

COUNTRY ANALYSIS BRIEFS

Venezuela

Last Updated: September 2005

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

Background

Despite political turmoil, Venezuela's economy has almost fully recovered from the 2002-2003 period, registering real GDP growth of 16.8 percent in 2004. High world oil prices have helped fuel Venezuela's recovery, as the petroleum industry is the mainstay of the country's economy. The oil sector accounts for more than three-quarters of total Venezuelan export revenues, about half of total government revenues, and about one-third of GDP. Continuing high world oil prices will likely continue to drive Venezuela's economy, with Global Insight forecasting that the country's GDP will grow by 6.0 percent in 2005 and 4.1 in 2006.



After a period of modest economic growth in 2000 and 2001, the Venezuelan economy entered into recession in 2002. Political conflict, particularly a nationwide strike beginning early in December 2002, further compounded the deteriorating economic situation. On December 2, 2002, opponents of President Chavez organized a nationwide strike to call for an early referendum on the President's rule. Employees from Venezuela's state-owned oil company Petroleos de Venezuela S.A. (PdVSA) also joined the strike, shutting down a large portion of the country's oil industry and drastically reducing the production of Venezuelan oil and its delivery to internal and external markets. President Chavez declared the strikers' demands unconstitutional and dismissed nearly half of PdVSA's workforce. In 2003, the strike, along with the implementation of currency controls, severely impacted Venezuela's economy, with real gross domestic product (GDP) contracting 29 percent in the first quarter, and 9.2 percent for the entire year, after already contracting 8.9 percent in 2002.

In early 2004, Venezuela's opposition movement pushed for a constitutional referendum on Chavez's presidency. On June 2, 2004, Venezuela's National Electoral Council (CNE) announced that the opposition had collected enough signatures to trigger a recall vote, scheduled for August 15, 2004. However, Chavez won the vote by a comfortable margin, and his political party went on to win local elections in October 2004.

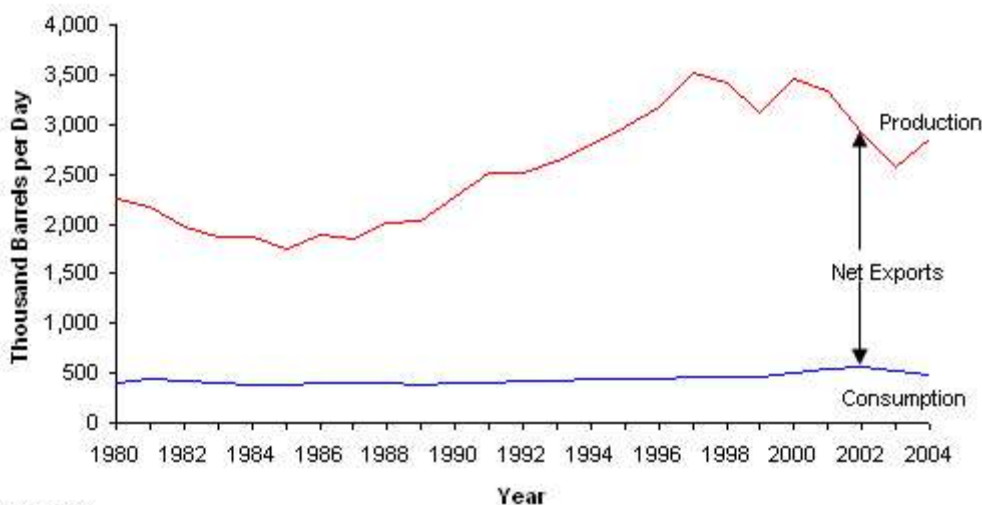
Oil

Venezuela was the world's fifth-largest net oil exporter in 2004.

According to Oil and Gas Journal (OGJ), Venezuela had 77.2 billion barrels of proven conventional oil reserves, the largest amount in the Western Hemisphere. This estimate, however, does not include substantial extra-heavy and bitumen deposits, which could be as high as 270 billion barrels. Venezuela is a founding member of the Organization of Petroleum Exporting Countries (OPEC), and it is a significant supplier of crude oil to the world market.

Venezuela's actual level of crude oil production is difficult to determine, with the country and independent industry analysts offering different numbers. According to statements by the Venezuelan government, the country produced 3.1 million barrels per day (bbl/d) of crude oil in 2004. On the other hand, most industry analysts and EIA estimated that the country actually produced 2.5-2.6 million bbl/d of crude oil in 2004, as they believed the country had not fully recovered from the strikes of 2002-2003 and noted that GDP data released by the Venezuelan Central Bank supported a lower level of production. Further, in a statement filed with the U.S. Securities and Exchange Commission (SEC) in August 2005, PdVSA reported that nationwide crude production in 2003 was 2.76 million bbl/d (PdVSA must file regular financial statements with the SEC due to its external debt obligations).

Venezuela's Oil Production and Consumption, 1980-2004



Source: EIA

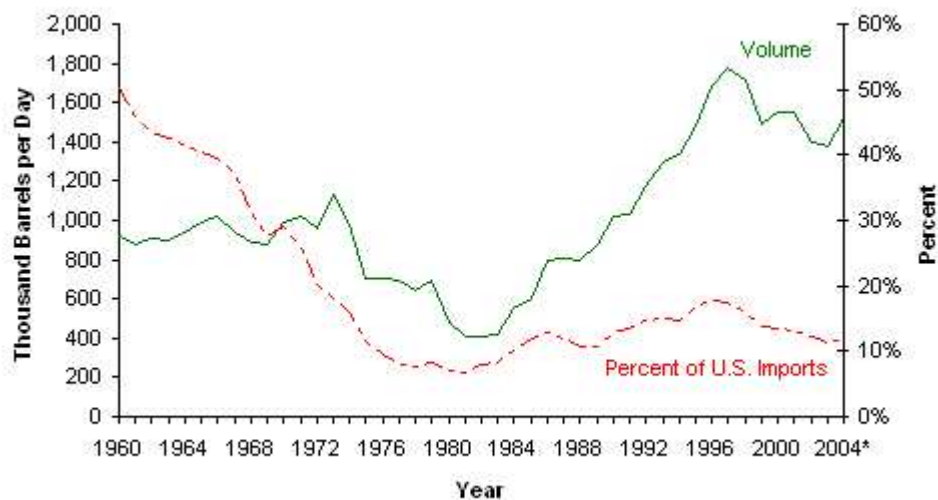
In the past, Venezuela regularly exceeded its OPEC production quota. However, since his election in 1998, President Chavez has maintained a policy of strong adherence to the country's quota, seeking to increase oil revenues through higher world oil prices rather than increased production. In order to meet its quote, Venezuela has occasionally shut-in some production and delayed bringing new capacity online. Most independent analysts believe, though, that Venezuela is currently producing well below its quota of 3.22 million bbl/d since the 2002-2003 strike.

