

## COUNTRY ANALYSIS BRIEFS

# Ecuador

Last Updated: March 2007

### Background

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Ecuador is one of Latin America's largest crude oil exporters, with 2006 net oil exports estimated at 388,000 barrels per day (bbl/d) in 2006. The oil sector dominates the Ecuadorian economy, accounting for 40 percent of export earnings and one-third of all tax revenues. Despite its large oil exports, Ecuador must still import refined petroleum products due to the lack of sufficient domestic refining capacity to meet demand. As a result, the country does not always enjoy the full benefits of high world oil prices: while these high prices bring Ecuador greater export revenues, they also increase the country's refined product import bill.

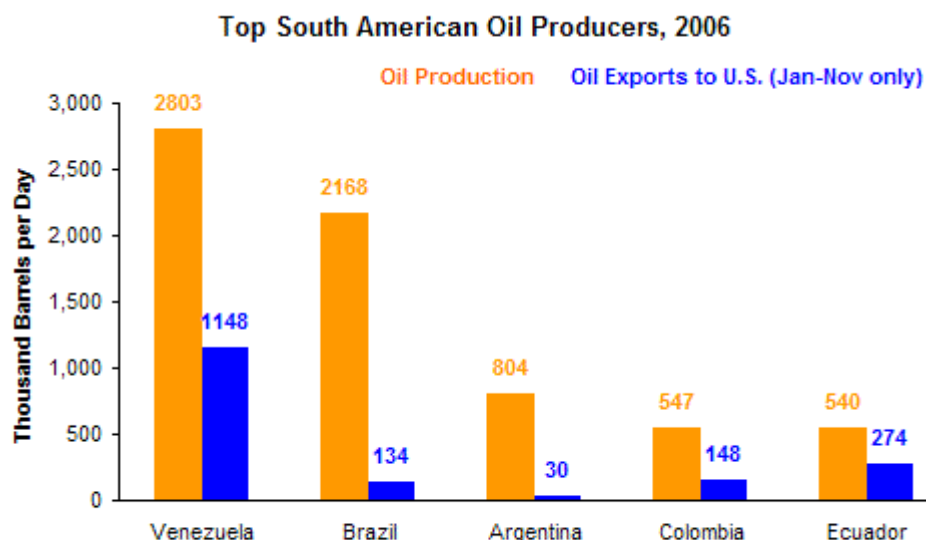


In January 2007, Rafael Correa became the new president of Ecuador. In order to help address the aforementioned domestic refining deficit, President Correa signed a deal with Venezuela in early 2007 for that country to refine 100,000 bbl/d of Ecuadorian crude, then send the refined products back to Ecuador. There has also been talk of building two new refineries in Ecuador, most likely with the assistance of foreign companies. According to media reports, Correa also plans to renegotiate existing oil production contracts, with an eye towards increasing the government take and stricter enforcement of existing contract provisions.

### Oil

***Ecuador is the second-largest South American supplier of crude oil to the United States.***

According to *Oil and Gas Journal* (OGJ), Ecuador held proven oil reserves of 4.5 billion barrels in January 2007, the third largest in South America. Ecuador is the fifth-largest producer of oil in South America, producing 540,000 barrels per day (bbl/d) of oil in 2006, slightly higher than 2005. Crude oil production has risen sizably since the opening of the *Oelductode Crudos Pesados* (OCP) in September 2003 (see below). However, production has remained mostly flat in recent years, the result of natural decline at existing oil fields and the lack of new project development. In 2006, Ecuador consumed 152,000 bbl/d of oil, leaving net exports of 388,000 bbl/d.



