



[Countries](#)

Ecuador



Last Updated: January 16, 2014 ([Notes](#))

[full report](#)

Overview

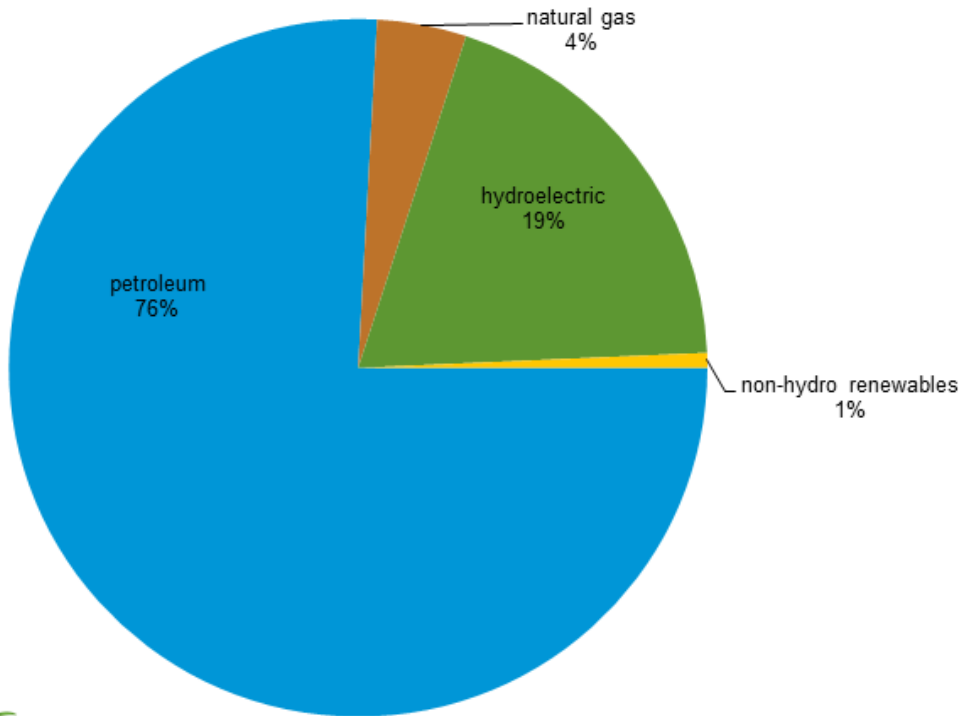
Ecuador is the smallest oil producing member of the Organization of the Petroleum Exporting Countries (OPEC).

In Ecuador, the oil sector accounts for a sizeable portion of all export earnings and represents one-third of all tax revenues. Resource nationalism and debates about the economic, strategic, and environmental implications of oil sector development are prominent issues in the politics of Ecuador and the policies of its government. The smallest producer in the Organization of the Petroleum Exporting Countries (OPEC), Ecuador produced 505,000 barrels per day (bbl/d) of crude oil in 2012 and exported more than one-third of it to the United States. A lack of sufficient domestic refining capacity to meet local demand has forced Ecuador to import refined products, limiting net oil revenue.

Ecuador rejoined OPEC in 2007 following a near 15-year hiatus from the organization. Despite a challenging investment environment prompted by government initiatives to increase the share of oil revenue for the state, 2012 oil production in Ecuador returned to the 2008 annual level.

Ecuador's energy mix is largely dependent on oil, which represented 76% of the country's total energy consumption in 2012, according to the British Petroleum's Statistical Review of World Energy 2013. Hydroelectric power was the second largest energy source. Natural gas and non-hydro renewable fuels are also important to Ecuador's energy mix.

Total primary energy consumption in Ecuador, by type (2012)