Oil Exports

Venezuela consistently ranks as one of the top four sources of U.S. oil imports.

According to PdVSA, Venezuela exported 2.03 million bbl/d of oil and petroleum products in 2003. The United States is the most important destination for these exports, receiving 68 percent of total oil exports in 2003, according to PdVSA export data and EIA import data; in addition, much of the oil that Venezuela exports to the Caribbean is later re-exported to the United States as refined products. In recent years, Venezuela has ranked consistently as one of the four top sources of U.S. petroleum imports, along with Canada, Mexico, and Saudi Arabia. In 2004, Venezuela exported 1.53 million bbl/d of crude oil and refined products to the U.S., representing 11.8 percent of all U.S. oil imports. The U.S. Gulf Coast is the largest recipient of these imports, receiving 78 percent in 2004.

In addition to being a major supplier to the United States, Venezuela also provides significant quantities of oil to its regional neighbors. 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 supplies Cuba with 78,000 bbl/d of oil on favorable financing terms under an agreement originally signed between President Chavez and Cuban President Fidel Castro in 2000.

Venezuela's Total Oil Exports to the United States, 1960-2004*

Source: EIA

*Preliminary data

Recently, Venezuela has pushed the creation of regional oil initiatives for the Caribbean (Petrocaribe), the Andean region (Petroandino), and South America (Petrosur), and Latin America (Petroamerica). The initiatives include assistance for oil developments, investments in refining capacity, and preferential oil pricing. The most developed of these three is the Petrocaribe initiative, with 13 nations signing a preliminary agreement in 2005. Under Petrocaribe, Venezuela will offer crude oil and petroleum products to Caribbean nations under preferential terms and prices, with Jamaica as the first nation to sign on in August 2005.

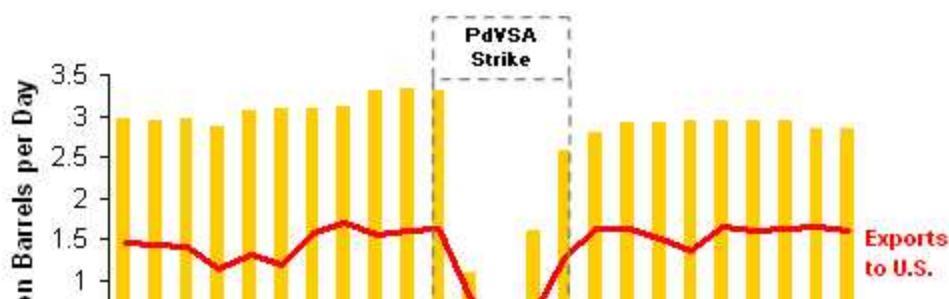
In April 2004, PdVSA completed the construction of a new oil export terminal at the eastern port of Jose, increasing the country's crude oil export capacity by 230,000 bbl/d.

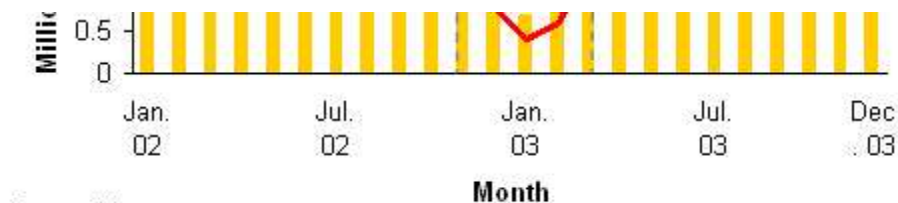
Sector Organization

PdVSA is Venezuela's most important source of government revenues and export earnings.

Venezuela nationalized its oil industry in 1975-1976, creating 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, under the influence of President Chavez, 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, Chavez's 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 all the company's operations to a halt. Venezuela's national oil production dropped from 3.3 million bbl/d in November 2002 to 700,000 bbl/d in January 2003, almost all of which represented foreign operators in the country. Since the strike ended in early 2003, there has been substantive progress in restoring production. However, industry analysts speculate that the strike did permanent damage to PdVSA's production capacity. PdVSA fired 18,000 workers following the strike, draining the company of technical knowledge and expertise. Some analysts have pointed out that the government's hurried restoration of PdVSA's production may have caused reservoir damage, potentially accelerating the rate of decline in those fields in coming years.

Venezuela's Total Oil Production, 2002-2003



Source: EIA

Investment in Maintaining/Expanding Production

PdVSA has stated that it will invest \$26 billion in expanding hydrocarbon reserves and production between 2004-2009, with the goal of increasing national oil production to 5 million bbl/d by 2009. In August 2005, PdVSA announced that it would increase national oil production to 5.84 million bbl/d by 2012. 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 25 percent. PdVSA announced a \$5 billion capital investment plan for 2004, with the company announcing that it had spent 75 percent of that amount by November. However, independent oil analysts speculated that total spending was closer to 20 percent of the annual budget, with oil services firms and observed rig activity in the country seeming to support this lower figure.

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 \$2 billion a year directly to this fund, bypassing the Venezuelan Central Bank. Further, government plans have the company spending an additional \$2-3 billion per year on social programs. In addition, PdVSA already pays billions of dollars each year to the Venezuelan government in the form of income taxes, royalties, and dividends. Finally, because of the aforementioned international agreements between Venezuela and its neighbors, PdVSA is selling significant amounts of oil below market value, further eroding its available cash flow. It is unclear how the company will be able to afford its ambitious investment plans, though PdVSA officials have mentioned that the company might increase its international borrowing.