Source: EIA Short Term Energy Outlook

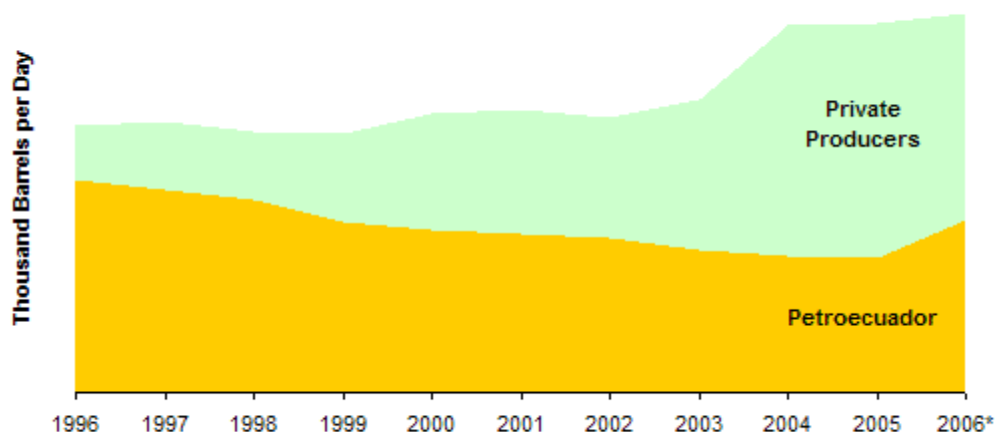
Ecuador is a significant oil exporter, mostly to the United States. Ecuador sends over 50 percent of its oil exports to the U.S., the remainder split between Latin America and Asia. During 2005, Ecuador exported 283,000 bbl/d of crude oil and refined products to the United States, some 2.8 percent of U.S. oil imports during that period. Ecuador is the second-largest source of crude oil imports from South America, after Venezuela. Other important destinations of Ecuador's crude oil exports include Central America (52,000 bbl/d), Peru (47,800 bbl/d), and Chile (11,900 bbl/d).

### Sector Organization

Petroecuador, owned by the Ecuadorian government, was responsible for 46 percent of the country's crude oil production during 2006. The most important private oil companies are foreign-owned, with the largest being Repsol-YPF. During the first half of 2006, Repsol-YPF production in Ecuador represented 11 percent of the country's total crude oil production. Other important foreign oil producers include Andes Petroleum (10.9 percent of national production), a consortium led by the Chinese National Petroleum Corporation (CNPC) that acquired assets in September 2005 formerly owned by EnCana, and Perenco (4.7 percent of national production), and Agip (4.4 percent of national production).

While Ecuador's crude oil production increased 31 percent from 2001 to 2005, Petroecuador's share of national crude oil output declined from 56 percent to 37 percent during that same period. However, Petroecuador's share of national production jumped to 46 percent in 2006, following the company's takeover of the former production assets of Occidental Petroleum. According to media reports about the issue, the proximal cause for the takeover was the claim by the Ecuadorian government that Occidental had violated its production contract by transferring some assets to another oil company. Prior to this, however, there had been other disagreements between the two parties, including a \$76 million arbitration award to Occidental in 2004 over a dispute regarding back taxes. Occidental has since launched an arbitration claim against the Ecuadorian government seeking compensation for the takeover.

### Ecuador's Oil Production, by Sector, 1996-2006



Source: Banco Central del Ecuador

\*Estimated

According to press reports, the newly-elected President Correa will seek to re-negotiate the oil production contracts of private producers in Ecuador. The move will likely seek a larger government take of oil production, either through higher tax and royalty payments or equity stakes in production projects for Petroecuador. The move follows a recent trend in South America, with both [Venezuela](#) and [Bolivia](#) renegotiating production agreements with private operators in order to take advantage of higher world oil prices. It is unclear what impact the contract re-negotiations and disputes with Occidental mean for the future of Ecuador's oil sector. However, several forecasting agencies (including EIA) predict that Ecuador's crude oil production will decline in 2007 and 2008, a sharp change from the increase in production seen since the early 2000s.

#### Exploration and Production

Ecuador's most productive oil fields are located in the northeast corner of the country. The largest oil field is Petroecuador's Shushufindi, which represents around 9 percent of Ecuador's total crude oil production. Other major oil fields include Sacha (Petroecuador), Dorine (Andes), and Eden Yuturi (Petroecuador, formerly Occidental). Ecuador produces two varieties of crude oil: Oriente and Napo. Napo is a heavy, sour crude, with a 19°API and 2 percent sulfur content, while Oriente is a medium-heavy, medium-sour crude, with a 29°API and 1 percent sulfur content.

