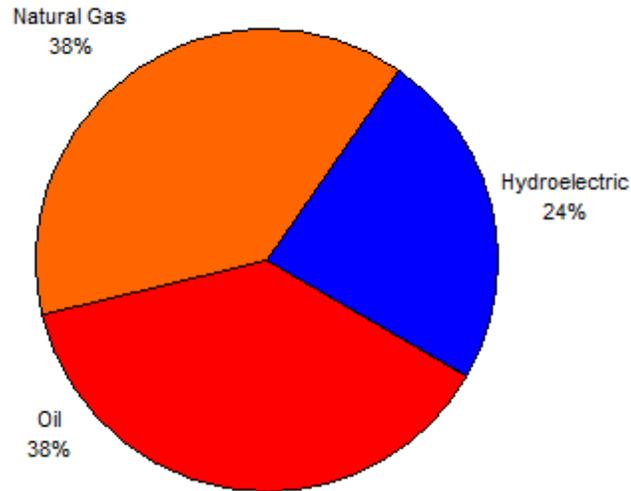
***Venezuela contains some of the largest oil and natural gas reserves in the world. It consistently ranks as one the top suppliers of U.S. oil imports and is among the top ten crude oil producers in the world.***

Venezuela is one of the world's largest exporters of crude oil and the largest in the Western Hemisphere. In 2006, the country was the sixth-largest net oil exporter in the world. The oil sector is of central importance to the Venezuelan economy: it accounts for more than three-quarters of total Venezuelan export revenues, about half of total government revenues, and around one-third of total gross domestic product (GDP). Venezuela was a founding member of the Organization of the Petroleum Exporting Countries (OPEC).



Natural gas and oil represent the bulk of total energy consumption in Venezuela. After reaching 46 percent of total energy consumption in 1998, the share of natural gas in Venezuela's oil mix has fallen to 38 percent. During the same period, the share of oil consumption has risen from 32 percent to 38 percent. Hydroelectricity represents the remainder of the country's energy mix, and Venezuela is well-endowed with hydroelectric potential.

### Total Energy Consumption in Venezuela, by Type (2005)



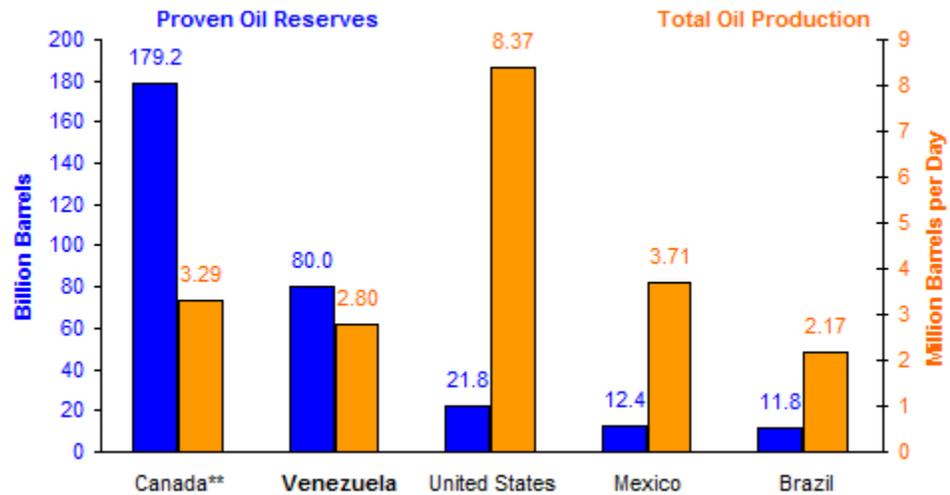
Source: International Energy Annual 2005

### Oil

**Venezuela was the world's sixth-largest net oil exporter in 2006.**

According to *Oil and Gas Journal (OGJ)*, Venezuela had 80.0 billion barrels of proven oil reserves in 2007, the largest amount in South America. Venezuela is a significant supplier of crude oil to the world market: in 2006, the country had net oil exports of 2.2 million barrels per day (bbl/d), sixth-largest in the world and the largest in the Western Hemisphere. In recent years, crude oil production in the country has fallen, mostly due to natural decline at existing oil fields.

### Western Hemisphere Proven Oil Reserves and Oil Production, 2006



Source: *Oil and Gas Journal*; EIA Short Term Energy Outlook

\*\*includes oil sands

### Sector Organization

Venezuela nationalized its oil industry in 1975-1976, creating Petroleos de Venezuela S.A. (PdVSA), the country's state-run oil and natural gas company. Along with being Venezuela's largest employer, PdVSA accounts for about one-third of the country's GDP, 50 percent of the government's revenue and 80 percent of Venezuela's exports earnings. In recent years, the Venezuelan government has reduced PdVSA's previous autonomy and amended the rules regulating the country's hydrocarbons sector. An example of this trend is the November 2004 appointment of Rafael Rodriguez, the energy minister, as chairman of PdVSA.