Foreign Operators

Venezuela opened its oil sector to foreign operators in the 1990s.

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 operate oil fields, and PdVSA pays these companies a fee and purchases the produced crude at a price pegged to market rates. PdVSA also offered eight blocks under risk/profit sharing agreements (RPSA), under which the company has an option to purchase up to a 35 percent equity stake in the project, if the foreign operator discovers commercial quantities of oil in the exploration phase. Finally, PdVSA holds shares in four "strategic associations" that produce extra-heavy crude, for eventual upgrading to syncrude (see below for more details).

In 2001, Venezuela passed 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 guarantees PdVSA a majority share of any new projects. Finally, the law stipulates that all future foreign investment would be in the form of joint ventures (JV) with PdVSA, rather than the aforementioned OSA, RPSA, or strategic associations.

In August 2003, Venezuela's Ministry of Energy and Mines (MEM) transferred PdVSA's 33 operating contracts, the four strategic associations, and the risk exploration contracts to subsidiary Corporacion Venezolana de Petroleo (CVP). The move intends to allow PdVSA to concentrate on production from its own fields, while CVP will administer the agreements.

Because of the doubts, discussed above, about PdVSA's ability to fund sufficient investment in expanding crude oil production capacity, Venezuela will likely need to depend heavily upon foreign operators to meet its production goals of 5.84 million bbl/d by 2012. However, recent events have begun to cloud the investment climate in Venezuela's oil sector. In November 2004, President Chavez announced that the royalty rate on the four strategic associations would increase from 1 percent to 16.6 percent, the highest rate allowable under the older hydrocarbons laws. MEM also announced in April 2005 that foreign operators must convert all OSA projects to new JV agreements under the terms of the 2001 Hydrocarbons Law by the end of 2005, including the higher royalty, tax rates, and level of PdVSA ownership stipulated by the 2001 law.

As well as changing the current nature of foreign participation in its oil sector, Venezuela has begun a campaign to collect taxes retroactively on foreign operators. According to Semit, the

Venezuelan tax agency, foreign oil companies owe \$4 billion in back taxes through 2001, the farthest date in the past that Venezuelan law authorizes Semit to collect taxes. When Venezuela authorized the OSA projects in the 1990s, it classified the foreign operators as "contracted help," therefore eligible for a 34 percent income tax rate, rather than the 50 percent income tax rate levied on oil operations. Semit announced in 2005 that this original classification was illegal, therefore OSA operators owned some \$3 billion in back taxes. In a similar vein, Semit claimed that foreign partners in the strategic associations owed \$1 billion in back taxes.

Some foreign companies operating OSA projects in Venezuela have reported that PdVSA has begun to make chronically late payments for oil produced by the projects. For example, in June 2005, U.S.-based Harvest Natural Resources reported that PdVSA had not paid it \$64 million for oil delivered in the first quarter of 2005. PdVSA stated this and similar delays in payments to other companies were the result of a new policy of paying for some of the OSA expenses in bolivars, the local currency, rather than paying for all expenses in dollars, the previous practice; according to PdVSA, it needed additional time to calculate the proper mix of bolivars and dollars in the payment.

It is unclear how these recent events will influence foreign investment in Venezuela's oil sector. For example, while the foreign companies taking part in the strategic associations disputed the legality of the royalty hike, they acquiesced to the government's demands: in light of the increasing efficiency of the projects and prevailing high world oil prices, they held that the hike will only have a small impact on the profitability of their operations. Further, OSA participants complained that the new JV structure and higher tax and royalty rates would make their projects unprofitable. However, all 22 companies operating OSA projects agreed to pay at least part of the back taxes demanded by Semit. In addition, eight of the 22 companies had already moved to the new JV structure by the end of August 2005.

Exploration and Production

In general, PdVSA is directly responsible for 50-60 percent of Venezuela's national oil production.

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 degrees, 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.

PdVSA

It is difficult to assess how much oil PdVSA actually produces. Independent industry analysts estimated that the company produced 1.3 million bbl/d of crude oil in 2004, while PdVSA executives place the company's 2004 production at 1.9 million bbl/d. With production by OSA projects and strategic associations estimated at a total of around 1.2 million bbl/d, PdVSA therefore is responsible for 50-60 percent of Venezuela's national oil production.

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 late 2004, PdVSA completed an expansion project at the Tomoporo field that increased production to 116,000 bbl/d from 100,000 bbl/d. PdVSA stated that Tomoporo contains over one billion barrels of recoverable reserves, and the company hopes that future expansion will increase production at the field to 250,000 bbl/d by 2008. Adjacent to Tomoporo, PdVSA is also conducting exploratory operations in the Franquera field, which it believes contains 500 million barrels of reserves. PdVSA hopes to increase production from the Tiajuana field from its current 312,000 bbl/d to 527,000 bbl/d by 2012. 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. PdVSA planned to launch additional exploration in 2005 at the El Tejero and Cotoperi fields, near the existing El Carito and El Furrial fields in Monagas state. In November 2004, the company announced that it had discovered sizable deposits of medium crude oil in the Travis field, also in Monagas state.

Operating Service Agreements (OSA)

According to industry estimates, OSA projects produced 600,000 bbl/d in 2004. The Venezuelan government announced that all OSA projects must convert to JVs under the new 2001 Hydrocarbons Law by the end of 2005 (see above). Despite the aforementioned protests from OSA operators about the switch to the new JV structure, some OSA operators have commented that they welcome the change: they will now have ownership of some of the oil produced by these projects, whereas the existing arrangements force them to sell it all to PdVSA at a predetermined price.

One of the largest firms participating in OSA projects is Brazil's Petrobras. The company operates

the Oritupano-Leona field, with Anadarko holding a 45 percent equity stake. Petrobras planned to drill 15 development wells and work over 50 existing wells in the field. Petrobras also won a tender in February 2005 to develop 20 mature fields in the country. In August 2005, PdVSA reportedly signed an agreement with the China National Petroleum Corporation (CNPC) to jointly develop the Zumano area of eastern Venezuela, which contains an estimated 400 million barrels of crude. PdVSA has also discussed joint ventures with Russia's Lukoil.

