

## COUNTRY ANALYSIS BRIEFS

# Bolivia

Last Updated: October 2006

***With one of the largest natural gas reserves in South America, Bolivia has the potential to become a natural gas hub in the Southern Cone.***

### Background

Bolivia is one of the poorest countries in South America, with a 2005 per-capita gross domestic product of \$1,019. Following sub-par economic growth from 1999 to 2002, Bolivia's economy has performed better in recent years, posting real GDP growth of 4.1 percent in 2004 and 2005. The country's most important exports are natural gas, minerals, and agricultural products.



Bolivia has the second-largest proven natural gas reserves in South America, behind Venezuela (see [chart](#) in Natural Gas section). Rising earnings from natural gas exports have been an important driver of Bolivia's economic growth. In February 2006, Evo Morales won Bolivia's presidential election and has embarked on a campaign of resource nationalism, including the renationalization of all hydrocarbon resources and the renegotiation of export contracts with Argentina and Brazil. The impact of this campaign is unclear: in the short-term, Bolivia has been able to secure higher prices for its natural gas exports, but the nationalization has reportedly deterred foreign investment in the sector; in addition, the long-term effects of the move remain to be seen.

### Oil

***Bolivia meets most of its oil demand through domestic production.***

According to *Oil and Gas Journal* (OGJ), Bolivia had proven crude oil reserves of 440 million barrels in 2006. Greater exploration activity and investment by oil companies in Bolivia have rapidly increased the country's proven oil reserves; according to Bolivia's state-owned Yacimientos Petroliferos Fiscales Bolivianos (YPFB), the country only had 116 million barrels of proven oil reserves in 1997. The Tarija department, located in southwestern Bolivia, contains over 80 percent of the country's total reserves.

### Sector Organization

Bolivia privatized its oil sector in the mid-1990s. Formally state-owned oil company YPFB divested most of its assets, though the company retained responsibility for negotiating and monitoring contracts with foreign oil companies. Principal regulatory authority over the oil sector

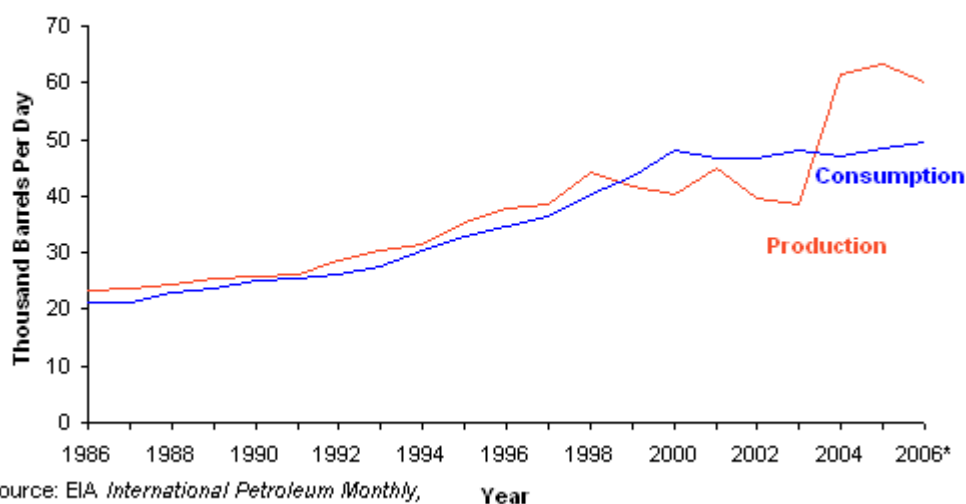
belongs to the Hydrocarbons Superintendent, which also regulates the natural gas sector. Transredes, majority-owned by Royal Dutch Shell and Prisma Energy, operates the oil pipeline network.

Following the privatization, foreign companies took control over the bulk of Bolivia's oil sector. The largest such companies included Petrobras and Repsol-YPF. In May 2006, the Bolivian government announced the re-nationalization of the country's hydrocarbon reserves, effectively giving control of oil reserves back to YPFB. The government established a November 1, 2006 deadline for private oil companies to negotiate new agreements with YPFB. However, due to implementation difficulties, the deadline has been delayed.

