

COUNTRY ANALYSIS BRIEFS

Brazil

Last Updated: August 2006

Background

Brazil is the largest country in South America and has experienced rapidly expanding oil, natural gas, and electricity markets in recent years.

The Brazilian economy is recovering from slow growth in the early parts of the decade, when real gross domestic product (GDP) growth averaged only 1.3 percent during 2001-2003. The economy grew by 4.9 percent in 2004 and, while slowing to 2.3 percent in 2005, forecasts predict growth of 3.5 percent in 2006. Keeping inflation in check has been a priority of Brazil's economic policy, which stood at 6.9 percent in 2005, a dramatic improvement from the hyperinflation seen in the 1990s. Another economic priority has been reducing public debt, and the government has registered primary budget surpluses of 3-4 percent in recent years.



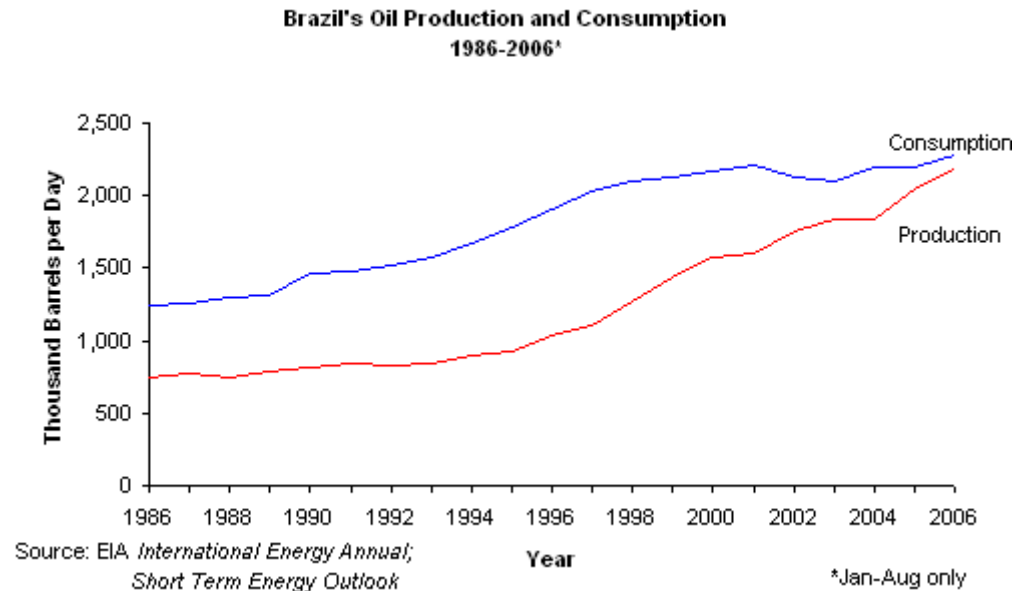
Brazil is the 10th largest energy consumer in the world and the third largest in the Western Hemisphere, behind the United States and Canada. Total primary energy consumption in Brazil has increased significantly in recent years. In addition, Brazil has made great strides over the past decade in increasing its total energy production, particularly with regards to oil. Increasing domestic oil production has been a long-term goal of the Brazilian government.

Oil

Overview

Brazil has the second-largest crude oil reserves in South America and is set to become a net oil exporter in 2006.

According to *Oil and Gas Journal (OGJ)*, Brazil had 11.2 billion barrels of proven oil reserves in 2006, second-largest in South America only to Venezuela. The offshore Campos and Santos Basins, located on the country's southeast coast, contain the vast majority of Brazil's proven reserves. During the first half of 2006, Brazil produced 2.1 million barrels per day (bbl/d) of oil, of which 82 percent was crude oil. Brazil's oil production has risen steadily in recent years, with the country's oil production in the first half of 2006 10 percent higher than the same period in 2005. As a result of its rising oil production, Brazil expects to become a net oil exporter by the end of 2006.



Despite market liberalization, Petrobras still controls over 90 percent of Brazil's crude oil production.

Sector Organization

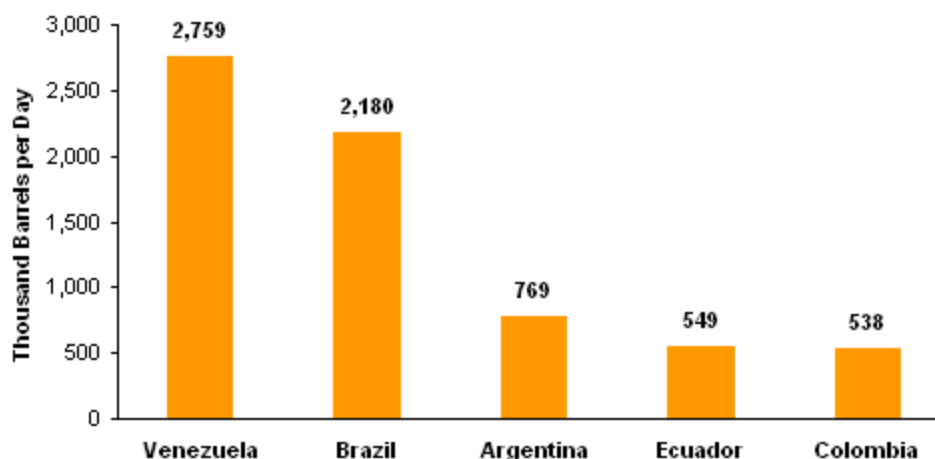
State-controlled Petrobras is the dominant player in Brazil's oil sector, holding majority positions in up-, mid-, and downstream activities. The company held a monopoly on oil-related activities in the country until 1997, when the government opened the sector to competition and freed oil prices from state control. The principal government agency charged with monitoring the oil sector is the National Petroleum Agency (ANP), which hold responsibility for issuing exploration and production licenses and ensuring compliance with relevant regulations.