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 (West). ConocoPhillips, the operator of the Golfo of Paria Oeste block, plans to bring the 55,000-bbl/d Corocoro field onstream, along with equity partners PdVSA (35 percent) and Eni (26 percent). Originally slated for start-up in 2006, first production will now likely not occur until 2007. ConocoPhillips is also actively exploring in its Golfo de Paria Este block.

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. PdVSA 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, at the Jose refinery complex on Venezuela's northern coast. The International Energy Agency (IEA) considers syncrude a "non-conventional crude oil." However, EIA categorizes it as part of Venezuela's oil production. According to industry sources, the four projects produced a combined 570,000 bbl/d of syncrude in 2004 (see chart).

Venezuela plans to aggressively develop the Orinoco Belt oil resources in the coming years. PdVSA has divided the area into 27 blocks, with plans to auction these in licensing rounds following an exhaustive survey of the region. Even before the completion of this formal process, PdVSA has already noted potential interest from several foreign operators. In August 2005, PdVSA awarded the Junin 7 block to Repsol-YPF, a 200 square mile area of the Orinoco Belt. Also in August 2005, PdVSA signed an agreement with CNPC to develop the Junin 4 block, thought to contain 20 billion barrels of extra heavy crude and bitumen. Royal Dutch Shell has begun talks with PdVSA about a new syncrude project that could entail an investment of \$4-8 billion.

Despite the controversy over back taxes or the increased royalty rate on syncrude projects (see above), existing Orinoco operators are also showing interest in expanding their projects in the area. Chevron, operator of the Hamaca project, signed a letter of intent with PdVSA in April 2005 to invest \$6 billion in a new syncrude project, with potential output of 200,000-400,000 bbl/d. Total and PdVSA began negotiations in March 2005 on a plan to build a \$5 billion second phase of the Sincor project, which currently produces 180,000 bbl/d of syncrude. Any new syncrude project would fall under Venezuela's 2001 Hydrocarbons Law, rather than the existing agreements, meaning higher royalty rates and requirements for PdVSA majority ownership of any new developments.

Orinoco Belt Strategic Associations				
Project Name (New Name)	Petrozuata (Junin)	Cerro Negro (Carabobo)	Sincor (Boyaca)	Hamaca (Ayacucho)
Partners (percent)	PdVSA (49.9), ConocoPhillips (50.1)	PdVSA (41.67), ExxonMobil (41.67), BP (16.66)	PdVSA (38), Total (47), Statoil (15)	PdVSA (30), ConocoPhillips (40), Chevron (30)
Startup Date	October 1998	November 1999	December 2000	October 2001
Extra-Heavy Crude Production (bbl/d; API)	120,000; 9.3°	120,000; 8.5°	200,000; 8-8.5°	190,000; 8.7°
Syncrude Production (bbl/d; API)	104,000; 19-25°	105,000; 16°	180,000; 32°	180,000; 26°

Orimulsion

Orimulsion® is a patented product developed by PdVSA for use as a boiler fuel. PdVSA markets Orimulsion as an alternative to coal or fuel oil, especially in power plants. 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. There is a single Orimulsion plant in Cerro Negro, with a capacity of 5.2 million metric tons per year (mt/y).

The future of Orimulsion production, however, is unclear. Production is currently 40,000 bbl/d down from a peak of 100,000 bbl/d. In April 2005, PdVSA announced that it would cease Orimulsion production within twelve months. The company claims that, due to prevailing high oil prices, it is more profitable to sell its heavy and extra-heavy crude varieties as upgraded syncrude or blended crude oil. PdVSA stated that it would continue to produce Orimulsion only until it had met its contractual obligations.

The decision to stop Orimulsion production has not been without controversy. In August 2005, Canada's New Brunswick (NB) Power filed a \$1.6 billion suit against PdVSA, alleging that the company had broken a supply commitment to NB Power's Coleson Cover power plant. NB Power conceded that PdVSA never actually signed the agreement, but that PdVSA signaled its intent to supply Orimulsion to the company. An international arbitration panel agreed to hear a case against PdVSA brought by Italy's Enel, in which the company claims \$200 million in damages due to the lost Orimulsion supply.

Despite PdVSA statements that it would cease Orimulsion production, the company announced that it would go ahead with a plan to bring a 6.5 million mt/y Orimulsion plant online in a joint venture with CNPC. The project, dubbed Sinovensa, will supply Orimulsion to power plants in China. CNPC planned to complete the construction of two, 600-megawatt power plants in Zhanjiang by the end of 2006 that will consume 1.8 million mt/y of Orimulsion from the Sinovensa project.

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 some 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. There has been some discussion of Chinese oil firms providing financing for such a pipeline, but no solid plans have yet emerged.

Refining

PdVSA operates one of the largest refining networks in the Western Hemisphere.

According to *OGJ*, Venezuela has 1.28 million barrels per day (bbl/d) of crude oil refining capacity, all operated by PdVSA. The major facilities include the Paraguana Refining Center (955,000 bbl/d), Puerto de la Cruz (195,000 bbl/d), El Palito (126,900 bbl/d), and San Roque (5,200 bbl/d). PdVSA announced in August 2005 that it would spend \$5 billion to build three new refineries and upgrade two existing facilities, El Palito and Puerto la Cruz. According to Global Insight, Venezuela's refinery output is near full capacity.