### Exploration and Production

According to EIA estimates, Bolivia produced 64,000 barrels per day (bbl/d) of oil (including crude oil, condensates, natural gas liquids, and refinery gain) during the first three-quarters of 2006, unchanged from the same period during 2005. Petrobras is the largest producer in the country, followed by Repsol-YPF. Bolivia consumed about 48,000 bbl/d of oil in 2006, making it largely self-sufficient in oil.

**Bolivia's Oil Production and Consumption, 1986-2006\***



Source: EIA, *International Petroleum Monthly*,  
*Short Term Energy Outlook*

Year

\*Jan-October only

### Pipelines

Transredes operates Bolivia's domestic oil transportation network. The 430-mile Northern System transports crude oil and condensates from Carrasco to the cities of Santa Cruz and Cochabamba. The 610-mile Southern System connects Yacuiba to Santa Cruz, carrying crude oil and liquefied petroleum gas (LPG). The 310-mile Central System links Santa Cruz with Cochabamba.

#### International Pipelines

Transredes operates a small, 18,000-bbl/d crude oil pipeline between Cochabamba and Arica, Chile. The pipeline operates only occasionally.

### Downstream

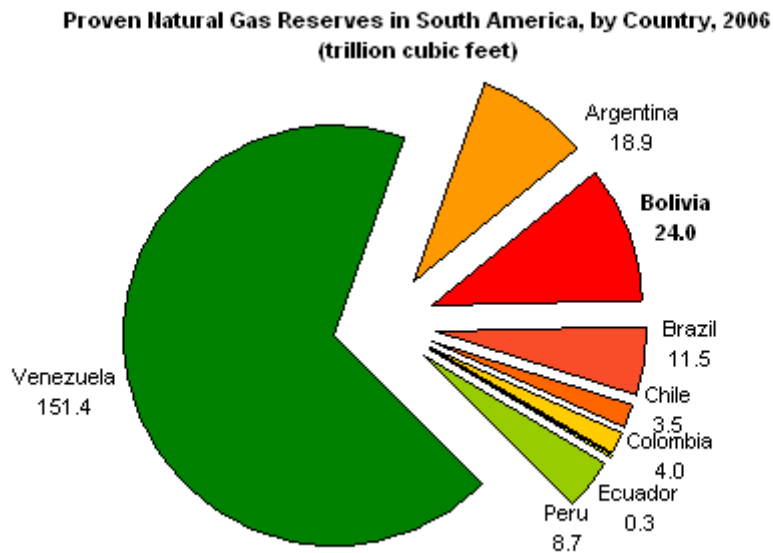
According to OGJ, Bolivia had 47,250 bbl/d of crude oil refining capacity in 2006. The country has two refineries, both operated by Petrobras. These refineries entirely meet the country's demand for gasoline and jet fuel. However, the country still must import some petroleum products, especially diesel, due to a lack of suitable domestic refining capacity. In addition, Petrobras also reportedly exports some of the products from the plants. According to the May 2006 nationalization decree, YPFB must obtain a majority stake in these two refineries, though it has yet to implement this plan.

## Natural Gas

**Bolivia has the**

**second-largest natural gas reserves in South America, after Venezuela.**

According to *Oil and Gas Journal (OGJ)*, Bolivia had proven natural gas reserves of 24.0 trillion cubic feet (Tcf) in 2006. YPFB gives a slightly higher figure for 2005 proven natural gas reserves of 26.7 Tcf. Tarija department contains over 85 percent of the country's total reserves, followed by Santa Cruz department (10.6 percent) and Cochabamba department (2.5 percent).



