Ecuador

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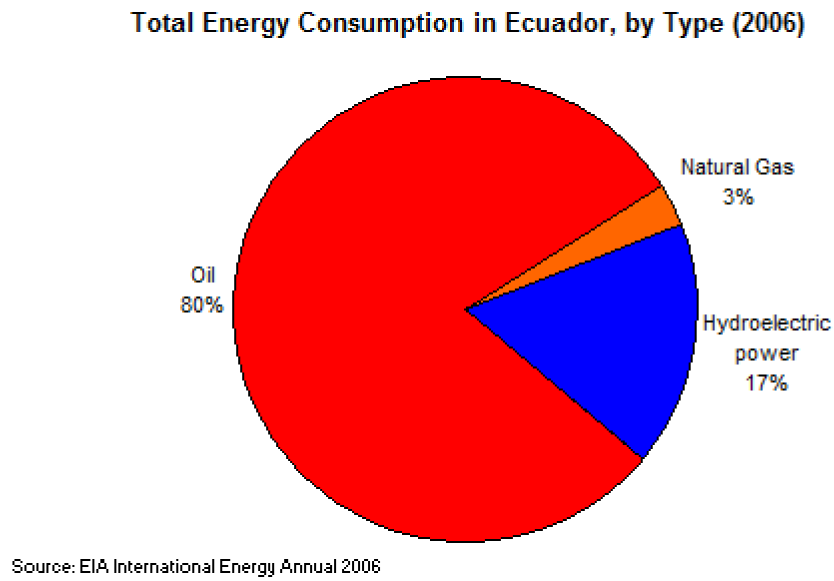
Background

Ecuador is one of the top three oil exporters in Latin America.

Ecuador is one of Latin America's largest oil exporters, with net oil exports estimated at 327,000 barrels per day (bbl/d) in 2008. The oil sector dominates the Ecuadorian economy, accounting for almost half of total 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 local 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 2007, Ecuador re-joined the Organization of the Petroleum Exporting Countries (OPEC), after leaving the organization at the end of 1992. Ecuador is the smallest oil producer in OPEC, with an assigned production quota of 520,000 bbl/d.

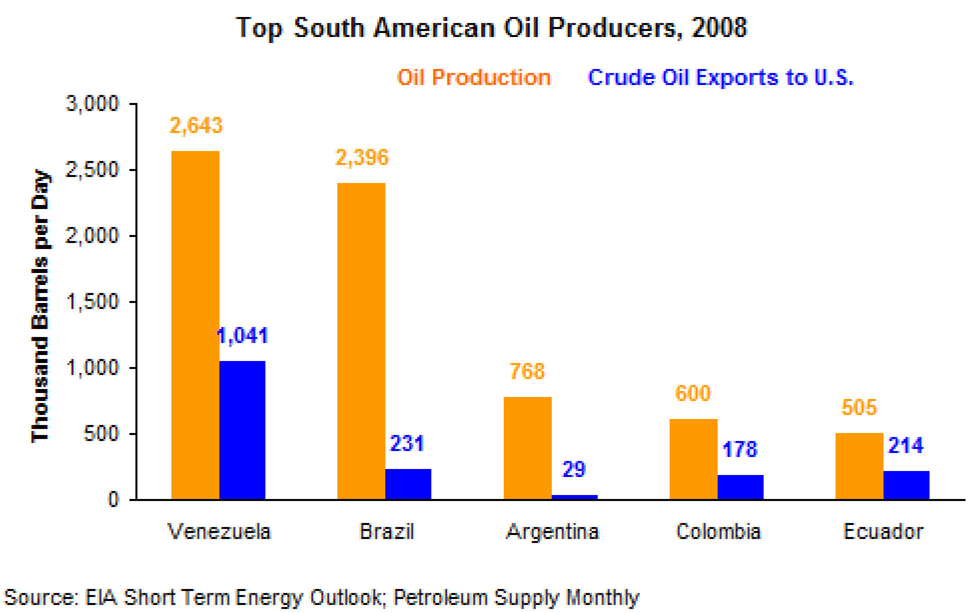
Ecuador's energy mix is largely dependent upon oil, which represented 80 percent of the country's total energy consumption in 2006. Hydroelectric power represented 17 percent of total energy consumption in 2006, and it is the largest source of electricity generation. Natural gas consumption is small, due to the lack of domestic infrastructure to transport and distribute the fuel.



Oil

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

According to *Oil and Gas Journal* (*OGJ*), Ecuador held proven oil reserves of 4.7 billion barrels in January 2009, the third largest in South America. Ecuador is the fifth-largest producer of oil in South America, producing 505,000 bbl/d of oil in 2008 (almost all of which was crude oil), down from 512,000 bbl/d in 2007. Crude oil production has increased sizably since the opening of the *Oelducto de Crudos Pesados* (OCP) in September 2003, which removed a chokepoint on crude oil transportation in the country (see below). However, production has fallen in recent years, the result of natural decline, the lack of new project development, and some operating difficulties at existing oil fields.