 Source: British Petroleum's 2013 Statistical Review of World Energy



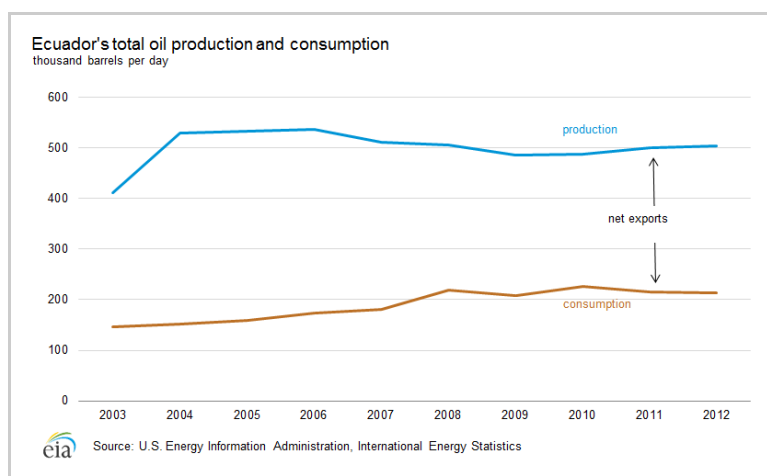
Oil

Ecuador is the fifth-largest oil producer in Central and South America and a leading source

of crude oil imports into the U.S. West Coast.

Ecuador, the fifth-largest oil producer in South America, produced 505,000 bbl/d of liquid fuels in 2012, of which almost all was crude oil and the remainder condensate and natural gas liquids. Historically, Ecuador has exported most (roughly 70%) of the crude oil it produces. The United States is Ecuador's largest crude oil importer. However, Ecuador plans to diversify with exports to Asian markets, particularly [China](#).

As of January 2013, Ecuador had more than 8 billion barrels of proven crude oil reserves, which is a year-over-year increase of 14%. Ecuador has the third largest oil reserves in South America, following [Venezuela](#) and [Brazil](#). Most of Ecuador's oil reserves are in the Oriente Basin, which is located under the Amazon.



Sector organization

Ecuador's hydrocarbon resources are exclusively owned by the state, and changes to Ecuador's legal framework continue a trend towards policies of resource nationalism.

In 2012, national oil companies (NOCs) Petroecuador, Petroamazonas, and Operaciones Rio Napo, a joint venture between Petroecuador and Petroleos de Venezuela, accounted for roughly 73% of total production in Ecuador, with the remainder attributed to fields operated by private companies. In November 2012, Petroamazonas began operating fields formerly managed by Petroecuador and Operaciones Rio Napo. International oil companies (IOCs) operating in Ecuador include Repsol (Spain), Eni (Italy), Enap (Chile's state-owned company), and Andes Petroleum, which is a consortium of the China National Petroleum Corporation (CNPC, 55% share) and the China Petrochemical Corporation (Sinopec, 45% share). The Ministry of Non-Renewable Natural Resources is responsible for energy policy decisions, while the Hydrocarbons Regulation and Control Agency regulates the oil sector.

Hydrocarbon resources are exclusively owned by the state. Ecuador limits foreign investment in the sector. Foreign oil and gas companies are allowed to enter into service contracts that offer a fixed per-barrel fee for their exploration and production activities. The move away from production-sharing agreements to service contracts has increased the government's share of revenue, but deterred the interest of private sector participants including Noble Energy, Petrobras, and Canada Grande.

The changes to Ecuador's legal framework continue a trend toward policies of resource

nationalism in the oil sector. In 2006, Petroecuador took over the production assets of Occidental Petroleum after contracts expired. In 2009, following a tax dispute, the government also appropriated two blocks assigned to Perenco. Chevron's lengthy legal battle with Ecuadorean plaintiffs is a much different issue, waged in a different arena, but it also raises questions about the potential costs of investing in Ecuador. In February 2011, an Ecuadorean court ordered Chevron to pay more than \$18 billion in damages to indigenous communities that it had found to be harmed by Texaco's operations in Ecuador between 1964 and 1990 (the company was later acquired by Chevron). Chevron is appealing, and an international tribunal is due to rule on the matter in 2014.

Since 2009, Ecuador has agreed to multiple oil-for-loan deals with China that explicitly guarantee oil exports to China in exchange for loans. The loans also require Ecuador to invest a share of the loaned amount in projects involving Chinese companies. These loans have been applied to the development of hydroelectric complexes and other energy-related projects. China has also made large-scale loans to Ecuador at times that coincide with oil supply agreements.

Exploration and production

Oil production has been near-stagnant in Ecuador since 2007 at around 500,000 bbl/d. Substantial oil reserves are located in the Ishpingo-Tambococha-Tiputini (ITT) fields in Yasuní National Park. The fields were under moratorium from oil extraction between 2007 and the summer of 2013, an effort by the Ecuadorean government to protect biodiversity and avoid dislocation of two isolated indigenous cultures. However, on August 15, 2013, Ecuador's president Rafael Correa announced an end to the moratorium.