Nearly one-half of PdVSA's employees walked off the job on December 2, 2002 in protest against the rule of President Chavez. The strike severely impacted PdVSA, practically bringing the company's operations to a halt. PdVSA fired 18,000 workers following the strike, draining the company of technical knowledge and expertise. Industry analysts speculate that the strike did permanent damage to PdVSA's production capacity and remains the contributing factor to continued declines in production in recent years.

#### *Investment in Maintaining/Expanding Production*

Industry analysts estimate that PdVSA must spend some \$3 billion each year just to maintain production levels at existing fields, as many of these fields suffer annual decline rates of at least 25 percent. Affecting PdVSA's ability to meet its investment goals are the increasing demands placed upon its finances by the Venezuelan government. In 2004, the Venezuelan government established a special development fund to finance infrastructure projects throughout the country; PdVSA will supply billions of dollars per year directly to this fund. The company also funds additional social programs directly from its budget. These new priorities divert billions of dollars per year away from oil-related activities. Along with these directly-administered programs, PdVSA pays billions of dollars each year to the Venezuelan government in the form of income taxes and royalties.

#### *Foreign Operators*

In the 1990s, Venezuela opened its upstream oil sector to private investment. This collection of policies, called *apertura*, facilitated the creation of 32 operating service agreements (OSA) with 22 separate foreign oil companies, including international oil majors like Chevron, BP, Total, and Repsol-YPF. Under these contracts, companies operated oil fields, and PdVSA paid these companies a fee and purchased the produced crude at a price pegged to market rates. PdVSA also offered eight blocks under risk/profit sharing agreements (RPSA), under which PdVSA had an option to purchase up to a 35 percent equity stake in the project, if the foreign operator discovered commercial quantities of oil in the exploration phase. Finally, Venezuela established four "strategic associations" that produce extra-heavy crude, in which PdVSA held a financial interest.

In 2001, Venezuela enacted a new Hydrocarbons Law that superseded the previous 1943 Hydrocarbons Law and 1975 Nationalization Law. Under the 2001 law, royalties paid by private companies increased from 1-17 percent to 20-30 percent. Further, the law guaranteed PdVSA a majority share of any new projects. Finally, the law stipulated that all future foreign investment would be in the form of joint ventures (JV) with PdVSA, rather than the OSA, RPSA, or strategic associations. In August 2003, Venezuela's Ministry of Energy and Mines (MEM) transferred PdVSA's 32 operating contracts, the four strategic associations, and the risk exploration contracts to subsidiary Corporacion Venezolana de Petroleo (CVP). Legislation in 2006 later increased the royalty and income tax rates on the four strategic associations to 33.3 percent and 50 percent, respectively. In 2005, the Venezuelan government began to transition the OSAs to the new JV structure. In 2007, the Venezuelan Congress approved the final batch of JV agreements, with CVP having a 60 percent stake in most of the new companies. The RPSAs were also transitioned to the new JV structure.

In 2007, Venezuela completed the transition of the four strategic associations to new structures in alignment with the 2001 law. PdVSA increased its holdings in the four projects to an average of 78 percent, up from 40 percent. Of the six companies involved in the projects, two reduced their holdings to allow space for the enlarged PdVSA share (Total and Statoil), two maintained their previous stakes (Chevron, BP), and two exited completely from the projects (ConocoPhillips and ExxonMobil).

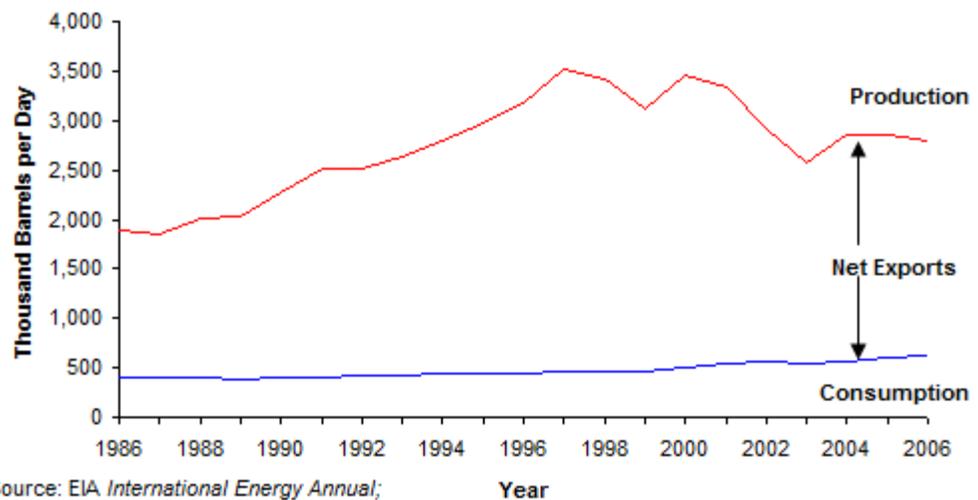
It is unclear how these recent events will influence foreign investment in Venezuela's oil sector. Most of the foreign oil companies have accepted the contract changes. Several factors that could influence oil company decisions include high world oil prices, increasing efficiency of operations (especially the strategic associations), and a desire to maintain access to Venezuela's large oil reserves. The future of foreign investment in Venezuela could shift to national oil companies (NOC), with the country's reserve classification plan for the Orinoco Belt (see "Magna Reserva" below) focused almost exclusively on other NOCs.