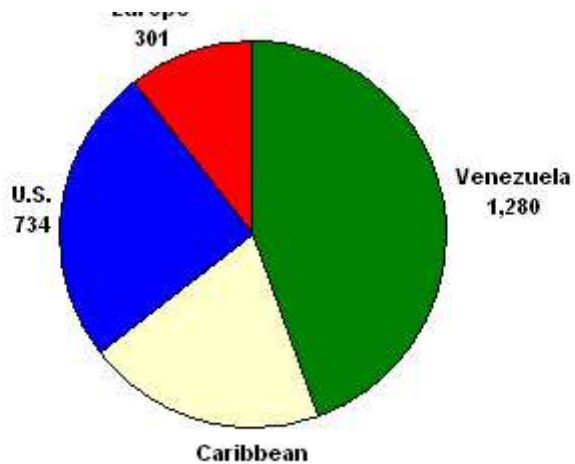
CITGO

CITGO, a wholly owned subsidiary of PdVSA, controls 734,000 bbl/d of crude oil refining capacity in the U.S. The company operates three product refiners (Lake Charles, LA; Corpus Christi, TX; Lemont, IL), two asphalt refineries (Paulsboro, NJ; Savannah, GA), and owns a 41 percent stake in Lyondell's Houston, TX refinery. CITGO also operates a network of 14,000 retail gasoline stations and numerous wholesale asphalt terminals. CITGO sources most of its crude oil under long-term contracts with PdVSA, though the Lemont facility receives most of its supply from Canada. 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.

In March 2004, CITGO announced that it plans to increase the crude processing capacity at the Lake Charles refinery to 450,000 bbl/d from the current 308,000 bbl/d, as part of the company's Tier II program. The expansion will include upgrades that will allow the refinery to process heavier crude streams from Venezuela.

PdVSA's Crude Oil Refining Capacity¹, by Region (thousand barrels per day)

Europe



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

*Includes direct operatorship and equity

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 had a capacity of 495,000 bbl/d in 2005. In the Netherlands Antilles, PdVSA leases the 320,000-bbl/d Emmastad refinery on the island of Curacao. Most of the products produced by these refineries are exported to the U.S.

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, 150,000-250,000-bbl/d refinery in the northeastern Brazil at a cost of \$2.5 billion. PdVSA has also pursued joint refinery investments in Colombia and Argentina.

Europe

PdVSA participates in two joint refining ventures in Europe, with the company controlling 300,500 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 250,000 bbl/d. Since December 2003, PdVSA has sought a buyer for its stake in Ruhr Oel. Most recently, it has negotiated with Lukoil about purchasing the stake, though BP holds the right of first refusal.

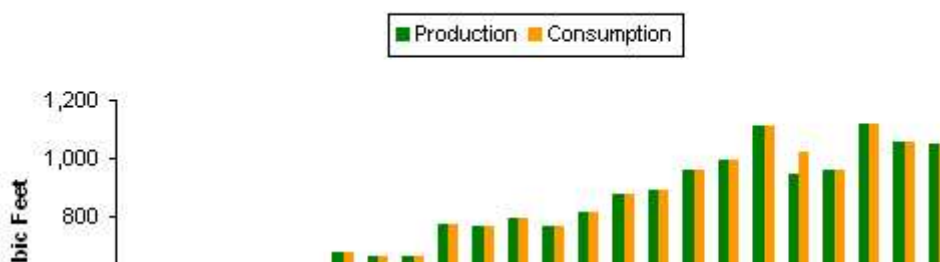
Natural Gas

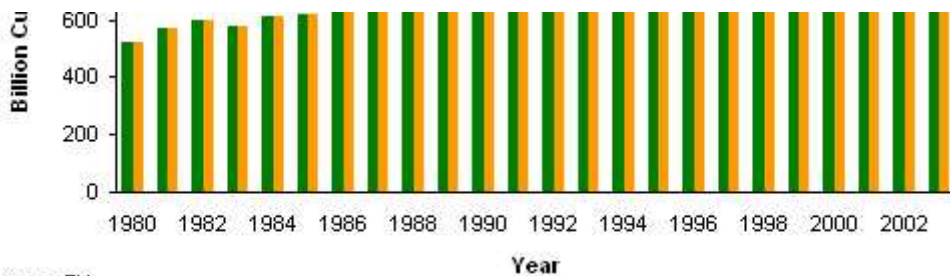
Venezuela has the second-largest natural gas reserves in the Western Hemisphere.

According to *Oil and Gas Journal*, Venezuela had 151 trillion cubic feet (Tcf) of proven natural gas reserves, the second largest in the Western Hemisphere (behind the United States) and the ninth largest in the world. In 2003, the country produced 1.05 Tcf of natural gas, while consuming the same amount. Crude oil production constrains natural gas production in Venezuela, as an estimated 90 percent of gas resources 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. Indeed, a shortage of natural gas in western Venezuela is one cause for declining crude oil production there, with Venezuela exploring imports from Colombia as a possible remedy (see below).

Venezuela's Natural Gas Production and Consumption, 1980-2003





Source: EIA

Sector Organization

The 1999 Gas Hydrocarbons Law allows foreign investors to own 100 percent of non-associated natural gas projects.

PdVSA has traditionally monopolized Venezuelan natural gas production. However, in the late 1990s, the Venezuelan government began to emphasize the opening and development of the natural gas sector. In 1999, the country adopted the Gas Hydrocarbons Law, which opened all aspects of the sector to private investment. The goals of the law included the development of natural gas resources, especially non-associated fields; expansion of domestic natural gas transport network and creation of a general distribution system; promotion of natural gas export projects; and increased consumption of natural gas by the power and petrochemical industries.

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, 20 percent and 30 percent, respectively are much lower than corresponding rates for oil projects.

Exploration and Production

In June 2001, PdVSA held its first non-associated natural gas licensing round for 11 exploration blocks, of which it awarded six. A consortium led by Total won the Yuca Placer Norte and Sur blocks, with other blocks awarded to Repsol-YPF, Pluspetrol, and Petrobras. In April 2004, Total began first production in the Yuca Placer blocks, with an initial output of 100 million cubic feet per day (MMcf/d). Through later stages of the project, Total planned to bring output up to 300 MMcf/d. The Yuca Placer blocks contain an estimated 1-2 Tcf of natural gas reserves.

Repsol-YPF announced in December 2004 that it had made a gas discovery in the Barrancas Block, in southwest Venezuela, which contains an estimated 2-6 Tcf of natural gas reserves. The first phase of the project, scheduled for completion in late 2005, will feed an 80-MW power station in Portuguesa, with a second stage to supply a 450-MW power station in Obispos by the end of 2006.