Despite the opening of the sector to private actors in the late 1990s, foreign investment has been lackluster. Royal Dutch Shell is the only foreign operator of crude oil production in the country, operating a single, relatively small field in the Campos Basin. Some industry analysts have pointed to high federal and state taxes on oil production as the prime deterrent to foreign investment, but other concerns include poor exploratory drilling results and unattractive licensing terms from ANP. Nevertheless, ANP has stated that it wants to prioritize increased investment from domestic and foreign private oil producers, and Brazil does continue to attract attention from international oil companies. In November 2005, Norway's Norsk Hydro purchased a majority stake in the Chinook oil field from EnCana for \$350 million.

Exploration and Production

Petrobras controls over 95 percent of the crude oil production in Brazil. The largest oil-production region of the country is Rio de Janeiro state, which contains about 80 percent of Brazil's total production. Most of Brazil's crude oil production is offshore in very deep water and consists of mostly-heavy grades.

Petrobras has aggressively expanded production in recent years. In early 2006, it brought the Albacore Leste field online, which will eventually produce 180,000 bbl/d. Other 2006 production additions include expansion of the Golfinho field (100,000 bbl/d increase), Jubarte (60,000 bbl/d increase) fields, and new production at the Piranema field (20,000 bbl/d). In 2007, Petrobras expects to continue this expansion, bringing up to three additional projects on-stream: Rocandor P-52 (180,000 bbl/d), Rocandor P-54 (180,000 bbl/d), and Espadarte (100,000 bbl/d). However, in the past, Petrobras has faced difficulties developing new projects on schedule, mostly due to construction delays, rising costs, and shifting government regulations.

Top Five South American Oil Producers, Jan-August 2006

Source: EIA *Short Term Energy Outlook*

Shell's Bijupira-Salema project in the Campos Basin is the only oilfield in Brazil not operated by Petrobras. The project came on-stream in 2003 and produces 50,000 bbl/d. Shell also hopes to begin production at its BC-10 project (100,000 bbl/d) by the end of 2008. The next foreign operator planning to bring production online is Devon, which hopes to start production at the 50,000-bbl/d Polvo field in the middle of 2007. Chevron hopes to bring its Frade project (100,000 bbl/d) onstream by the end of 2008, while Norsk Hydro plans to begin production at its Chinook field (60,000 bbl/d) by 2010. However, despite these potential new projects, Petrobras will remain the dominant oil producer in Brazil for the foreseeable future.

Recent and Planned New Crude Oil Projects in Brazil			
<i>Name</i>	<i>Operator</i>	<i>Scheduled Start Date</i>	<i>Peak Production (bbl/d)</i>
Albacora Leste	Petrobras	April 2006	180,000
Golfinho Mod 1	Petrobras	May 2006	100,000
Piranema	Petrobras	October 2006	20,000
Jubarte I	Petrobras	September 2007	60,000
Polvo	Devon Energy	July 2007	50,000
Roncador P-52	Petrobras	4Q2007	180,000
Roncador P-54	Petrobras	4Q2007	180,000
Espadarte RJS-409	Petrobras	4Q2007	100,000
Golfinho Mod II	Petrobras	3Q2008	100,000
Marlim Sul Mod 2 P-51	Petrobras	4Q2008	180,000
Frade	Chevron	4Q2008	100,000
BC-10	Royal Dutch Shell	2Q2009	100,000
Golfinho Mod III	Petrobras	1Q2010	100,000
Jubarte II P-57	Petrobras	2Q2010	120,000
Chinook	Norsk Hydro	2Q2010	60,000

Licensing Rounds

Since opening up its oil industry in 1997, Brazil has held seven licensing rounds. The fifth round, in August 2003, did not attract any interest from oil companies other than Petrobras. The sixth round, in August 2004, saw 154 blocks sold and raised a record amount of money in licensing fees. However, the majority of the most-promising blocks went to Petrobras. Further, most major foreign investors, such as Shell, BP, and EnCana, avoided direct operatorship of new licenses,

instead buying stakes in projects operated by Petrobras. Brazil held its seventh licensing round in October 2005, with ANP reporting that a record 144 companies placed bids on 1,134 blocks. Highlights of the auction included a \$72 million bid by Petrobras and BG Group for the S-M-508 deepwater block in the Santos Basin. Deepwater, gas-prone blocks attracted the most attention and, as was the case in the sixth round, most foreign companies preferred to take minority stakes in Petrobras-operated projects, rather than taking operatorship themselves.