Future increases in Ecuador's crude oil production will likely come from development of the Ishpingo-Tapococha-Tiputini (ITT) block. The government plans to open ITT to foreign producers through a licensing round in the near future. The ITT block, located in Ecuador's Amazon region, contains an estimated 900 million barrels of proven reserves, with potential recoverable reserves as high as 1.3 billion barrels. Analysts predict that, if fully developed, the block could produce at least 190,000 bbl/d. However, the ITT block reportedly contains a variety of crude oil even heavier than Napo, so any oil producer would need to blend the crude with lighter hydrocarbons before shipping it via Ecuador's pipeline network.

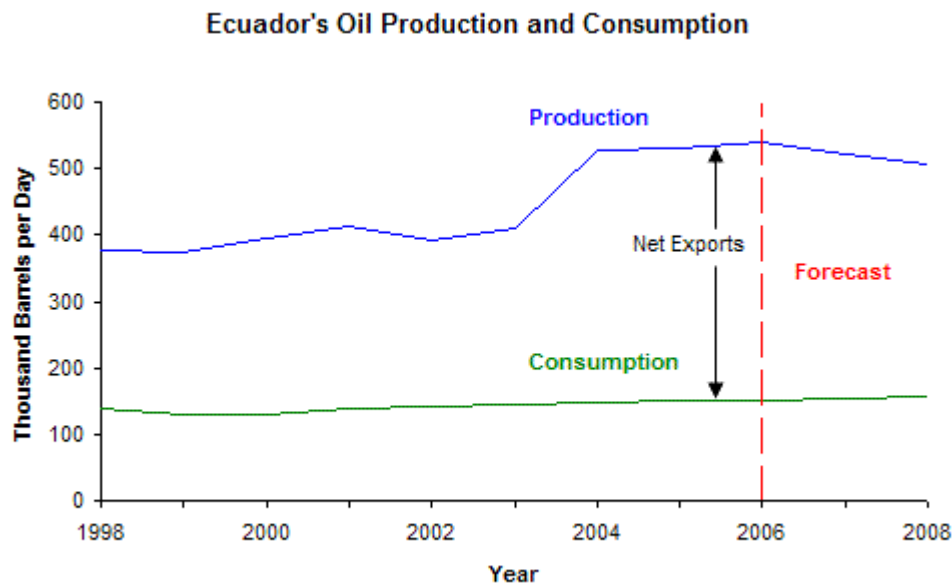
There has been significant opposition to oil development in Ecuador by indigenous groups, which object to increasing oil production in the Amazon region on environmental grounds. These groups have repeatedly obstructed exploration and production activities in Ecuador's eastern region. The ITT block, which sits deep in the Amazon region, will likely face particularly fierce resistance from these groups. Indigenous activists have also brought a lawsuit against ChevronTexaco over Texaco's former oil operations in Ecuador. The suit is still in litigation, but a resolution of the case in favor of indigenous activists could introduce additional risk for foreign oil operators.

Protests against the oil industry can have a direct impact upon the country's crude production. These kinds of production outages are usually small, affecting minor amounts of crude oil production and often last no more than a few weeks. However, these actions will occasional shut-in large segments of Ecuador's oil production capacity. In August 2005, protest groups shut down

Petroecuador's crude oil production for a week, forcing the company to declare *force majeure* on its crude exports. In February 2006, Petroecuador shut down the SOTE pipeline for several days, after protesters occupied a pumping stations.

### Pipelines

Ecuador has two major oil pipeline systems. The first is the *Sistema Oleoducto Trans-Ecuatoriano* (SOTE), built in the early 1970s. The 310-mile, 400,000-bbl/d SOTE runs from Lago Agrio to the Balao oil terminal on the Pacific coast. SOTE has suffered from natural disasters that severely disrupted Ecuador's oil production. In March 2004, a landside halted oil shipments through SOTE, prompting Petroecuador to declare *force majeure* on its export contracts. In 1987, an earthquake destroyed a large section of SOTE, reducing Ecuador's oil production for that year by over 50 percent.