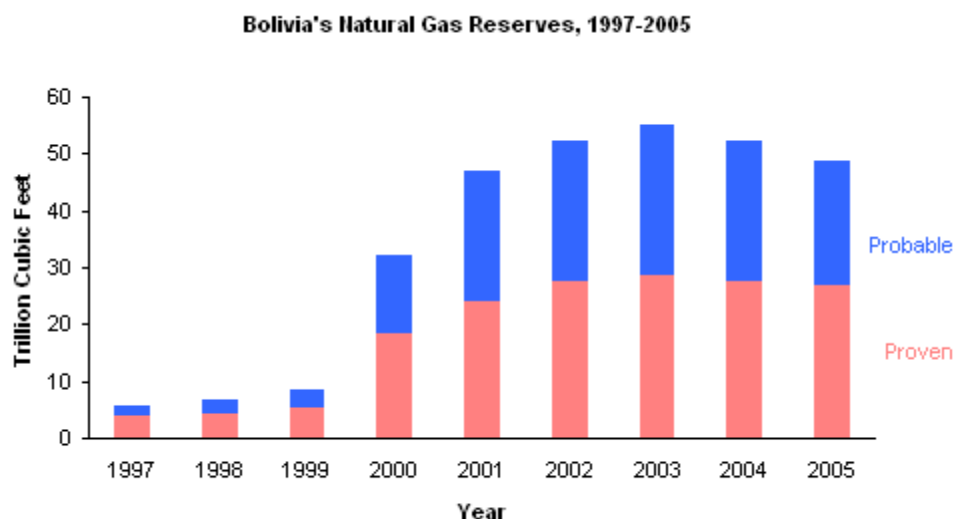
Source: *Oil and Gas Journal*

In the mid-1990s, Bolivia privatized its natural gas sector, leading to an influx in foreign investment. The resulting increase in exploration led to a 600 percent increase in proven natural gas reserves from 1997-2005. There have been several important discoveries in recent years, many containing reserves (proven, probable, and possible) in excess of 10 Tcf. The most important of these finds include Margarita (13.4 Tcf), Ipati (12.0 Tcf), San Alberto (11.8 Tcf), and Sabalo (10.8 Tcf). However, since 2003, probable and proven reserves have declined slightly, as exploration has not kept pace with depletion from production.

### Sector Organization

The development of Bolivia's natural gas reserves has been a controversial issue in the country. Two issues lie at the heart of the controversy. First, there are questions surrounding proposed export paths for liquefied natural gas (LNG), since Bolivia is landlocked. In 2001, Repsol-YPF led a consortium to develop the Pacific LNG project, which included a natural gas pipeline connecting an LNG export terminal at a port in Chile. The plan presented political problems due to a land dispute between Bolivia and Chile dating to a war the two countries fought in the 19th century. In 2003, the Bolivian government decided to move forward with the Pacific LNG project, sparking a wave of protests throughout the country and leading to the resignation of President Sanchez. The Bolivian government has since endorsed a plan to export LNG via a terminal in Peru, but international investors have balked at the idea, due to its higher cost compared to the Chilean plan. Further delays could scuttle the LNG plan completely, since the project would depend upon securing access to an LNG regasification terminal in Mexico or the United States: due to delays in potential LNG exports from Bolivia, such planned and existing terminals have begun to sign long-term supply agreements with other LNG suppliers.

Second, many groups in Bolivia have called for the re-nationalization of Bolivia's natural gas resources. In 2004, Bolivia overwhelmingly approved a referendum that called for the re-nationalization of the formerly state-owned Andina and Chaco oil and natural gas operators. The referendum also called for a sizable increase in taxes on foreign hydrocarbon producers. Additional protests in 2005 forced the resignation of President Mesa, after he opposed implementing the referendum. Following this unrest, foreign investment in Bolivia's natural gas sector plummeted. The country's Chamber of Hydrocarbons, a trade group, reported that investment during the first half of 2005 fell by 80 percent compared to the same period in 2004.



In May 2005, Bolivia's Congress approved a new Hydrocarbons Law that codified the results of the 2004 referendum. The law levies an additional 32 percent tax on oil and gas production at the wellhead, on top of the existing 18 percent royalty. The law calls for the compulsory conversion of existing contracts to the terms of the new law, a provision that international companies have protested and threatened to appeal before international arbitration panels. The new Hydrocarbons Law likely will not affect current natural gas production, but could have serious repercussions on the future expansion of the sector.