Pipelines

Transpetro, a wholly owned subsidiary of Petrobras, operates Brazil's crude oil transport network. The system consists of 4,000 miles of crude oil pipelines, coastal import terminals, and inland storage facilities. The overall structure of the network enables the movement of crude oil from coastal production facilities and import terminals to inland refineries and consumption centers.

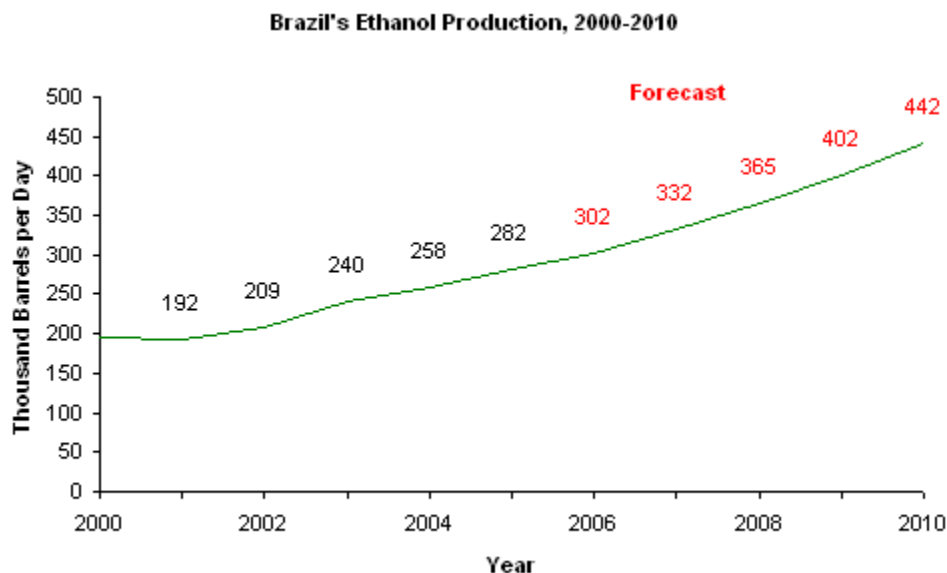
Downstream

According to OGJ, Brazil has 1.9 million bbl/d of crude oil refining capacity spread amongst 13 refineries. Petrobras operates 11 facilities, the largest being the 360,000-bbl/d Paulinia refinery in Sao Paulo. The company plans to spend \$9 billion to upgrade its facilities to better process heavy domestic crude stream and producer lower-sulfur diesel fuel. Petrobras also controls a dominant stake in the retail products market.

Petrobras announced in March 2006 that it would build a new, \$3.5 billion, 150,000-bbl/d refinery in Rio de Janeiro. The refinery, which will produce basic petrochemicals, will have special facilities to facilitate the processing of Brazil's heavy domestic crude varieties. In February 2005, Petrobras signed an agreement with Venezuela's state-owned Petroleos de Venezuela S.A. (PdVSA) to build a new, 150,000-250,000-bbl/d refinery in the northeastern Brazil at a cost of \$2.5 billion. The companies expect to complete the facility by 2010, with each country providing half of the crude oil processed there.

Ethanol

Brazil is the largest producer and exporter of ethanol in the world, producing 282,000 bbl/d in 2005. Over half of all cars in the country are of the flex-fuel variety, meaning that they can run on 100 percent ethanol or an ethanol-gasoline mixture. Ethanol in Brazil comes from sugar cane, which prospers in the country's tropical climate. Coimex Trading, a subsidiary of Brazilian conglomerate Grupo Coimex, is the largest producer of ethanol in Brazil.



Source: Brazil Ministry of Agriculture; EIA *Short Term Energy Outlook*; internal EIA estimates

In recent years, Brazil has sought to increase ethanol exports, especially to the United States. In 2005, Brazil exported 7,200 bbl/d of ethanol to the United States. To help facilitate additional exports, Petrobras announced a plan in early 2006 to build an ethanol pipeline from Goias, an interior area at the center of Brazil's sugarcane production, to Sao Paulo. However, surging

domestic demand, high domestic prices. In addition, Brazil's ethanol exports face high tariffs in some markets, such as the 54 cent per gallon tariff in the United States.

Natural Gas

Natural gas constitutes only a small portion of Brazil's total energy consumption.

OGJ reported that Brazil had 11.5 trillion cubic feet (Tcf) of proven natural gas reserves in 2006. The Campos and Santos Basins hold the majority of reserves, but there are also sizable reserves in the interior stretches of the country. Despite Brazil's sizable natural gas reserves, natural gas production has grown slowly in recent years, mainly due to a lack of domestic transportation capacity and partly due to low domestic prices. In the future, Brazil hopes to that increased development of increase natural gas production through an expansion of the domestic natural gas transport network, ending flaring at oil-producing facilities, and increased development of existing reserves.

Natural gas consumption is a small part of the country's overall energy mix, constituting only 7 percent of total energy consumption in 2004. High oil prices have helped spur natural gas demand in Brazil: natural gas is mostly used as a substitute for fuel oil in industrial and power-generating applications, and domestic prices for natural gas are much lower than international fuel oil prices. Further, the introduction of natural gas imports has lead to a rapid growth in domestic consumption.