#### **Exploration and Production**

Venezuela's actual level of oil production is difficult to determine, with the country and independent industry analysts offering differing estimates. Most industry analysts and EIA estimate that the country produced around 2.8 million bbl/d of oil in 2006. These estimates

conclude that the country has not fully recovered from the strikes of 2002-2003. Another factor that complicates comparisons of Venezuelan oil production estimates are methodological and classification issues. For example, EIA estimates that, of Venezuela's 2.8 million bbl/d of oil production, 2.5 million bbl/d was crude oil and 300,000 bbl/d was condensate, natural gas liquids (NGL), and Orimulsion (see below). On the other hand, it is unclear what "other liquids" are included in official estimates of oil production. Another methodological issue is the measuring of crude oil production by the four extra-heavy strategic associations (see below). Some analysts count the extra-heavy oil produced by the associations as part of Venezuela's crude oil production. Others (including EIA) count the upgraded syncrude produced by the four as part of Venezuela's crude oil production, which is about 10 percent lower than the volume of the original extra-heavy feedstock.

**Venezuela's Oil Production and Consumption, 1986-2006**



Source: EIA *International Energy Annual*; *International Petroleum Monthly*; *Short Term Energy Outlook*

#### *PdVSA*

It is difficult to assess how much oil PdVSA actually produces, due to the issues discussed above. Independent analysts and EIA estimate that the company produced around 1.6 million bbl/d of crude oil in 2006, or around 60 percent of Venezuela's total crude oil production. This amount also includes 100,000 bbl/d of oil production that was transferred from the former OSA companies to PdVSA. This represents a decrease of 30 percent below independent estimates of pre-strike PdVSA crude oil production of 2.2 million bbl/d.

Venezuela has four major sedimentary basins: Maracaibo, Falcon, Apure, and Oriental. The crude oil held in these fields has an average API gravity of less than 20°, making Venezuela's conventional crude oil heavy by international standards. As a result, much of Venezuela's oil production must go to specialized domestic and international refineries. The Maracaibo basin contains slightly less than half of PdVSA's oil production. The fields in this area are very mature, requiring heavy investment to maintain current capacity. Centers of production in the area include Tomoporo, Lagunillas, and Tiajuana. In order to mitigate steep decline rates in the Maracaibo Basin, PdVSA re-injects natural gas into the reservoirs in order to increase pressure. In general, the fields in the Oriental basin are less mature than those in the west, and they were some of the first fields brought online after the 2002-2003 strike.

#### *Joint Ventures*

According to industry estimates, the fields operated by the JVs produced around 400,000 bbl/d of oil. Many of these fields are small and marginal, with steep decline rates. Production in recent years has fallen from 600,000 bbl/d, due to reduced investment levels prior to the transition from the old OSA structures and the transfer of some former OSA fields to direct PdVSA operatorship.

#### *Risk/Profit Sharing Agreements (RPSA)*

Of the eight RPSA contracts originally awarded by PdVSA, three resulted in the discovery of significant amounts of oil reserves: La Ceiba, Golfo de Paria Este and Golfo de Paria Oeste.

ConocoPhillips had planned to bring the 55,000-bbl/d Corocoro field onstream in Paria Oeste, along with equity partners PdVSA and Eni. Despite ConocoPhillips' exit from the Venezuelan oil sector, PdVSA has stated that it will bring Corocoro onstream by the end of 2007. Corocoro would represent Venezuela's first offshore oil production.

#### *Strategic Associations*

Venezuela contains billions of barrels in extra-heavy crude oil and bitumen deposits, most of which are situated in the Orinoco Belt in central Venezuela. Estimates of the recoverable reserves from the Orinoco Belt range from 100 to 270 billion barrels. Venezuela has established four strategic associations to exploit these resources. The strategic associations convert the extra heavy crude and bitumen from approximately 9° API to lighter, sweeter crude, known as syncrude. According to industry estimates, the four projects have installed production capacity of 580,000 bbl/d of syncrude (see table). However, production in the first half of 2007 was lower than this amount: OPEC decided in late 2006 to enact cuts in oil production, and media reports indicated that the four strategic associations were asked to bear most of Venezuela's contribution to this cut.