In May 2006, President Evo Morales declared a decree re-nationalizing the entire natural gas sector. Under the terms of the decree, foreign companies would not be allowed to own natural gas reserves and YFPB would take a majority stake in all natural gas projects. In addition, private companies would assume a new role under an operating service agreement structure, whereby they would produce natural gas on behalf of YFPB for a fee. The Bolivian government had originally established a November 1, 2006 deadline for the transition to this new structure, but implementation issues have delayed that into the future.

The re-nationalization of Bolivia's natural gas resources could have a profound impact upon the long-term development of the energy sector in the Southern Cone. Bolivia's ability to expand its natural gas exports will depend upon its ability to harness its sizable proven reserves before competing gas sources (LNG, increasing domestic production in Brazil and Argentina, pipelines from Venezuela) entrench themselves in the region. Major natural gas consumers in the region will look towards and invest in these alternative if Bolivia is unable to maintain and expand its existing market share.

### Exploration and Production

Bolivia produced 355 billion cubic feet (Bcf) of natural gas in 2004, while consuming 76 Bcf. Production has risen sharply since 1999, corresponding with the start of natural gas exports to Brazil. The largest natural gas producer in the country is Petrobras; two fields operated by the company, San Alberto and Sabalo, represent one-half of Bolivia's total natural gas production. Repsol-YPF is the second-largest natural gas producer in the country.

### Domestic Pipeline System

Transredes operates Bolivia's domestic natural gas transport network. The 790-mile northern section of the system connects the cities of La Paz, Oruro, Cochabamba, and Santa Cruz with natural gas fields in the Chapare region. The 1,100-mile southern section of the system connects the cities of Sucre, Potosi, and Tarija with the natural gas resources of the Gan Chaco region; the southern system also connects domestic natural gas resources with export pipeline to Brazil and Argentina.

### Exports

*Brazil*

In 1999, Bolivia began exporting to Brazil under a 20-year, take-or-pay contract through the Gasbol pipeline. The 2,000-mile Gasbol connects Santa Cruz, Bolivia to Porto Alegre, Brazil, via Sao Paulo. The system has a maximum capacity of 1 Bcf/d. Gasbol also has a 170-mile, 100-Mmcf/d extension that connects to a gas-fired power plant in Cuibana, Brazil.

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.

**Bolivia's Natural Gas Exports, July 1999 - April 2006**



Source: Ministry of Hydrocarbons; YFPB

Despite these issues, Brazil 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, Brazil 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 (see the [Brazil Country Analysis Brief](#) for additional information).

#### *Argentina*

Bolivia began natural gas exports to Argentina in 1972. While significant exports stopped in 1999, the country resumed exporting sizable amounts of natural gas to Argentina in 2004 in an attempt to help alleviate the Argentine energy crisis (see the [Argentina Country Analysis Brief](#) for more information). In August 2005, the two countries agreed to extend the existing supply contract through 2007. The current agreement between the two countries allows Bolivia to export up to 230 Mmcf/d of natural gas to Argentina, depending upon demand and availability. As is the case with its sales to Brazil, Bolivia has sought to increase the price it receives from Argentina for natural gas exports. In June 2006, Argentina agreed to increase the price it pays for Bolivian natural gas to \$5 per million Btu (MMBtu) from the previous \$3.40 per MMBtu; in addition, Bolivia expected the price to increase further in 2007.

Currently, Bolivia utilizes the 340-mile, 230-Mmcf/d Yabog pipeline for these exports. The two countries have discussed increasing the volume of natural gas exports to Argentina. Such an expansion would require the construction of an additional pipeline, since the Yabog system is at full capacity. To that end, the two announced in August 2006 that they would launch a tender for the \$1-billion, 750-mile Northeastern Pipeline. The system will have a maximum capacity of 700 Mmcf/d, increasing Bolivian export capacity to Argentina to a level near its export capacity to

Brazil. The project will also include a new natural gas liquids (NGL) separation plant in Bolivia that will supply LPG to Bolivian households.