Sector Organization

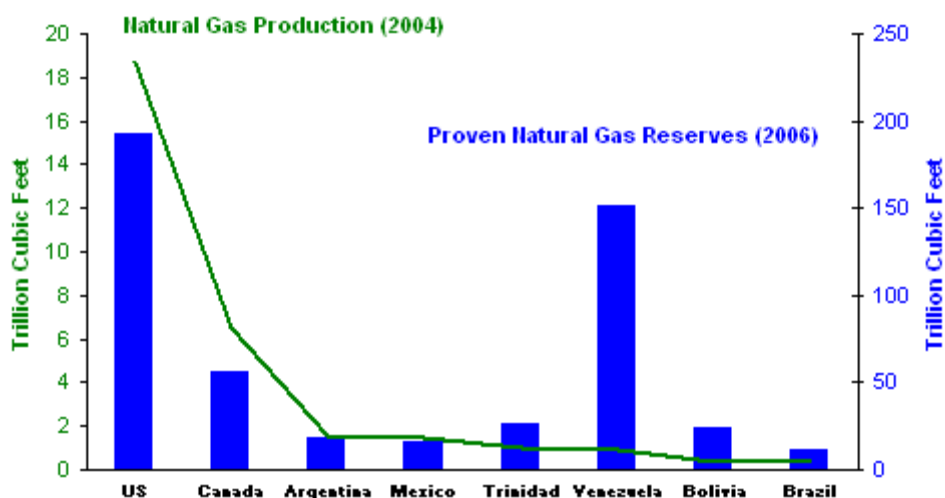
Petrobras is the largest producer of natural gas in Brazil. The company reportedly controls over 90 percent of Brazil's natural gas reserves. Other important actors in the sector include Sulgas and Britain's BG. ANP has sought to attract international investment to the sector, and its seventh licensing round (see [above](#)) emphasized blocks thought to contain commercial quantities of natural gas.

Petrobras is also the largest wholesale supplier of natural gas. Brazilian law allows each state to maintain a monopoly on natural gas distribution in their respective territory, but many states have begun to partially privatize these distribution companies. Petrobras has bought stakes in several of these companies. The industrial sector is the largest consumer of natural gas in Brazil, representing about 80 percent of total domestic consumption. However, the two fastest growing sectors are thermal electricity generation and vehicular compressed natural gas (CNG).

Exploration and Production

In 2004, Brazil produced 340 billion cubic feet (Bcf) of natural gas. Brazil's largest natural gas production occurs in the Campos Basin in Rio de Janeiro state from offshore fields. Most onshore production occurs in Amazonas and Bahia states, though natural gas produced here is mostly for local consumption due to the lack of transportation infrastructure. However, several new transport infrastructure projects hope to facilitate increased production in these regions.

Top Western Hemisphere Natural Gas Producers, 2004



Source: EIA, *International Energy Annual*; *Oil and Gas Journal*

In 2006, Petrobras announced an ambitious plan to increase its natural gas production to 520 Bcf by the end of 2008. The project would focus on increasing production from the existing Marlim and Merluza fields and bring two new fields onstream in Espirito Santo state.

Pipelines

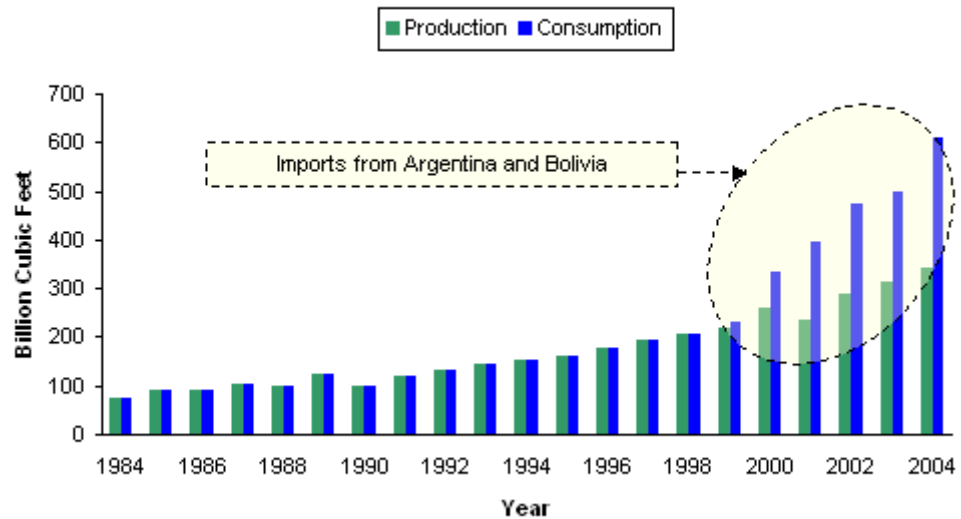
Petrobras operates Brazil's domestic natural gas transport system. The network has over 1,550 miles of natural gas pipelines, mostly in the southeast and northeast parts of the country. The network consists of main systems in the southeast, northeast, and the state of Espirito Santo; these systems are not currently interconnected, which has hindered development of domestic production and consumption. In June 2006, China's Sinopec began construction on the 730-mile Gasene pipeline linking the northeast and southeast networks. In 2005, construction began on the Gas Unificacao, or Gasun; the 1,400-mile Gasun will link Mato Grosso do Sul, in southwest Brazil, to Maranhao, in the northeast. These pipeline projects fulfill an objective the Brazilian government announced in June 2003 to expand the country's natural gas pipeline network.