In 2008, Ecuador consumed 178,000 bbl/d of oil, leaving 2008 net exports of 327,000 bbl/d. Ecuador sends over 50 percent of its oil exports to the U.S., the remainder split between Latin America and Asia. In 2008, Ecuador exported 221,000 bbl/d of crude oil and refined products to the United States, about two percent of total U.S. oil imports. Ecuador is the third-largest source of U.S. crude oil imports from South America. Ecuador has begun to look more towards the Asian market as a way to diversify its customer base: in April 2009, China reportedly agreed to loan

Ecuador $1 billion, to be re-paid with future oil shipments.

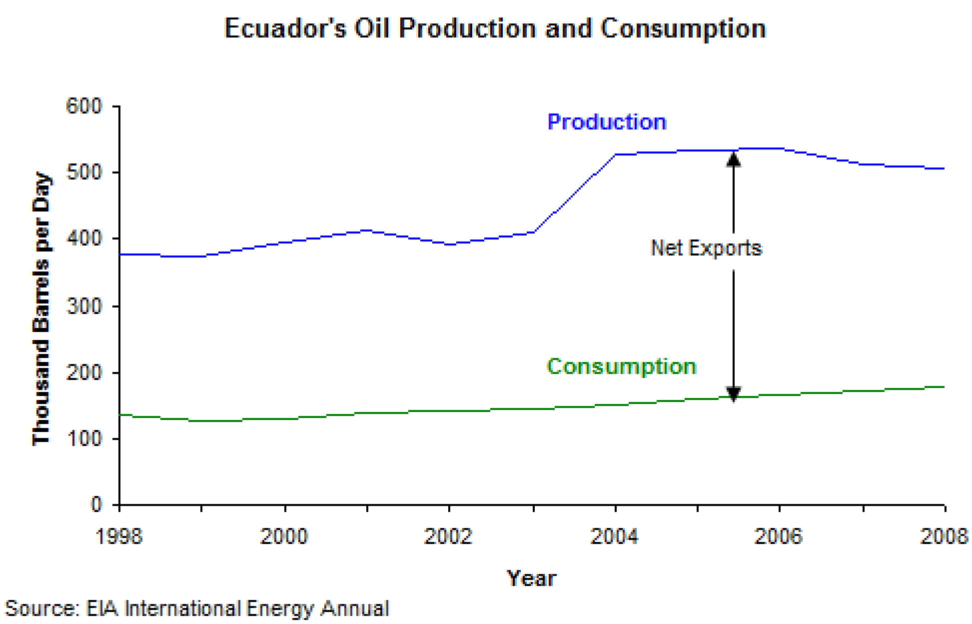
Sector Organization

Petroecuador, owned by the Ecuadorian government, controls about half of the crude oil production in the country. The largest foreign-owned oil company is Repsol-YPF, which represents about 13 percent of the country's total crude oil production. Other important foreign oil producers include Andes Petroleum, a consortium led by the Chinese National Petroleum Corporation (CNPC) that acquired assets in September 2005 formerly owned by EnCana; Perenco; and Agip. 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.

In late 2007, the Ecuadorian government began attempts to transition the contracts for foreign oil companies into service agreements. Under these arrangements, oil companies typically act as an agent that produces oil on behalf of the state, receiving a fee as compensation. In early 2009, the government reportedly reached an agreement with Repsol-YPF under which the company would receive an extension of its operating contract in the country in return for accepting the new contract structure.

Exploration and Production

Ecuador's most productive oil fields are located in the northeast corner of the country. The largest oil field is Shushufindi. Other major oil fields include Sacha, Dorine, and Eden Yuturi. Production has fallen in recent years due to lower investment levels, leading to higher decline rates from existing fields. Ecuador produces two varieties of crude oil: Oriente and Napo. Napo is a heavy, sour crude, with a 19° API and 2 percent sulfur con tent, while Oriente is a medium-heavy, medium-sour crude, with a 29° API and 1 percent sul fur 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. As an alternative to the development of the ITT block, President Correa floated the idea that the international community could pay Ecuador to not produce the oil reserves there. The country sought $350 million per year over a ten year period, representing its estimate of one-half of the revenues that it could earn from oil production from the

ITT block.

Pipelines

Ecuador has two major oil pipeline systems. The first is the *Sistema Oleducto 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 2008, landslides damaged SOTE, shutting operations for several days. 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 *Oleducto 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 were 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. The TransAndino pipeline has occasionally been the target of rebel forces in Colombia, and an attack in March 2008 shut the system down for several days.