**Bolivia generates the majority of its electric power from natural gas-fired plants.**

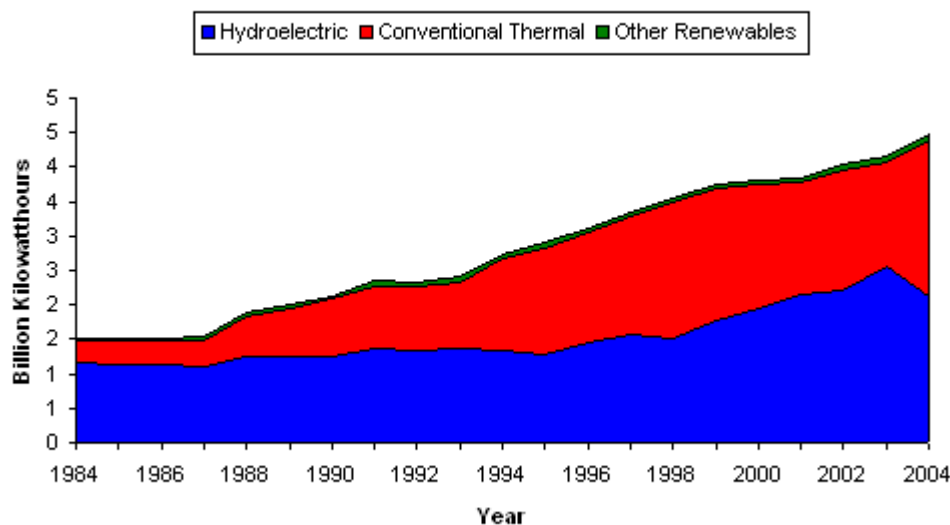
## Electricity

In 2004, Bolivia had 1.4 gigawatts of installed electricity generating capacity. The bulk of this capacity consists of conventional thermal plants, with hydroelectricity providing the balance. Bolivia generated 4.5 billion kilowatthours (Bkwh) and consumed 4.2 Bkwh of electric power in 2004. This does not include electricity generated in rural areas from biomass facilities, which are unorganized, decentralized, and difficult to quantify.

### Sector Organization

In 1994, Bolivia privatized the state-owned electricity system, unbundling generation, transmission, and distribution activities. The law forbids any single company from operating in more than one of these principal activities. The government also established the SE as the principle regulator of the sector. The country has two principle electricity systems: the Sistema Interconectado Nacional (SIN) and the Aislado. The SIN connects major population centers and represents 83 percent of installed capacity. The Aislado system consists of numerous autoproductors and independent power plants in rural or isolated areas not served by the SIN.

**Bolivia's Net Electricity Generation, by Source, 1984-2004**

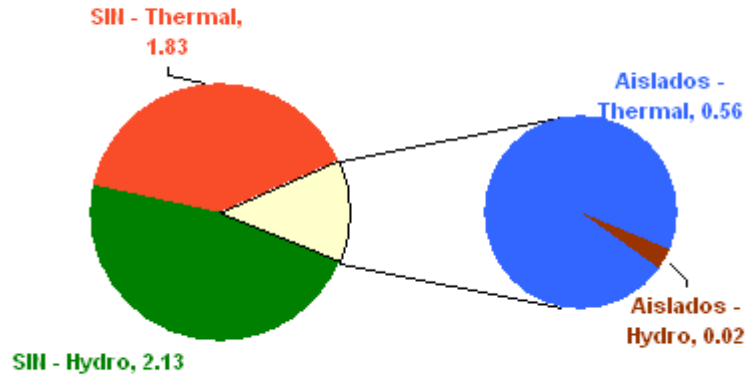


Source: EIA *International Energy Annual*

Of the generation companies serving the SIN, the largest is the Compañía Boliviana de Energía Eléctrica (COBEE), a subsidiary of U.S.-based Globelec. COBEE serves the region surrounding La Paz, the capital. Other important generating companies include Empresa Eléctrica Guarachi (EGSA) and Empresa Eléctrica Corani (CORANI, majority-owned by Duke Energy). These three companies control the bulk of the gross electricity generation in Bolivia. In the distribution sector, the largest company is Electropaz, majority-owned by Spain's Iberdrola. Other large distribution companies include Empresa de Luz y Fuerza Eléctrica Cochabamba (ELFEC), a subsidiary of PPL Global, and Cooperativa Rural de Electrificación (CRE). Combined, the three control almost the entire distribution sector.