The second oil pipeline is the *Oleoducto de Crudos Pesados* (OCP). The 300-mile, 450,000-bbl/d OCP mostly parallels the route of the SOTE. The OCP began operations in September 2003, and its completion immediately doubled Ecuador's oil pipeline capacity. The completion of the OCP pipeline led to a sharp increase in Ecuador's crude oil production, as private companies are no longer constrained by the capacity limits of the SOTE. Use of the OCP system is mostly confined to private oil producers, with Petroecuador relying upon SOTE.

Ecuador utilizes one international pipeline, the TransAndino. The 50,000-bbl/d pipeline connects Ecuador's oil fields with the Colombian port of Tumaco.

### Downstream Activities

Ecuador has three oil refineries, with a combined capacity of 176,000 bbl/d. The largest refinery in Ecuador is Esmeraldas (110,000 bbl/d), located on the Pacific coast. Ecuador is a net importer of refined oil products: during the first half of 2006, Ecuador's Ministry of Energy and Mines reported that the country imported 62,000 bbl/d of refined products, while exporting 43,000 bbl/d. Further compounding the situation is the nature of Ecuador's trade in petroleum products: in general, the country exports heavy refined products, like fuel oil, and imports lighter products, such as gasoline, diesel, and liquefied petroleum gas (LPG). Since the heavy product exports command a much lower price on the world market than Ecuador must pay for the light product imports, the net trade balance is more skewed than would be suggested by simply comparing import and export volumes.

The Ecuadorian government is actively seeking ways to increase domestic production of lighter petroleum products. These plans include building new refining facilities or upgrading the Esmeraldas plant to better handle Ecuador's heavy domestic crude production. The refining deal with Venezuela will also help the product trade imbalance, since Venezuela's refineries are

already equipped to handle heavy crude varieties, due to the prevalence of heavy crude types in that country's domestic production.

## Natural Gas

***Ecuador has relatively small proven natural gas reserves.***

According to OGJ, Ecuador had 345 billion cubic feet (Bcf) of natural gas reserves as of January 2006. There is negligible domestic demand or support infrastructure for natural gas. The only large-scale natural gas project in Ecuador is the Amistad field, located in the Gulf of Guayaquil, which produced an estimated 30 million cubic feet per day (MMcf/d) during the first half of 2006. All of Amistad's natural gas production flows to Noble's Machala facility, a 130-megawatt (MW), onshore, gas-fired power plant that supplies electricity to the Guayaquil region.

Ecuador's oil industry produces a significant amount of natural gas as part of their operations: oil operators produced 130 MMcf/d of natural gas during the first half of 2006. However, most of that natural gas is flared off, due to a lack of infrastructure to capture it. Ecuador's lack of infrastructure to develop natural gas reserves or capture associated gas production is a contributing factor to the imbalance in its refined product trade. For example, natural gas could provide an alternative for imported LPG, which is principally used for residential heating and cooking. In addition, increased natural gas production could supply more gas-fired power plants, replacing expensive diesel generators.

## Profile

### Country Overview

<b>Chief of State</b>	President Rafael Correa (since Jan 2007)
<b>Location</b>	Western South America, bordering the Pacific Ocean at the Equator, between Colombia and Peru
<b>Independence</b>	24 May 1822 (from Spain)
<b>Population (2006)</b>	13,547,510

### Economic Overview

<b>Currency/Exchange Rate (February 14, 2007)</b>	US Dollar
<b>Inflation Rate (2006E)</b>	3.3%
<b>Gross Domestic Product (GDP, 2006E)</b>	\$38 billion
<b>Real GDP Growth Rate (2006E)</b>	4.6%
<b>Unemployment Rate (2006E)</b>	10.6%
<b>External Debt (2006E)</b>	\$18.1 billion
<b>Exports (2006E)</b>	\$12.9 billion
<b>Exports - Commodities</b>	Petroleum, bananas, cut flowers, shrimp
<b>Imports (2006E)</b>	\$11.5 billion
<b>Imports - Commodities</b>	Vehicles, medical products, telecommunications equipment, electricity
<b>Current Account Balance (2006E)</b>	\$1.2 billion