Ecuador produced 505,000 bbl/d in 2012, almost all of which was crude oil. Ecuador's oil production increased year-over-year from 2011, but remains below a 2006 peak of 536,000 bbl/d. The steady increase in state oil production and the decline in private sector production suggest that some of the increases in state oil production were because state absorption of assets owned and operated by private companies, according to PFC Energy.

Ecuador's most productive oil blocks are located in the northeastern part of the country. According to PFC Energy, Shushufindi and Auca (two of the most prolific fields) together produced an average of 31,000 bbl/d in 2010. Crude oil production increased sizably in 2003 with the opening of the Oelducto de Crudos Pesados (OCP) pipeline, which removed a chokepoint on heavy crude oil transportation in the country. However, production has leveled off in recent years as the result of natural decline, the lack of new project development, and operating difficulties at existing, mature oil fields. The inauguration of the Panacocha field in the Ecuadorean Amazon, the first new production expansion since the current government took office in 2007, is one reason for slight increases in production over the last two years.

The Ishpingo-Tambococha-Tiputini (ITT) fields in Yasuní National Park hold an estimated 909 million barrels of proven and probable oil reserves, according to a study by French company Beicip-Franlab, conducted for Petroecuador. The fields were under moratorium from oil extraction between 2007 and the summer of 2013, an effort by the Ecuadorean government to protect biodiversity and avoid dislocation of two isolated indigenous cultures. However, on August 15, 2013, Ecuador's president Rafael Correa announced an end to the moratorium as a result of failed efforts to raise contributions from the international community. Subsequently, the development of hydrocarbon resources in the ITT fields was

deemed of national interest. The Tiputini and Tambococha fields are expected to begin production first.

Trade

The United States imported 177,000 bbl/d of crude oil from Ecuador in 2012, down from a peak of 276,000 bbl/d in 2005. Other leading destinations for Ecuadorean crude are Chile, Peru, and Japan.

Ecuador exported 354,000 bbl/d of crude oil in 2012, according to statistics from Banco Central del Ecuador. It markets two grades of oil: Oriente, which accounts for two-thirds of total exports, and Napo, which is a heavier grade. Aside from the United States, which was Ecuador's largest crude oil customer, trade data suggest that other leading destinations for Ecuadoran crude are Chile, Peru, and [Japan](#). Despite reports of stronger bilateral relations between China and Ecuador, China was not a large importer of Ecuadoran crude in 2011. However, preliminary data show a moderate increase in flows to China in 2012.

The United States imported 177,000 bbl/d of crude oil from Ecuador in 2012, down from a peak of 276,000 bbl/d in 2005. Ecuador was the 11th largest supplier of foreign oil to the United States, and was responsible for 2% of total U.S. crude oil imports. However, Ecuador was the third largest source of foreign oil for the West Coast (Petroleum Administration for Defense District V), which was the destination for almost all Ecuadoran oil exports to the United States. Consequently, Ecuador is a more regionally significant source of supply for the West Coast, which is relatively isolated from other parts of the continental United States because of relatively few overland pipelines, than it is for the United States as a whole.

Despite its status as a crude oil exporter, Ecuador is a net importer of refined oil products. In general, Ecuador exports heavy refined products, such as fuel oil, and imports lighter products, including gasoline, diesel, and liquefied petroleum gas (LPG). According to data from the central bank, Ecuador exported 27,000 bbl/d of refined products in 2012, and it imported approximately 110,000 bbl/d. Of the total imports, 63,000 bbl/d was imported from the United States, most of which was distillate fuel oil, liquefied petroleum gas, and gasoline.

Pipelines

Ecuador's domestic pipeline infrastructure is old and limited. Ecuador has 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 attacks in Colombia.

Ecuador has two major oil pipeline systems. The older and more widely used pipeline is the Sistema Oleducto Trans-Ecuatoriano (SOTE), which was 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. Ecuador's 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 and facilitated increased production. Approximately 70% of the country's crude travels through SOTE, with the remainder transported through OCP.

Ecuador uses 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 attacks in [Colombia](#). Although the security environment has improved in recent years, the pipeline has been compromised as recently as July 2012.