Transportadora de Electricidad (TDE), owned by Spain's Red Eléctrica de España, operates the national medium- and high-tension electricity transmission network underlying the SIN. The grid extends over 1,200 miles and covers the central and southern parts of the country. The population in the northern and western parts of the country remains largely unconnected to the national grid, either served by the Aislado system or having no access to electricity at all.

**Bolivia's Gross Electricity Generation, by System and Source, 2004**  
(billion kilowatthours)



Source: Superintendent of Electricity

### Hydroelectricity

Unlike most South American countries, Bolivia is not heavily dependent upon hydropower for its electricity supply. In 2005, Bolivia had 480 megawatts (MW) of installed hydroelectric capacity spread amongst some 21 facilities throughout the country. CORANI operates the largest facility, the 93-MW Saint Isabel plant.

### Conventional Thermal

Bolivia had 870 MW of installed conventional thermal generating capacity in 2004. All of this capacity primarily burns natural gas, though a few plants also use diesel as a backup fuel. EGSA operates the 290-MW GUARACACHI facility, the largest in the country. Other important facilities include the 130-MW Carrasco, operated by Empresa Electrica Valle Hermoso (EVH) and the 120-MW Bulo Bulo, operated by Compania Electrica Central Bulo Bulo (CECBB).

## Profile

### Country Overview

<b>Chief of State</b>	President Juan Evo Morales (since January 2006)
<b>Location</b>	Central South America, southwest of Brazil
<b>Independence</b>	6 August 1825 (from Spain)
<b>Population (2005E)</b>	8,857,870

### Economic Overview

<b>Currency/Exchange Rate (October 17, 2006)</b>	1 Bolivia Bolivianos (BOB) = 0.125 USD
<b>Inflation Rate (2005E)</b>	5.4%
<b>Gross Domestic Product (GDP, 2005E)</b>	\$9.3 billion
<b>Real GDP Growth Rate (2005E)</b>	4.1%
<b>Unemployment Rate (2005E)</b>	8%
<b>External Debt (2005E)</b>	\$6.3 billion
<b>Exports (2005E)</b>	\$2.7 billion
<b>Exports - Commodities</b>	natural gas, soybeans and soy products, crude petroleum, zinc ore, tin
<b>Exports - Partners (2004E)</b>	Brazil 33.9%, US 12.7%, Colombia 11.8%, Venezuela 11.6%, Peru 5.1%, Japan 4.2%
<b>Imports (2005E)</b>	\$2.3 billion
<b>Imports - Commodities</b>	petroleum products, plastics, paper, aircraft and aircraft parts, prepared foods,

	automobiles, insecticides, soybeans
<b>Imports - Partners (2004E)</b>	Brazil 25.3%, Argentina 17%, US 13.1%, Chile 9.2%, Peru 7.2%
<b>Current Account Balance (2005E)</b>	\$470 million

## Energy Overview

<b>Proven Oil Reserves (January 1, 2006E)</b>	0.4 billion barrels
<b>Oil Production (2006E)</b>	64 thousand barrels per day, of which 81% was crude oil.
<b>Oil Consumption (2005E)</b>	48 thousand barrels per day
<b>Crude Oil Distillation Capacity (2006E)</b>	47.3 thousand barrels per day
<b>Proven Natural Gas Reserves (January 1, 2006E)</b>	24 trillion cubic feet
<b>Natural Gas Production (2004E)</b>	0.4 trillion cubic feet
<b>Natural Gas Consumption (2004E)</b>	75.6 billion cubic feet
<b>Recoverable Coal Reserves (2003E)</b>	1.1 million short tons
<b>Coal Production (2004E)</b>	None
<b>Coal Consumption (2004E)</b>	None
<b>Electricity Installed Capacity (2004E)</b>	1.4 gigawatts
<b>Electricity Production (2004E)</b>	4.5 billion kilowatt hours
<b>Electricity Consumption (2004E)</b>	4.2 billion kilowatt hours
<b>Total Energy Consumption (2004E)</b>	0.2 quadrillion Btus*, of which Oil (49%), Natural Gas (40%), Hydroelectricity (11%), Coal (0%), Nuclear (0%), Other Renewables (0%)
<b>Total Per Capita Energy Consumption (2003E)</b>	21.3 million Btus
<b>Energy Intensity (2004E)</b>	6,852.5 Btu per \$2000-PPP**