Most of Brazil's inland natural gas reserves are unexploited due to a lack of transportation capacity.

A lack of natural gas transportation infrastructure in the interior regions of the country has hindered exploration and production. In particular, Amazonas state contains considerable reserves that remain unexploited, especially the Urucu field, which contains Brazil's largest onshore natural gas reserves. In 2005, Petrobras began construction of the Urucu pipeline that will link Urucu to Manaus, the capital of Amazonas state. The project includes construction of a new, 240-mile pipeline from Manaus to Coari, where it will interface with an existing liquefied petroleum gas (LPG) pipeline that Petrobras will convert to transport natural gas. The Urucu pipeline will parallel an existing oil pipeline and carry natural gas that is currently re-injected or flared off during oil production. Petrobras also plans to build a pipeline from Urucu to Porto Velho, capital of Rondonia state, with construction scheduled to begin in 2007.

Import Pipelines

Brazil imports natural gas from Bolivia via the Gasbol pipeline linking Santa Cruz, Bolivia to Porto Alegre, Brazil, via Sao Paulo. The 2,000-mile Gasbol has a maximum capacity of 1 Bcf per day (Bcf/d), though utilization in the first quarter of 2006 was only 840 million cubic feet per day (Mmcf/d). Gasbol also has a 170-mile, 100-Mmcf/d extension that connects to a natural gas-fired power plant in Cuibana.

Brazil's Natural Gas Production and Consumption, 1984-2004

Source: EIA *International Energy Annual*

Gasbol has been a recurring source of contention between Brazil and Bolivia. The agreement between the two countries is a take-or-pay contract, meaning that Brazil often must pay for natural gas that it does not actually use. There have been times in the past when, due to dampened economic growth, Brazil has not been able to use the entire volume. In addition, Bolivia has objected to the low price that Brazil pays for natural gas from the Gasbol system, which averaged \$3.60 per cubic foot during the first quarter of 2006, well below international levels.

Despite these issues, Petrobras announced in January 2005 that it would like to increase the capacity of the Gasbol pipeline, due to surging natural gas demand in Brazil from resumed economic growth in the country. However, the completion of this expansion is now uncertain. In May 2006, Petrobras reportedly canceled the expansion plans, stating that potential customers had withdrawn their commitments to purchase the increased supplies. In addition, Bolivia's nationalization of its upstream oil and natural gas industries in May 2006, and its desire to double the price that Brazil pays for natural gas imports, cast doubt upon the fate of the project.

Brazil also receives natural gas from Argentina via the Parana-Uruguayana pipeline. The 275-mile, 100-Mmcf/d pipeline supplies a gas-fired power plant operated by AES. There is a 380-mile extension of the pipeline under construction that will link Uruguayana to Porto Alegre. Finally, the operators of the Southern Cross pipeline, currently linking Buenos Aires to Montevideo, hold a concession to extend the pipeline to Porto Alegre.

Brazil has held talks with Venezuela and Argentina about building a new, 5,000-mile natural gas pipeline system linking the three countries, called the Gasoducto del Sur. The system, which would facilitate exports from Venezuela to the other two, could cost at least \$20 billion. The plan, however, has not moved beyond the planning stages: factors that could undermine the project's feasibility include its high cost, disagreements about pricing, and questions about the availability of Venezuelan natural gas production to supply the system.

Coal

Brazil has the second-largest coal reserves in the Western Hemisphere.

In 2003, Brazil had 11.1 billion short tons of recoverable coal reserves, the second largest in the Western Hemisphere, behind the United States. The country consumed 23.5 million short tons (Mmst) and produced 6.2 Mmst in 2004. Brazil's coal reserves have high ash and sulfur contents, with low caloric values, which explains the low level of domestic production. Brazil imports coal for steel-making and uses domestic reserves for power generation, mainly from the United States and Australia.

Brazil is attempting to reverse its status as a net importer of coal. According to reports, Brazil's national development bank, Banco Nacional de Desenvolvimento Economico e Social (BNDES),

is developing a plan to expand the country's coal industry. BNDES hopes that the proposed program will make Brazil self-sufficient in coal by 2010 and eventually a net exporter of coal.

Electricity

Brazil has the third-largest electricity sector in the Western Hemisphere.