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. PdVSA estimates that Plataforma Deltana contains 40 Tcf of natural gas reserves. 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) that tested at 51 Mmcf/d. Statoil holds the exploration license for the Cocuina field (Block 4), and the company has contracted an exploratory rig for the field for 2005. However, the company ceased drilling in June 2005 due to safety concerns about the drilling equipment; as part of its license for the block, Statoil has agreed to drill at least three exploratory wells in four years.

PdVSA has had difficulty attracting interest in the remaining two blocks of Plataforma Deltana. It has twice offered Block 5, with no takers. The company has been in negotiations with BP over Block 1, also known as El Dorado, but there have been no firm commitments. 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. BP would like to develop El Dorado in conjunction with its nearby Cassia B platform in Trinidad and Tobago, which currently has spare capacity. Venezuela and Trinidad and Tobago began negotiations in 2004 to delineate cross-border reserves. In March 2005, the two countries signed a memorandum of understanding to export Venezuelan natural gas via Trinidad and Tobago's Atlantic LNG facility. On the other hand, Trinidad and Tobago refused to join Venezuela's Petrocaribe initiative in 2005.

Status of Major Venezuelan Natural Gas Projects

Name	Operator	Status	Notes
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Yucal Placer	Total	Producing 100 Mmcf/d	Planned expansion to 300 Mmcf/d
Barrancas	Repsol-YPF	First production late 2005	Will supply two power plants in southwestern region
Loran	Chevron	Exploration	Part of Plataforma Deltana
Lau-Lau	Chevron	Successful exploratory well in June 2005	Part of Plataforma Deltana
Cocuina	Statoil	Exploration	Part of Plataforma Deltana
Mariscal Sucre	PdVSA	Development	Might incorporate an LNG export terminal

Latest Licensing Round

PdVSA launched a new natural gas licensing round in 2005.

PdVSA held its latest natural gas licensing round in 2005. The round, dubbed the Rafael Urdaneta project, covered offshore acreage in the Gulf of Venezuela adjacent to Falcon state, with estimated reserves of 25 Tcf. PdVSA established the end of September as a deadline for companies to bid on six blocks. PdVSA plans to hold future licensing rounds for addition offshore exploratory blocks, including Blanquilla (10 Tcf of estimated reserves), Carupano (16 Tcf), and Bonaire (6 Tcf).

Pipelines

Domestic System

A lack of adequate domestic natural gas transport and distribution infrastructure has prevented Venezuela from fully exploiting its gas resources. In March 2004, PdVSA awarded three contracts to domestic companies for construction of the Central-Occidental Interconnection (ICO) pipeline. The 250-mile ICO will connect Venezuela's natural gas transport systems in the central and western parts of the country, supplying larger volumes of natural gas to western Venezuela for re-injection into oil fields. The first stage of the project will connect natural gas fields in Falcon state to the Paraguana refining complex, delivering 40-100 Mmcf/d. The second stage will connect the existing Ule-Amuay and Anaco-Barquisimeto pipelines. PdVSA announced that the ICO will begin operations in December 2005.

International Connections

In April 2003, Colombia and Venezuela agreed to build a \$130 million natural gas pipeline between the two countries. The two signed a formal agreement in October 2004 to begin construction of the 130-mile project in early 2005. The pipeline will carry 150 Mmcf/d from Colombia's gas fields in Punta Ballenas to Maracaibo in Venezuela, where PdVSA will use the natural gas for re-injection into its oil fields. However, the countries have stated that the flow of the pipeline might eventually reverse, once Venezuela has more fully developed its domestic natural gas reserves.

Liquefied Natural Gas (LNG)

In December 2002, PdVSA, Royal Dutch Shell, and Mitsubishi signed a preliminary agreement to develop the Mariscal Sucre LNG project, located on the Paria peninsula in northeastern Venezuela. The upstream component of the \$2.7 billion Mariscal Sucre consists of four offshore fields, Rio Caribe, Mejillones, Patao, and Dragon, with combined reserves of 10 Tcf and estimated production of around 1 billion cubic feet per day (Bcf/d). About 60 percent of this production would supply an LNG export terminal, with the rest going to the domestic market.

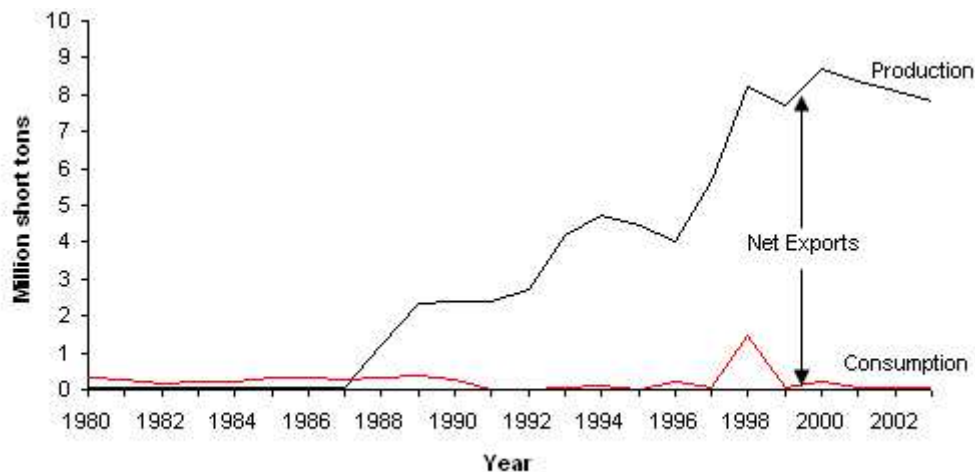
However, in August 2005, PdVSA announced that it would develop Mariscal Sucre itself and, for the time being, not go forward with the LNG export terminal. PdVSA will initially develop the Rio Caribe and Mejillones fields for the domestic market. However, PdVSA maintains that there are sufficient natural gas reserves to support an LNG export terminal in later stages, incorporating the Patao and Dragon fields. Any such terminal, though, would likely not start operations before 2009.

Coal

Venezuela exports almost all of its coal production.

Venezuela has recoverable coal reserves of approximately 528 million short tons (Mmst), most of which is bituminous. The country produced 7.85 Mmst of coal in 2003, while consuming only 0.06 Mmst. Most coal exports go to other countries in Latin America, but sizable amounts also go to the eastern United States and Europe.