Downstream Activities

According to *OGJ*, 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. Despite its status as a crude oil exporter, Ecuador is a net importer of refined oil products. In general, Ecuador 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 value of the net trade balance is more skewed than would be suggested by simply comparing import and export volumes. This can lead to situations where the country is unable to fully take advantage of higher world oil prices, because these higher prices might increase their product import bill by a greater amount than their crude oil export revenues.

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. In late 2008, Ecuador signed a contract with South Korea's SK Engineering to upgrade the Esmeraldas refinery. The $200 million project would seek to conduct repairs to increase utilization rates at the facility. There have also been discussions between Ecuador and Venezuela about the construction of a new refinery in the country. The two countries established a joint company in mid-2008 to build the facility on the Pacific Coast in Manabi province. The planned crude distillation capacity of the refinery is 300,000 bbl/d, with an expected cost of $7 billion. Completion of the project is slated for 2013.

Natural Gas

Ecuador has relatively small proven natural gas reserves.

According to *OGJ*, Ecuador had 315 billion cubic feet (Bcf) of natural gas reserves as of January 2009. There is negligible domestic demand or support infrastructure for natural gas in the country. The only large-scale natural gas project in Ecuador is the Amistad field, located in the Gulf of Guayaquil, which produced an estimated 26 million cubic feet per day (MMcf/d) in 2007. 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. Other efforts to develop natural gas reserves in the Gulf of Guayaquil include plans by Chile's Enap and Venezuela's PdVSA to work with Petroecuador in 2008 to explore additional blocks in the area.

Ecuador's oil industry produces a significant amount of natural gas as part of their operations: oil operators produced 118 MMcf/d of natural gas during the first half of 2007. However, most of that natural gas is flared due to the lack of infrastructure to capture it.

Profile

Energy Overview

Proven Oil Reserves (January 1,	4.7 billion barrels

2009E)	
Oil Production (2008E)	505 thousand barrels per day
Oil Consumption (2008E)	178 thousand barrels per day
Crude Oil Distillation Capacity (2008E)	176 thousand barrels per day
Proven Natural Gas Reserves (January 1, 2009E)	315 billion cubic feet
Natural Gas Production (2006E)	10 billion cubic feet
Natural Gas Consumption (2006E)	10 billion cubic feet
Recoverable Coal Reserves (2005E)	26 million short tons
Coal Production (2007E)	None
Coal Consumption (2007E)	None
Electricity Installed Capacity (2007E)	4.0 gigawatts
Electricity Production (2006E)	14.8 billion kilowatt hours
Electricity Consumption (2006E)	12.9 billion kilowatt hours
Total Energy Consumption (2006E)	0.4 quadrillion Btus*
Total Per Capita Energy Consumption (2006E)	31.0 million Btus
Energy Intensity (2006E)	5,626 Btu per $2000-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2006E)	25.5 million metric tons
Per-Capita, Energy-Related Carbon Dioxide Emissions (2006E)	1.9 metric tons
Carbon Dioxide Intensity (2006E)	0.3 Metric tons per thousand $2000-PPP**

Oil and Gas Industry

Organization	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.
Major Oil/Gas Ports	Balao, Esmeraldas.
Foreign Company Involvement	Largest foreign producers include Andes Petroleum, Repsol-YPF, Agip.
Major Oil Fields	Shushufindi, Eden Yutui, Sacha, Dorine, Villano, Palo Azul
Major Pipelines	Sistema Oleducto Trans-Ecuatoriano; Oleducto de Crudos Pescados
Major Refineries (capacity, bbl/d)	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.
**GDP figures from Global Insight estimates based on purchasing power parity (PPP) exchange rates.

Links

EIA Links

EIA - Ecuador Country Energy Profile

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

International Monetary Fund (IMF) 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

Sources

Americas Oil and Gas Insights
Andean Community
Associated Press
Business News Americas
China Energy Report Weekly
CIA World Factbook
Dow Jones News Wire Service
Economist
Ecuador Ministry of Energy and Mines
Energy Compass
EFE News Service
EnCana
Financial Times
Global Power Report
Economist Intelligence Unit (EIU) ViewsWire
Eni
Financial Times
Global Insight
International Energy Agency
International Market Insight Reports
International Monetary Fund
International Oil Daily
International Petroleum Finance
Latin America News Digest
Latin American Energy Alert
Latin American Power Watch
Occidental Petroleum
Odebrecht
Oil and Gas Journal
Oil Daily
Perenco
Petrobras Energía
Petroecuador
Petroleum Economist
Petroleum Intelligence Weekly
Platt's Oilgram News
Repsol-YPF
Reuters
Security and Exchanges Commission
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World Bank
World Markets Analysis

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