### Energy Overview

<b>Proven Oil Reserves (January 1, 2007E)</b>	4.5 billion barrels
<b>Oil Production (2006E)</b>	540 thousand barrels per day, of which 100% was crude oil.
<b>Oil Consumption (2006E)</b>	152 thousand barrels per day
<b>Crude Oil Distillation Capacity (0E)</b>	176 thousand barrels per day
<b>Proven Natural Gas Reserves (January 1, 2006E)</b>	345 billion cubic feet
<b>Natural Gas Production (2004E)</b>	6 billion cubic feet
<b>Natural Gas Consumption</b>	6 billion cubic feet

<b>(2004E)</b>	
<b>Recoverable Coal Reserves (2003E)</b>	26.5 million short tons
<b>Coal Production (2004E)</b>	None
<b>Coal Consumption (2004E)</b>	None
<b>Electricity Installed Capacity (2004E)</b>	3.5 gigawatts
<b>Electricity Production (2004E)</b>	12.2 billion kilowatt hours
<b>Electricity Consumption (2004E)</b>	13 billion kilowatt hours
<b>Total Energy Consumption (2004E)</b>	0.4 quadrillion Btus*, of which Oil (77%), Hydroelectricity (19%), Natural Gas (2%), Coal (0%), Nuclear (0%), Other Renewables (0%)
<b>Total Per Capita Energy Consumption (2004E)</b>	29 million Btus
<b>Energy Intensity (2004E)</b>	6,832.4 Btu per \$2000-PPP**

## Environmental Overview

<b>Energy-Related Carbon Dioxide Emissions (2004E)</b>	22.6 million metric tons, of which Oil (90%), Natural Gas (2%), Coal (0%)
<b>Per-Capita, Energy-Related Carbon Dioxide Emissions (2004E)</b>	1.7 metric tons
<b>Carbon Dioxide Intensity (2004E)</b>	0.4 Metric tons per thousand \$2000-PPP**
<b>Environmental Issues</b>	deforestation; soil erosion; desertification; water pollution; pollution from oil production wastes in ecologically sensitive areas of the Amazon Basin and Galapagos Islands
<b>Major Environmental Agreements</b>	party to: Antarctic-Environmental Protocol, Antarctic Treaty, Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands

## Oil and Gas Industry

<b>Organization</b>	State-owned Petroecuador controls a large share of crude oil production. However, the sector is open to private operators, including both foreign and domestic companies.
<b>Major Oil/Gas Ports</b>	Balao, Esmeraldas.
<b>Foreign Company Involvement</b>	Largest foreign producers include Andes Petroleum, Repsol-YPF, Agip.
<b>Major Oil Fields</b>	Shushufindi, Eden Yutui, Sacha, Dorine, Villano, Palo Azul
<b>Major Pipelines</b>	Sistema Oleducto Trans-Ecuatoriano; Oleducto de Crudos Pescados
<b>Major Refineries (capacity, bbl/d)</b>	Esmeraldas (110,000), La Libertad (46,000), Shushufindi (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 - Historical Energy Data on Ecuador](#)

### U.S. Government

[CIA World Factbook - Ecuador](#)

[U.S. Embassy in Quito, Ecuador](#)

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

[U.S. State Department's Consular Information Sheet - Ecuador](#)**General Information**[Information on Ecuador from the Latin America Network Information Center \(LANIC\)](#)[International Monetary Fund \(IMF\) on Ecuador](#)[International Newspapers Online: Ecuador](#)[LatinWorld's section on Ecuador](#)[World Bank on Ecuador](#)**Foreign Government Agencies**[Banco Central del Ecuador \(Central Bank\)](#)[Fondo de Solidaridad](#)[Instituto Nacional de Estadística y Censos \(National Statistical Office\)](#)[Ministry of Energy and Mines](#)**Oil and Natural Gas**[OCP](#)[Petroecuador](#)[Repsol-YPF](#)**Sources**

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Latin American Energy Alert

Latin American Power Watch

Occidental Petroleum

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Perenco

Petrobras Energía

Petroecuador

Petroleum Economist

Petroleum Intelligence Weekly

Platt's Oilgram News

Repsol -YPF

Reuters

Security and Exchanges Commission

Stratfor

U.S. Energy Information Administration

World Bank

World Markets Analysis.

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