Venezuela's Coal Production and Consumption 1980-2003



Source: EIA

Venezuela's coal sector is dominated by Carbozulia, a subsidiary of PdVSA. The company operates in partnerships with foreign companies. The Guasare Basin, near the Colombian border, is the major coal producing region in Venezuela.

Coal production has been limited during the last several years by infrastructure and transportation constraints, but there are plans for additional infrastructure investments to remove these obstacles. In 2005, Carbozulia formed a joint venture with Brazilian coal mining firm Companhia Vale do Rio Doce, dubbed Carosuramerica, to expand coal production in Venezuela to 10 Mmst by 2015. The plans include the construction of a railway linking coal mines to the coast (coal is currently carried via truck) and a new deepwater port.

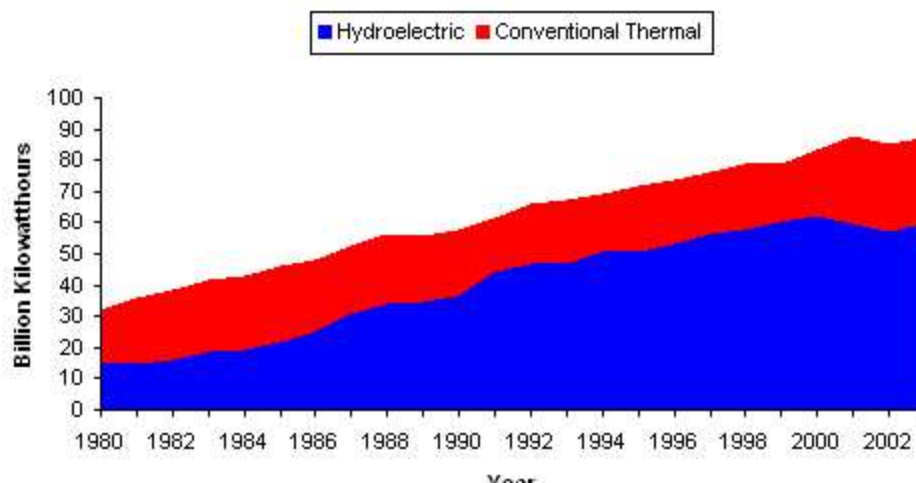
Electricity

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

As of January 2003, Venezuela had 21.3 gigawatts of installed generating capacity, of which 62 percent was hydroelectric, the remainder consisting of conventional thermal. In 2003, the country generated 87.4 billion kilowatthours (Bkwh) of electricity, while consuming 81.3 Bkwh. Electricity consumption in Venezuela has steadily risen over the past two decades, increasing by an average annual rate of 7.2 percent since 1980. Electricity consumption did post a small decrease in 2002-2003 due to recession. However, during the first seven months of 2005, electricity demand exceeded pre-recession levels.

Electricity disruptions and failures continue to be a problem in Venezuela. For example, the Oficina de Operacion de Sistema Interconectados (OPSIS), the principle government agency charged with regulating the electricity system, stated that there were 46 major power failures in the country during the first seven months of 2005, 70 percent more than the number of incidents recorded during the same period in 2004. One immediate reason for these failures is reduced hydropower production caused by below-average rainfall. Another is electricity theft, with illegal hookups accounting for an estimated 25 percent of Venezuela's total consumption.

**Venezuela's Electricity Generation, by Source
1980-2003**



Source: EIA

EIA

Sector Organization

The generating sector is open to private companies, but state-owned actors control the vast majority of installed capacity. The largest public company is Electrificación del Caroni (EDELCA), a subsidiary of the state-owned mining company Corporación Venezolana de Guayana (CVG); according to OPSIS, EDELCA controlled 65 percent of Venezuela's total generating capacity in 2004. Compañía Anónima de Administración y Fomento Eléctrico (CADAFE) is Venezuela's second-largest generating company, holding 18 percent of the country's generating capacity in 2004. The largest private sector generating company is La Electricidad de Caracas (EDC), majority-owned by US-based AES, which controlled 11 percent of Venezuela's generating capacity in 2004.

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 responsible for managing and operating Venezuela's national transmission grid.

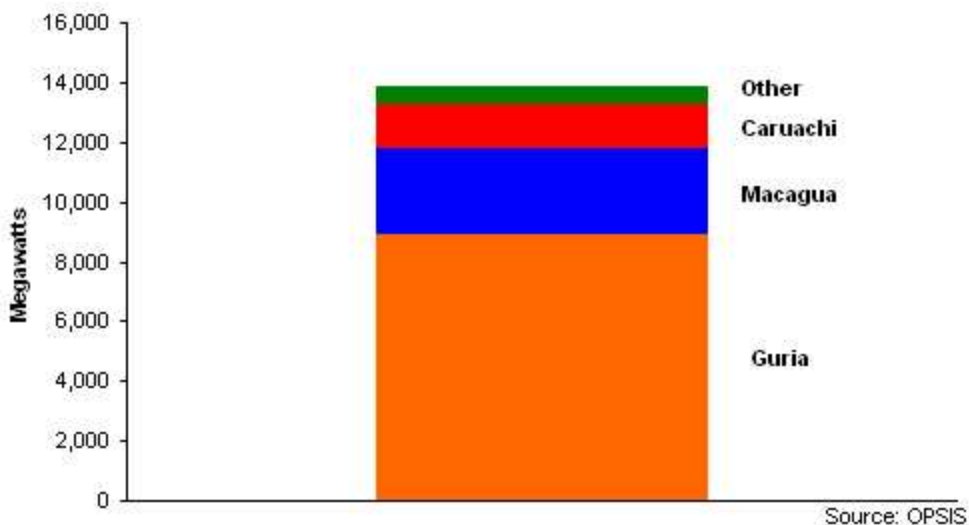
Privatization

Electric sector privatization was underway when the current administration came into power in 1998. In September 1999, the Electric Service Law (LSE), which provides a framework for the deregulation of the electric utility industry in Venezuela, was enacted. On December 14, 2000, the Ministry of Energy and Mines enacted the Electric Law Regulations pursuant to the LSE. The LSE required integrated electric companies to divide generation, transportation, distribution, and marketing assets into independent companies, which would operate autonomously by January 2003. However, the unstable political and economic situation in Venezuela over the past few years has indefinitely postponed further privatization of the electricity sector; recent plans call for generation and marketing to be deregulated and opened to competition, whereas distribution and transmission will remain regulated businesses.