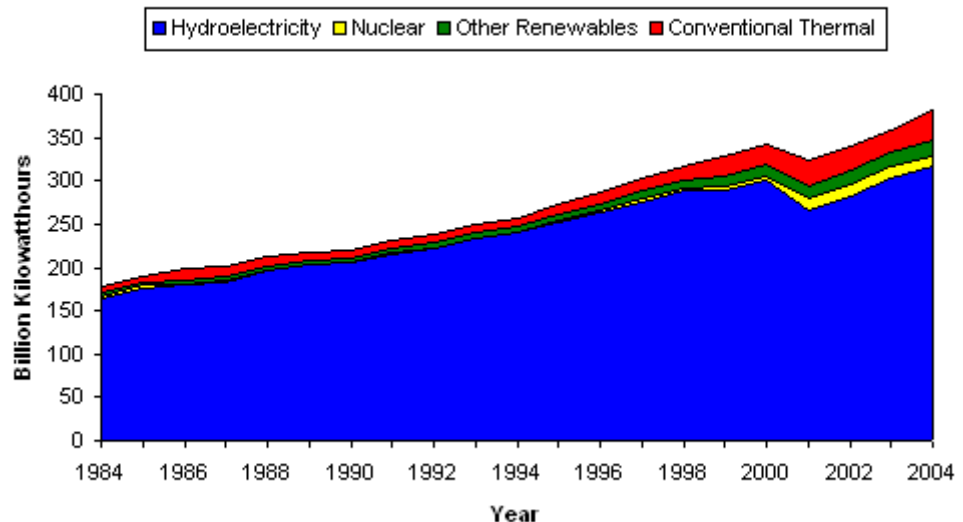
Brazil had 86.5 gigawatts of installed generating capacity in 2004, with the single largest share being hydroelectricity. In 2004, the country generated 380.9 billion kilowatthours (Bkwh) of electric power, while consuming 391.7 Bkwh. Most imported electricity comes from Argentina.

Sector Organization

The Brazilian government began to restructure the electricity sector in the mid-1990s, with the creation of a new regulatory agency, ANEEL. The government also established a national transmission grid operator, Operado Nacional do Sistema Elctrica (ONS), and a wholesale power market, the Mercado Atacadista de Energia Elctrica. However, privatization of the state-owned generating assets stalled. Therefore, state-owned Electrobras is the largest generating company in Brazil, controlling over half of total installed capacity. Other state-owned companies control most of the remaining capacity. The largest private generating company is Tractebel Energia, a subsidiary of France's Suez. While state-owned companies still control most generating and transmission assets, distribution is largely in private hands.

There are an estimated 64 electricity distribution companies in Brazil. The country's constitution gives state governments a monopoly on their electricity markets, though many have begun to privatize these markets. ONS operates the national transmission grid, which consists of two large grids (one in the north, one in the southeast) and numerous smaller systems in isolated regions. ONS connected the north and southeast grids in 1999, and the combined system covers over 90 percent of Brazil's electricity market. In total, Brazil's high voltage (greater than 230kV) distribution network contains some 40,000 miles of transmission lines.

Brazil's Electricity Generation, by Source, 1984-2004

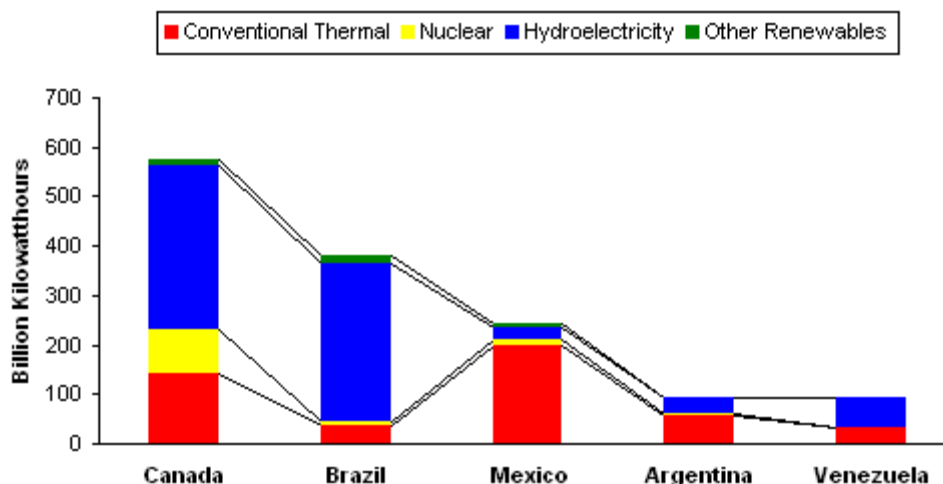


Source: EIA, *International Energy Annual*

In cooperation with Paraguay, Brazil operates the Itaipu hydroelectricity complex, one of the largest in the world.

Hydroelectricity

Brazil generated 380.9 Bkwh of hydroelectric power in 2004, or 83 percent of its total electricity supply for that year. Together with Paraguay, Brazil maintains the world's largest operational hydroelectric complex, the Itaipu facility on the Parana River, with a capacity of 12.6 GW (the Three Gorges Dam in China facility will be larger, when it is completed). Many of Brazil's hydropower generating facilities are located far away from the main demand centers, resulting in high transmission and distribution losses, estimated at around 16 percent of total domestic supply.

Top* Western Hemisphere Electricity Generators, by Source, 2004Source: EIA, *International Energy Annual*

*excluding United States (to maintain scale)

Brazil's heavy reliance on hydroelectricity has caused problems in the past, especially during years of below-average rainfall. In 2001, Brazil faced a critical electricity shortage due to insufficient rainfall and years of limited investment in the country's power sector. During the 1990s, power demand, because of a growing economy and a rising standard of living, had been consistently outstripping increments in generation capacity. In 2000, electricity consumption was about 58 percent higher than it was in 1990, while installed generation capacity grew about 32 percent during the same period. Analysts had long predicted that this demand growth, if not supported by capacity growth, had the potential to lead to shortages. In June 2001, the government implemented a temporary energy-rationing program, which prevented rolling blackouts by requiring customers in the Northeast, Southeast and Midwest regions to reduce consumption by varied percentages.