<b>Orinoco Belt Strategic Associations</b>				
<b>Project Name (New Name)</b>	<b>Petrozuata (Junin)</b>	<b>Cerro Negro (Carabobo)</b>	<b>Sincor (Boyaca)</b>	<b>Hamaca (Ayacucho)</b>
<b>Partners (percent)</b>	PdVSA (100)	PdVSA (83.34), BP (16.66)	PdVSA (60), Total (30.3), Statoil (9.7)	PdVSA (70), Chevron (30)
<b>Startup Date</b>	October 1998	November 1999	December 2000	October 2001
<b>Extra-Heavy Crude Production (bbl/d; API)</b>	120,000; 9.3°	120,000; 8.5°	200,000; 8-8.5°	200,000; 8.7°
<b>Syncrude Production (bbl/d; API)</b>	104,000; 19-25°	105,000; 16°	180,000; 32°	190,000; 26°

Venezuela plans to aggressively develop the Orinoco Belt oil resources in the coming years. PdVSA has begun a reserves certification program to increase the amount of proven oil reserves held by the country. The program, dubbed "Magna Reserva," includes seismic studies conducted by their company and several foreign partners in 27 blocks, and it is the first step towards more aggressive development of the Orinoco Belt reserves: companies that participate in the Magna Reserva will likely be the first considered for new upstream developments. PdVSA has teamed almost exclusively with foreign national oil companies for the program, including Petrobras (Brazil), Petropars (Iran), CNPC (China), and ONGC (India). In total, PdVSA estimated that the program could certify up to 260 billion barrels of total oil in place, though proven reserves would likely amount to no more than 20 percent (52 billion) of this total.

The certification program has begun to yield some concrete project proposals. In 2006, Petrobras (40 percent) and PdVSA (60 percent) established a joint venture to develop the Carabobo 1 block, which Petrobras is exploring as part of the Magna Reserva program. The project would initially produce 20,000 bbl/d of extra-heavy crude oil, peaking at 200,000 bbl/d. An offsite upgrader would further process the crude oil into lighter syncrude. According to media reports, the project has an estimated 28.6 billion barrels of oil in place, with an expected recovery rate of 20 percent. Production at the field could begin by 2009.

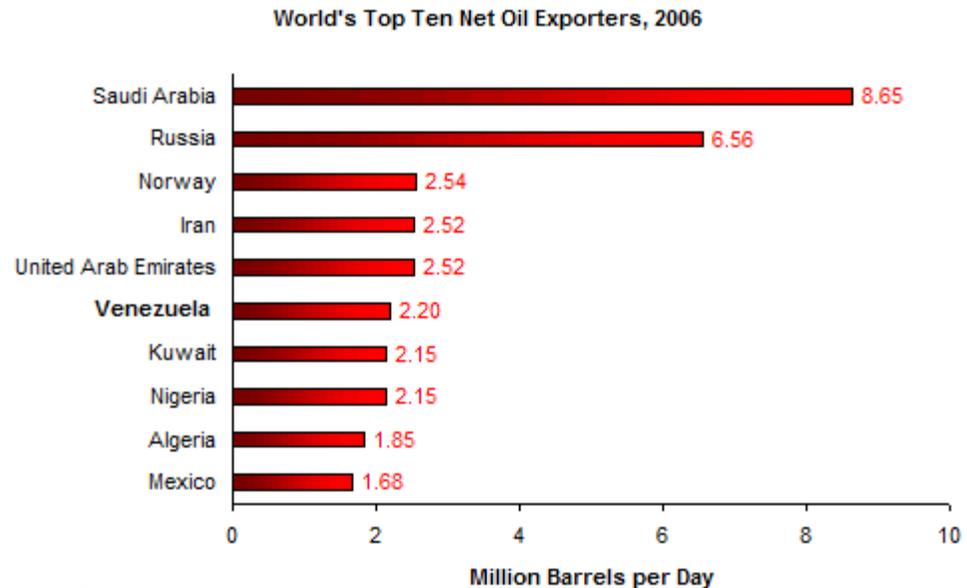
#### *Orimulsion*

Orimulsion® is a patented product developed by PdVSA for use as a boiler fuel. It is a mixture of approximately 70 percent natural bitumen, 30 percent water, and less than 1 percent surfactants (emulsifiers). Bitumen is a non-oil hydrocarbon and not counted towards Venezuela's OPEC crude oil production quota. Venezuela ceased Orimulsion production at the end of 2006, stating that it would be more profitable to sell the heavy oil directly or blending it with lighter oil streams. PdVSA marketed Orimulsion as an alternative to coal or fuel oil, especially in power plants.

#### **Exports**

In 2006, Venezuela consumed 620,000 bbl/d of oil and exported around 2.2 million bbl/d. The United States is the largest destination of Venezuela's petroleum exports. In 2006, the United States imported 1.41 million bbl/d of crude oil and petroleum products from Venezuela, 8 percent lower than the previous year. Over the long term, Venezuela's exports to the United States have

increased, but its share of U.S. total imports has fallen from 50 percent in 1960 to 10 percent in 2006. However, in recent years, Venezuelan petroleum exports to the United States have fallen, particularly exports of refined petroleum products. The U.S. Gulf Coast is the largest recipient of Venezuelan crude oil imports, with refineries there specifically configured to handle Venezuelan heavy crude varieties.