## Environmental Overview

<b>Energy-Related Carbon Dioxide Emissions (2003E)</b>	10.8 million metric tons, of which Oil (60%), Natural Gas (37%), Coal (0%)
<b>Per-Capita, Energy-Related Carbon Dioxide Emissions (2003E)</b>	1.2 metric tons
<b>Carbon Dioxide Intensity (2004E)</b>	0.4 Metric tons per thousand \$2000-PPP**
<b>Environmental Issues</b>	the clearing of land for agricultural purposes and the international demand for tropical timber are contributing to deforestation; soil erosion from overgrazing and poor cultivation methods (including slash-and-burn agriculture); desertification; loss of biodiversity; industrial pollution of water supplies used for drinking and irrigation
<b>Major Environmental Agreements</b>	party to: Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands signed, but not ratified: Environmental Modification, Marine Life Conservation, Ozone Layer Protection

## Oil and Gas Industry

<b>Organization</b>	Fully privatized, foreign companies control most production and reserves. Government recently announced plans to re-nationalize hydrocarbon resources
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<b>Major Oil/Gas Ports</b>	None (landlocked)
<b>Foreign Company Involvement</b>	BG, BHP, BP, Orca Petroleum, Perez Companc, Petrobras, Pluspetrol, Repsol-YPF, Royal Dutch Shell, Total.
<b>Major Oil Fields</b>	Sabalo, San Alberto, Margarita
<b>Major Natural Gas Fields</b>	Sabalo, San Alberto, Vuelta Grande
<b>Major Pipelines (capacity, Mmcf/d)</b>	Gasbol (1.0 Bcf/d), Yabog (230 Mmcf/d)
<b>Major Refineries (capacity, bbl/d)</b>	Cochabamba (27,250), Santa Cruz de la Sierra (20,000)

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

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

## Links

### EIA Links

[EIA - Country Information on Bolivia](#)

### U.S. Government

[CIA World Factbook on Bolivia](#)

[U.S. Embassy in Bolivia](#)

[U.S. State Department Background Notes on Bolivia](#)

[U.S. State Department Consular Information Sheet on Bolivia](#)

### Foreign Government Agencies

[Ministry of Hydrocarbons](#)

[Superintendency for Electricity](#)

### Oil and Natural Gas

[Gasocidente do Mato Grosso Ltda. \(Gasmat\)](#)

[Transportadora Brasileira Gasoducto Bolivia-Brasil SA \(TBG\)](#)

[Yacimientos Petroliferos Fiscales Bolivianos \(YPFB\)](#)

### Electricity

[Empresa de Luz y Fuerza Eléctrica Cochabamba \(Elfec\)](#)

[Empresa Eléctrica Corani](#)

[Hidroeléctrica Boliviano](#)

[NRG Energy](#)

[Transredes](#)

[Transportadora de Electricidad](#)

## Sources

Associated Press

BBC News

Bolivia 's Superintendency for Electricity

Bolivia 's Superintendency for Hydrocarbons

Central Bank of Bolivia

CIA World Factbook

Comite Nacional de Despacho de Carga

Dow Jones

Global Insight

The Economist

Economist Intelligence Unit ViewsWire

Financial Times

International Monetary Fund

New York Times

OLADE

Oil Daily

Petroleum Economist

Transportadora Brasileira Gasoducto Bolivia-Brasil

U.S. Energy Information Administration  
Wall Street Journal  
Washington Post  
World Markets Online.

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