Conventional Thermal

Conventional thermal generating sources provided only a small part of Brazil's electricity supply. According to ANP, Brazil had 7,000 MW of installed, natural gas-fired electricity generating capacity in 2004, providing around 4 percent of Brazil's electricity supply that year.

Petorbras estimates that natural-gas fired generating capacity in Brazil could increase to 13,000 MW by 2017. However, Current President da Silva has indicated that his administration supports the expansion of hydropower projects, in spite of the 2002 power crisis, so the future status of natural gas-fired generation capacity in the country is in doubt. In addition, questions about the future availability of Bolivian natural gas imports could also hinder investment in new capacity.

Nuclear Power

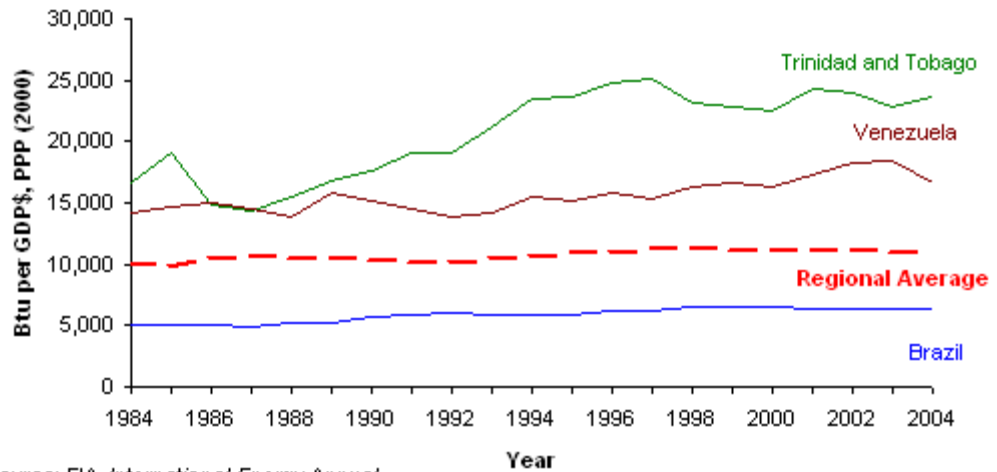
Brazil has two nuclear power plants, the 630-megawatt (MW) Angra-1 and the 1,350-MW Angra-2. State-owned Eletronuclear, a subsidiary of Eletrobras, operates both plants. A third, 1,350-MW plant, Angra-3, remains partially constructed. A lack of funds and political support have delayed completion of Angra-3, but the Brazilian government announced that it would make an ultimate decision about the plant before the end of 2006.

Environment

Brazil is an important player in discussions concerning international environmental issues, as the country contains over 30 percent of the world's tropical rainforests. In addition to providing shelter to at least one tenth of the world's plant and animal species, the rainforest acts as a mechanism for absorbing carbon dioxide from the atmosphere.

Brazil has low energy and carbon dioxide intensities compared to the regional average.

**Energy Intensity of Selected Latin American Countries
1984-2004**



Source: EIA, *International Energy Annual*

Brazil is the largest energy consumer in South America, with 9.1 quadrillion Btu of total energy consumption in 2004. While total energy consumption is high for the region, Brazil's per capita energy consumption and energy intensity are comparable to the regional average. Brazil also is the largest emitter of carbon dioxide in the region, releasing 336.7 million metric tons of carbon dioxide in 2004. Again, despite the high absolute amount of emissions, Brazil's carbon intensity is comparatively low.

Profile

Country Overview

Chief of State	President Luiz Inacio Lula Da Silva (since January 2003)
Location	Eastern South America, bordering the Atlantic Ocean
Independence	7 September 1822 (from Portugal)
Population (2005E)	186,112,794 note: Brazil took a count in August 2000, which reported a population of 169,799,170; that figure was about 3.3% lower than projections by the US Census Bureau, and is close to the implied underenumeration of 4.6% for the 1991 census; estimates for this country explicitly take into account the effects of excess mortality due to AIDS; this can result in lower life expectancy, higher infant mortality and death rates, lower population and growth rates, and changes in the distribution of population by age and sex than would otherwise be expected.