Besides the United States, other important destinations of Venezuelan petroleum exports include South America, Europe, and the Caribbean, though much of the crude oil that is exported to the Caribbean is later re-exported as petroleum products to the United States. One of the fastest growing destinations of Venezuelan crude oil exports has been China. In 2006, China imported about 80,000 bbl/d of oil from Venezuela, up from 39,000 bbl/d in 2005. In recent years, Venezuela has prioritized the diversification of its petroleum export destinations away from the United States, but the U.S. market will likely remain Venezuela's most important market for the foreseeable future.

#### *Discounted Oil Programs*

Venezuela provides a sizable amount of crude oil and refined products to its regional neighbors at below-market prices and with favorable financing terms. Under the auspices of the San Jose Accord, Venezuela and Mexico provide eleven Central American and Caribbean nations (Barbados, Belize, Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama and the Dominican Republic) with crude oil and products under preferential terms. Venezuela also has additional bilateral agreements with Cuba and Jamaica, sending those countries 92,000 bbl/d and 21,000 bbl/d, respectively, of crude oil and petroleum products under favorable terms.

The PetroCaribe signed in 2005, provides some 70,000 bbl/d of discounted crude oil and refined products to numerous countries in the Caribbean. PetroCaribe allows the importing countries to pay for a portion of the oil imports with long-term, low-interest loans or barter oil for other goods.

Venezuela has also targeted bilateral deals towards South America. In 2005, PdVSA signed deals with Paraguay and Uruguay to supply discounted petroleum products and work to upgrade the countries' refineries to process Venezuelan crude varieties. In August 2005, Venezuela agreed to provide Ecuador with a temporary crude oil loan to help the country through a disruption to its production facilities.

#### **Pipelines**

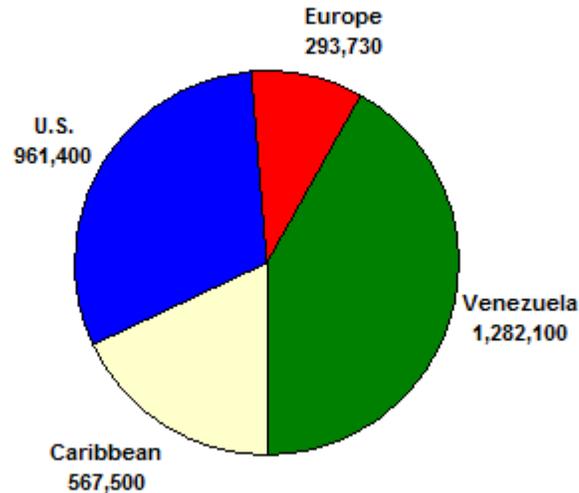
Venezuela has an extensive domestic oil pipeline system, providing transportation from production centers to refineries and coastal export terminals. Currently, the country does not have

any export pipelines, but there has been discussion about constructing an oil pipeline to port in Colombia along the Pacific Ocean. This would facilitate greater Venezuelan crude exports to Asia, bypassing the Panama Canal bottleneck or the high costs of shipping around Cape Horn.

### Refining

According to *OGJ*, Venezuela had 1.28 million barrels per day (bbl/d) of crude oil refining capacity in 2007, all operated by PdVSA. The major facilities include the Paraguana Refining Center (955,000 bbl/d), Puerto de la Cruz (195,000 bbl/d), and El Palito (126,900 bbl/d). Through PdVSA and its subsidiary CITGO, Venezuela also controls significant refining capacity outside of the country.

**PdVSA's Crude Oil Refining Capacity\*, by Region, 2007**  
(thousand barrels per day)



Source: PdVSA, CITGO, *Oil and Gas Journal*

\*Includes direct operatorship and equity stakes

### CITGO

CITGO is a wholly-owned subsidiary of PdVSA that has some 14,000 branded retail outlets (both directly owned and affiliates) in the United States. CITGO operates three product refineries (Lake Charles, LA; Corpus Christi, TX; Lemont, IL), with a combined crude oil distillation capacity of 755,400 bbl/d. CITGO also operates two asphalt refineries (Paulsboro, NJ; Savannah, GA), though the company is reportedly interested in selling those facilities. CITGO sources most of its crude oil under long-term contracts with PdVSA, though the Lemont facility receives most of its feedstock from Canada. Besides its holding through CITGO, PdVSA also owns shares in some U.S. crude oil refining capacity directly, including a 50 percent stake in the Chalmette facility in Louisiana and certain units at ConocoPhillips' Sweeny, Texas refinery.

### Caribbean/South America

In October 1998, PdVSA acquired a 50 percent equity interest in the Hovensa refinery, located in St. Croix, U.S. Virgin Islands. Amerada Hess holds the other 50 percent interest in the refinery, which has a capacity of 495,000 bbl/d. The U.S. Virgin Islands imported around 300,000 bbl/d of crude oil from Venezuela in 2006. In the Netherlands Antilles, PdVSA leases the 320,000-bbl/d Isla refinery on the island of Curacao. Most of the products produced by these refineries are exported to the U.S. or other regional markets.