Hydroelectricity

As mentioned above, 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 1,400-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. EDELCA also plans to expand the capacity of the Caruachi plant to 2,200 MW by 2006.

Capacities of Venezuela's Hydroelectric Facilities, 2004



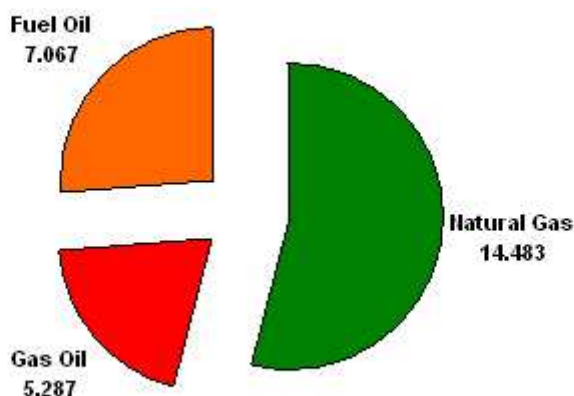
Conventional Thermal

Natural gas powers most conventional thermal electricity generation in Venezuela, fueling 54 percent of generation, according to OPSIS; fuel oil (26 percent) and gas oil (20 percent) provide

the remainder. EDC is the largest owner of conventional thermal capacity with 2,200 MW.

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.

Venezuela's Conventional Thermal Generation, by Fuel Type, 2004
(Billion kilowatthours)



Source: OPSIS

International Connectors

According to OPSIS, Venezuela had net electricity exports of 0.49 Bkwh in 2004, most of which was sent to Brazil via the Sana Elena/Boa Vista Interconnector. Venezuela also trades a small amount of electricity with Colombia via two links, the Cuatricentenario/Cuestecitas Interconnector and the El Corozo/San Mateo Interconnector.

Environment

Venezuela has the highest carbon intensity in Latin America.

Considering the long history of Venezuela's hydrocarbon industry and its present status as one of the world's top oil producers, it is no surprise that the country is a top emitter of carbon dioxide in Latin America. Venezuela's per capita CO₂ emissions in 2003 were 5.48 metric tons (MT), the highest in the region. Similarly, the oil-driven Venezuelan economy means the country has the highest rates of both energy and carbon intensity in the region, at 24,400 British thermal units (Btu) per dollar of GDP (2000,PP) and 1.18 MT of carbon dioxide per 1,000 dollars of GDP, respectively. Hydropower accounts for the bulk of Venezuela's electricity generation, but the country's use of other renewable energy sources as part of its energy consumption balance is tiny.

A number of Venezuela's environmental problems stem from its many years as a petroleum producer, although some issues, such as deforestation, are of more recent origin. The hydrocarbon industry is a major contributor to air pollution in Venezuela, and spills from oil development in the Maracaibo Basin have created water pollution problems.

Click [here](#) to view the full environmental report.

Profile

Country Overview

Location	Northern South America, bordering the Caribbean Sea and the North Atlantic Ocean, between Colombia and Guyana
Population (2005E)	25,375,281
Languages	Spanish (official), numerous indigenous dialects
Religion	nominally Roman Catholic 96%, Protestant 2%, other 2%
Currency	bolivar (VEB)
Inflation Rate (2004E)	22.4%

Gross Domestic Product (GDP, 2004E)	\$145.2 billion (purchasing power parity)
Real GDP Growth Rate (2004E)	16.8%
Exports (2004E)	\$35.8 billion f.o.b.
Imports (2004E)	\$15.0 billion f.o.b.

Energy Overview

Proven Oil Reserves (January 1, 2005E)	77.2 billion barrels
Oil Production (2004E)	2,855.7 thousand barrels per day, of which 88% was crude oil.
Oil Consumption (2004E)	544.1 thousand barrels per day
Proven Natural Gas Reserves (January 1, 2005E)	151 trillion cubic feet
Natural Gas Production (2003E)	1,048.9 billion cubic feet
Natural Gas Consumption (2003E)	1,048.9 billion cubic feet
Recoverable Coal Reserves (2003E)	528 million short tons
Coal Production (2003E)	7.8 million short tons
Coal Consumption (2003E)	0.1 million short tons
Electricity Installed Capacity (2003E)	20.6 gigawatts
Electricity Production (2003E)	87.4 billion kilowatt hours
Electricity Consumption (2003E)	81.3 billion kilowatt hours
Total Energy Consumption (2003E)	2.9 quadrillion Btus*, of which Oil (36%), Natural Gas (36%), Hydroelectricity (21%), Coal (0%), Nuclear (0%), Other Renewables (0%)
Total Per Capita Energy Consumption (2003E)	113.4 million Btus
Energy Intensity (2003E)	24,438.6 Btu per \$2000-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2003E)	140.9 million metric tons, of which Natural Gas (51%), Oil (49%), Coal (0%)
Per-Capita, Energy-Related Carbon Dioxide Emissions (2003E)	5.5 metric tons
Carbon Dioxide Intensity (2003E)	1.2 Metric tons per thousand \$2000-PPP**

Oil and Gas Industry

Organization	State-owned Petroleos de Venezuela, SA (PdVSA)
Major Foreign Oil Company Involvement	BP, ChevronTexaco, CNPC, ConocoPhillips, ExxonMobil, Repsol-YPF, Shell, Statoil, Total, Petro-Canada
Major Domestic Refineries (capacity, bbl/d)	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](#)
[EIA OPEC Fact Sheet](#)

U.S. Government

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[U.S. State Department's Consular Information Sheet - Venezuela](#)
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[Organization of American States \(OAS\)](#)

Foreign Government Agencies

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[Corporación Venezolana de Guayana](#)
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Electricity

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