Economic Overview

Currency/Exchange Rate (8/10/06)	1 Brazil Reais (BRL) = \$0.46
Inflation Rate (2004E, 2005E, 2006F)	6.6%, 6.9%, 4.4%
Gross Domestic Product (GDP, 2005E)	\$800 billion
Real GDP Growth Rate (2004E, 2005E, 2006F)	4.9%, 2.3%, 3.5%
Unemployment Rate (2005E)	9.8%
External Debt (2005E)	\$190 billion
Exports (2005E)	\$120 billion
Exports - Commodities	transport equipment, iron ore, soybeans, footwear, coffee, autos

Exports - Partners (2004E)	US 21.2%, China 7.8%, Argentina 6%, Germany 5.1%, Netherlands 4.8%
Imports (2005E)	\$70 billion
Imports - Commodities	machinery, electrical and transport equipment, chemical products, oil
Imports - Partners (2004E)	US 22.4%, Germany 9.2%, Argentina 8.1%, China 5.5%
Current Account Balance (2005E)	\$14 billion

Energy Overview

Proven Oil Reserves (January 1, 2006E)	11.2 billion barrels
Oil Production (2006E)	2,094 thousand barrels per day, of which 82% was crude oil.
Oil Consumption (2005E)	2,191.9 thousand barrels per day
Crude Oil Distillation Capacity (2006E)	1,908.3 thousand barrels per day
Proven Natural Gas Reserves (January 1, 2006E)	11.5 trillion cubic feet
Natural Gas Production (2004E)	340 billion cubic feet
Natural Gas Consumption (2004E)	610 billion cubic feet
Recoverable Coal Reserves (2003E)	11,147.7 million short tons
Coal Production (2004E)	6.2 million short tons
Coal Consumption (2004E)	23.5 million short tons
Electricity Installed Capacity (2004E)	86.5 gigawatts
Electricity Production (2004E)	380.9 billion kilowatt hours
Electricity Consumption (2004E)	391.7 billion kilowatt hours
Total Energy Consumption (2004E)	9.1 quadrillion Btus*, of which Oil (48%), Hydroelectricity (35%), Natural Gas (7%), Coal (5%), Other Renewables (2%), Nuclear (1%)
Total Per Capita Energy Consumption (2003E)	49.5 million Btus
Energy Intensity (2004E)	6,279.2 Btu per \$2000-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2003E)	351.5 million metric tons, of which Oil (77%), Coal (13%), Natural Gas (10%)
Per-Capita, Energy-Related Carbon Dioxide Emissions (2003E)	2 metric tons
Carbon Dioxide Intensity (2004E)	0.2 Metric tons per thousand \$2000-PPP**
Environmental Issues	deforestation in Amazon Basin destroys the habitat and endangers a multitude of plant and animal species indigenous to the area; there is a lucrative illegal wildlife trade; air and water pollution in Rio de Janeiro, Sao Paulo, and several other large cities; land degradation and water pollution caused by improper mining activities; wetland degradation; severe oil spills
Major Environmental Agreements	party to: Antarctic-Environmental Protocol, Antarctic-Marine Living Resources, Antarctic Seals, Antarctic Treaty, Biodiversity, Climate Change, Climate Change-Kyoto Protocol,

Desertification, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands, Whaling signed, but not ratified: none of the selected agreements

Oil and Gas Industry

Organization	Petrobras: government-owned (majority shareholder) oil and natural gas company; Royal Dutch Shell.
Major Oil/Gas Ports	Sao Sebastiao, Paranagua, Salvador, Tramandai, Sao Francisco do Sul, Aracaju, Maceio, Recife, Natal, Fortaleza, Belem
Major Oil and Natural Gas Basins	Campos Basin, Santos Basin
Major Refineries (capacity, bbl/d)	Paulinia-Sao Paulo (350,000), Mataripe-Bahia (293,700), Duque de Caxias-Rio de Janeiro (232,2000), Sao Jose dos Campos-Sao Paulo (241,500), Canoas-Rio Grande do Sul (180,900), Araucaria-Parana (180,900), Cubatao-Sao Paulo (162,900), Betim Minas Gerais (144,800)

* 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 - Historical Energy Data on Brazil](#)

U.S. Government

[CIA World Factbook - Brazil](#)

[U.S Embassy in Brazil](#)

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

[U.S. State Department's Background Notes on Brazil](#)

Associations and Institutions

[Associação Brasileira das Empresas Distribuidoras de Gás Canalizado \(Association for Gas Distributors\)](#)

[Brazilian Petroleum Institute](#)

[National Organization of t](#)

[The Baker Institute Energy Forum \(various papers on Brazil's energy sector\)](#)

[The Brazilian Association of Electric Energy Independent Producers](#)

Foreign Government Agencies

[Agência Nacional de Energia Elétrica](#)

[Agência Nacional do Petróleo \(ANP\) \(National Petroleum Agency\)](#)

[Ministério de Minas e Energia \(MME\) \(Ministry of Mines and Energy\)](#)

Oil and Natural Gas

[Aker Kvaerner ASA](#)

[ALGAS \(Alagoas state\)](#)

[BR Distribuidora](#)

[CEG \(Rio de Janeiro state\)](#)

[CEGAS \(Ceará state\)](#)

[COMGAS \(São Paulo state\)](#)

[COMPAGAS \(Paraná state\)](#)

[COPERGAS \(Pernambuco state\)](#)

[GásEnergia](#)

[GASMIG \(Minas Gerais state\)](#)

[Ipiranga SA](#)

[Manguinhos SA](#)

[PBGAS \(Paraíba state\)](#)

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Electricity

[Centrais Elétricas do Norte do Brasil \(Eletronorte\)](#)

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[Furnas](#)

[Itaipu Hydroelectric Dam](#)

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