PdVSA has looked toward South America to further increase its regional refining capacity. In February 2005, PdVSA signed an agreement with Petrobras to build a new, 200,000-bbl/d refinery in the northeastern Brazilian state of Pernambuco at a cost of \$4 billion. In September 2007, Brazil officially broke ground on the facility, even though the two countries had not reached a formal agreement concerning the project. The facility will have units designed to process the very heavy varieties of crude oil produced by Venezuela and Brazil.

### Europe

PdVSA participates in two joint refining ventures in Europe, with the company holding equity

interest in 294,000 bbl/d of refining capacity in the region. PdVSA holds a 50 percent stake in AB Nynas, a Swedish company that operates five refineries: Nynashamm (Sweden), Gothenburg (Sweden), Antwerp (Belgium), Eastham (England), and Dundee (Scotland); PdVSA's share of this capacity is 50,500 bbl/d. PdVSA also holds a 50 percent stake in Ruhr Oel, in partnership with BP. Ruhr Oel holds ownership stakes in five German refineries, Gelsenkirchen, Neustad, Karlsruhe, and Schwedt, with PdVSA's share of this capacity at 243,000 bbl/d.

## Natural Gas

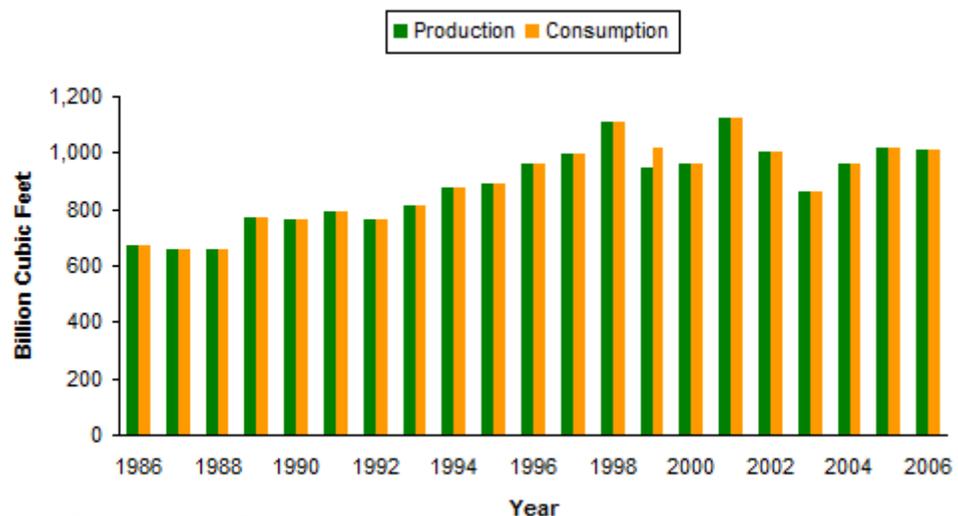
**Venezuela has the second-largest natural gas reserves in the Western Hemisphere.**

According to *Oil and Gas Journal*, Venezuela had 152 trillion cubic feet (Tcf) of proven natural gas reserves in 2007, the second largest in the Western Hemisphere behind the United States. In 2006, the country produced and consumed 1 trillion cubic feet (Tcf) of natural gas. An estimated 90 percent of Venezuela's natural gas reserves are associated. According to Enagas, the principle government agency charged with regulating the natural gas sector, the petroleum industry consumes over 70 percent of Venezuela's natural gas production, with the largest share of that consumption in the form of re-injection to aid crude oil extraction.

### Sector Organization

In 1999, Venezuela adopted the Gas Hydrocarbons Law, which opened all aspects of the natural gas sector to private investment. The goals of the law included the development of natural gas resources, especially non-associated fields; expansion of the domestic natural gas transport network, creation of a general distribution system; promotion of natural gas export projects; and increased consumption of natural gas by the power and petrochemical industries.

Venezuela's Natural Gas Production and Consumption, 1986-2006



Source: EIA *International Energy Annual*

The Gas Hydrocarbons Law also allowed private operators to own 100 percent of non-associated projects, a sharp contrast to the ownership rules in the oil sector. Furthermore, royalty and income tax rates on non-associated natural gas projects are much lower than corresponding rates for oil projects. The law does give PdVSA the right to purchase a 35 percent stake in any project that moves into commercial status.

### Exploration and Production

PdVSA produces the largest amount of natural gas in Venezuela. There is currently limited private participation in the sector. Repsol-YPF is the largest private natural gas producer in Venezuela, with 2005 production of 337 million cubic feet per day (MMcf/d). In September 2005, Repsol-YPF began production from the first stage of its Barrancas Block project, which contains an estimated 2-6 Tcf of natural gas reserves. The project integrates natural gas production and an 80-megawatt (MW) power station in Portuguesa. In April 2004, Total began first production in the Yucal Placer blocks, with an initial output of 100 MMcf/d. Petrobras operates the Tinaco and San Carlos projects, while Argentina's Pluspetrol is developing the Tiznado-Barbacoas field.

### Plataforma Deltana

PdVSA awarded exploration blocks to Chevron and Statoil in 2003 in the Plataforma Deltana area, located off Venezuela's northeast coast adjacent to the country's maritime boundary with Trinidad and Tobago. Chevron began exploration in 2004 of the Loran field (Block 2), drilling three wells. The company also announced in June 2005 that it had drilled a successful exploratory well in its adjacent Lau-Lau field (Block 3). Statoil holds the exploration license for the Cocuina field (Block 4), along with equity partner Total. In 2007, it drilled two successful test wells in the area. PdVSA announced plans in 2006 to develop El Dorado (Block 5) itself, without an international partner. Block 5 was offered in licensing rounds twice, without any takers.

Greater development of Plataforma Deltana will likely depend upon cooperation with Trinidad and Tobago, which already has sizable production activities in its adjacent territorial waters. Along with its interests in the Loran block, Chevron operates the Manatee natural gas project in Trinidad and Tobago that is adjacent to Plataforma Deltana. In March 2007, the two countries reportedly agreed to jointly develop natural gas reserves that straddle their border. There has also been discussion about exporting Venezuelan natural gas via Trinidad and Tobago's Atlantic LNG facility (see [Caribbean Regional Analysis Brief](#) for more info), but there has not been any concrete proposals in this regard.

### Pipelines

In recent years, Venezuela has improved its domestic natural gas transport network, to allow greater domestic utilization and movement of gas production. The Interconnection Centro Occidente (ICO) system connects the central and western parts of the country, making natural gas more easily available to domestic consumers and for re-injection into the western oil fields.

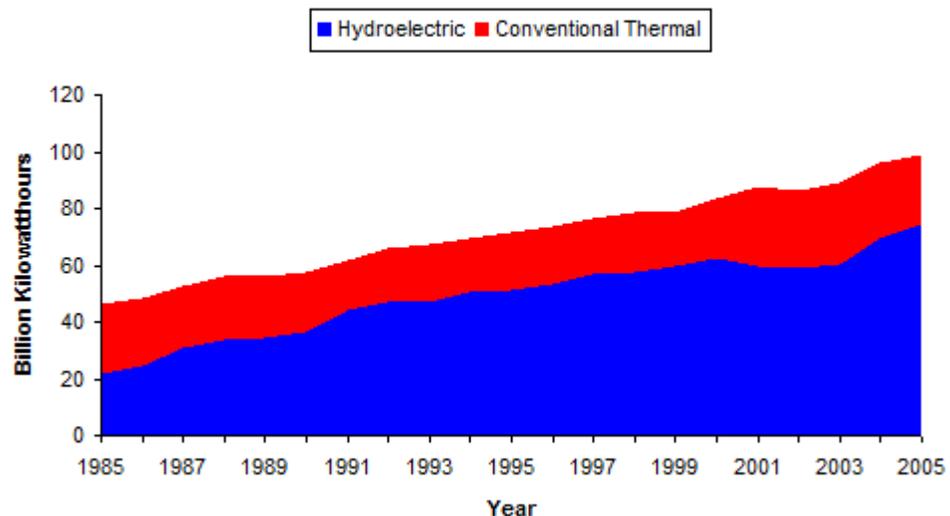
In July 2006, construction began on a natural gas pipeline linking Colombia with Venezuela. The 130-mile, 150-MMcf/d system will connect Colombian natural gas production in Punta Ballenas with oil production facilities in the Lake Maracaibo area. Initially, the pipeline will supply Venezuela with additional natural gas supplies for enhanced oil recovery, but Venezuela eventually plans to reverse the flow of the pipeline once it has further developed its own domestic natural gas reserves. Construction on the system is scheduled for completion by the end of October 2007.

## Electricity

**Like most South American countries, Venezuela depends upon hydroelectricity for the bulk of its electricity needs.**

In 2005, Venezuela had 22.1 gigawatts of installed generating capacity. In 2005, the country generated 99.2 billion kilowatthours (Bkwh) of electricity, while consuming 73.4 Bkwh. The country generated 74.3 Bkwh of hydroelectricity in 2005, representing 75 percent of total electricity generation that year. Venezuela is a net exporter of electricity, with the majority of exports sent to Brazil and smaller amounts going to Colombia.

Venezuela's Electricity Generation, by Source, 1985-2005



Source: EIA International Energy Annual

### Sector Organization

Large, state-owned companies dominate the electricity sector in Venezuela. The largest company is Electrificación del Caroni (EDELCA), a subsidiary of the state-owned mining company Corporación Venezolana de Guayana (CVG); EDELCA supplies around three-quarters of Venezuela's total electricity supply. There is a high degree of vertical integration within the electricity sector, with the largest generating companies also acting as the largest distributors. OPSIS is the principle government agency responsible for regulating the sector and managing Venezuela's national transmission grid.

In 2007, Venezuela nationalized La Electricidad de Caracas (EDC), majority-owned by U.S.-based AES. EDC had been the largest private electricity generator in the country, supplying around one-tenth of the country's total electricity supply.

### Hydroelectricity

Hydroelectricity provides the bulk of Venezuela's electricity supply. The Caroni River in Guayana state is the center of the country's hydro production. EDELCA operates the 8,900-megawatt (MW) Guri (Raul Leoni) facility on the Caroni, the second-largest hydroelectric plant in the world, after Itaipu on the Paraguay/Brazil border (once fully operational, China's Three Gorges Dam will be larger than both of these). EDELCA also operates the 2,900-MW Macagua and the 2,200-MW Caruachi facilities, both on the Caroni. EDELCA is currently building a fourth plant on the Caroni, the 2,200-MW Tocoma dam, with scheduled completion in 2010.

### Conventional Thermal

Natural gas powers around one-half of the conventional thermal electricity generation in Venezuela, followed by fuel oil and diesel. There has been increasing investment in conventional thermal capacity as a means to reduce reliance upon hydropower and utilize domestic hydrocarbon resources. PdVSA announced in 2005 that it would spend \$500 million to build three thermal plants in northern Venezuela. CADEFE plans to build two power plants at refineries in the country: one at Puerto La Cruz, the other at Paraguana. In late 2004, CADEFE also stated that it was studying the feasibility of building Venezuela's first coal-fired power plant, a 300-MW facility in Tachira state, in cooperation with Russia's Energoprom.

## Quick Facts

### Energy Overview

<b>Proven Oil Reserves (January 1, 2007E)</b>	80 billion barrels
<b>Oil Production (2006E)</b>	2.8 million barrels per day
<b>Oil Consumption (2006E)</b>	620 thousand barrels per day
<b>Crude Oil Distillation Capacity (2007E)</b>	1,282.1 thousand barrels per day
<b>Proven Natural Gas Reserves (January 1, 2007E)</b>	152 trillion cubic feet
<b>Natural Gas Production (2006E)</b>	1.0 trillion cubic feet
<b>Natural Gas Consumption (2006E)</b>	1.0 trillion cubic feet
<b>Recoverable Coal Reserves (2004E)</b>	528 million short tons
<b>Coal Production (2006E)</b>	8.22 million short tons
<b>Coal Consumption (2006E)</b>	0.08 million short tons
<b>Electricity Installed Capacity (2005E)</b>	22.1 gigawatts
<b>Electricity Production (2005E)</b>	99.2 billion kilowatt hours
<b>Electricity Consumption (2005E)</b>	73.4 billion kilowatt hours
<b>Total Energy Consumption (2005E)</b>	3.1 quadrillion Btus*, of which Natural Gas (38%), Oil (38%), Hydroelectricity (24%), Coal (0%), Nuclear (0%), Other Renewables (0%)
<b>Total Per Capita Energy Consumption (2005E)</b>	124.2 million Btus
<b>Energy Intensity (2005E)</b>	16,493 Btu per \$2000-PPP**

### Environmental Overview

<b>Energy-Related Carbon Dioxide Emissions (2005E)</b>	151.3 million metric tons
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<b>Per-Capita, Energy-Related Carbon Dioxide Emissions (2005E)</b>	6.0 metric tons
<b>Carbon Dioxide Intensity (2005E)</b>	0.8 Metric tons per thousand \$2000-PPP**

## Oil and Gas Industry

<b>Organization</b>	State-owned Petroleos de Venezuela, SA (PdVSA) is most dominant player; foreign participation occurs in partnership with PdVSA.
<b>Major Oil/Gas Ports</b>	Amuay , Cardon, Puerto de la Cruz
<b>Foreign Company Involvement</b>	BP, Chevron, CNPC, Repsol-YPF, Shell, Statoil, Total
<b>Major Refineries (capacity, bbl/d)</b>	Paraguana Refining Center (955,000), Puerto de la Cruz (195,000), El Palito (126,900), San Roque (5,200)

\* 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

[International Petroleum Monthly](#)  
[EIA - Country Information on Venezuela](#)  
[Table 3a: OPEC Oil Production from EIA](#)

### U.S. Government

[U.S. Embassy in Caracas, Venezuela](#)  
[CIA World Factbook - Venezuela](#)  
[U.S. State Department's Consular Information Sheet - Venezuela](#)  
[U.S. State Department Background Notes - Venezuela](#)

### Associations and Institutions

[Organization of American States \(OAS\)](#)

### Foreign Government Agencies

[Banco Central de Venezuela](#)  
[Corporación Venezolana de Guayana](#)  
[Instituto Nacional de Estadística](#)  
[Oficina de Operación de Sistemas Interconectados \(OPSIS\)](#)  
[Ministerio de Energía y Minas](#)

### Oil and Natural Gas

[British Petroleum \(BP\)](#)  
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[PdVSA](#)

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