In August 2012, Peru's state oil company and Ecuador's Secretary of Hydrocarbons signed an agreement to transport Ecuadorian oil from blocks in southeastern Ecuador. The agreement will require a 62-mile branch line to connect with the Norperuano pipeline in Peru's Loreto region. According to PFC Energy, the project has since been abandoned.

Downstream

Ecuador has three commercial oil refineries, with a combined capacity of 176,000 bbl/d. Ecuador and Venezuela have been in discussions to construct a new refinery, and China's Sinopec and/or CNPC might fund a portion of the project.

According to *Oil and Gas Journal*, Ecuador has three commercial oil refineries, with a combined capacity of 176,000 bbl/d. Operated by Petroindustrial, a subsidiary of Petroecuador, Esmeraldas (110,000 bbl/d) is in Esmeraldas, La Libertad (46,000 bbl/d) is in Santa Elena Peninsula, and Shushufindi (20,000 bbl/d) is located in Sucumbíos.

Esmeraldas operates below capacity and is slated to be upgraded to process heavier Ecuador Oriente crude. In addition, Ecuador and Venezuela have been in discussions to construct a new refinery with a crude distillation capacity of 300,000 bbl/d in the Manabí province of Ecuador. According to recent industry reports, China's Sinopec and/or CNPC might fund a portion of the project.

Ecuador consumed 213,000 bbl/d of oil in 2012. According to the International Energy Agency (IEA), roughly one-third of Ecuador's oil consumption is diesel fuel and another one-fourth is motor gasoline. Fuel prices are controlled by the central government.

Natural gas

Ecuador has relatively small proven natural gas reserves and a limited natural gas market.

As of January 2013, Ecuador had an estimated 247 billion cubic feet (Bcf) of natural gas reserves. The country's gross natural gas production was 54 Bcf in 2012, of which 36 Bcf was marketed and the remainder was flared and vented. Dry natural gas production (occurring when associated liquid hydrocarbons are removed) was 18 Bcf, of which all was domestically consumed. Its low natural gas utilization rates are due mainly to a lack of infrastructure to capture and market natural gas.

Located in the Gulf of Guayaquil, the Amistad field is Ecuador's primary natural gas project. The field is operated by Petroamazonas and produced an estimated 60 million cubic feet per day (MMcf/d) in 2012. However, the addition of a new jackup platform and wells is expected to raise production in the near future. Petroecuador took over the Amistad project after U.S.-based Noble Energy decided to exit the country rather than renegotiate its product contract. Amistad's natural gas production flows to the Machala facility, a 130-megawatt (MW) onshore, gas-fired power plant that supplies electricity to the Guayaquil region.

Exploration activities are done mostly by Petroamazonas, although, Andes Petroleum, ENAP, and PdVSA also participate in exploration.

Electricity

In 2011, hydroelectricity accounted for more than 50% of the country's generation. The other large source of electricity supply is a group of oil-powered conventional thermal power plants.

At the end of 2008, there were more than 200 power plants in operation, with 89 providing power to the National Interconnected System. According to the most recent data available, Ecuador generated 20 billion kilowatt-hours (kWh) of electricity from 5.3 gigawatts (GW) of capacity in 2011. Hydroelectricity accounted for 11 billion kWh (over 50%) of the country's generation, but a somewhat smaller share of total nameplate capacity because of hydro's high capacity utilization rates. The other large source of electricity supply is the country's suite of conventional thermal power plants, which in Ecuador are mostly equipped to burn oil.

Most of Ecuador's hydro capacity is located in Azuay province, in the south-central highlands. Paute-Molino is the country's single-largest hydroelectric complex at almost 1.1 GW of capacity. Droughts in late-2009 affected flows in Paute River and caused the government to implement rolling blackouts from November 2009 to January 2010. To address capacity shortages, Ecuador plans to build six new hydroelectric power plants with a total generating capacity of 2.8 GW in the coming decade. The Coca Codo Sinclair plant, which will be located in the Napo province, is expected to have a generating capacity of 1.5 GW. Financing for all of the new projects will come from China.

There is also a small amount of bagasse-fired thermal power and limited wind and solar capacity, which are supported through feed-in tariffs. Ecuador has transmission grid interconnections with Colombia and Peru, and the country is a small net importer of electricity.

Of the non-hydro renewable fuels, bagasse, a fibrous residue of processed sugarcane, is used in industry and traditional biomass is used in rural households. However, estimates of traditional biomass consumption are imprecise because biomass sources (fuel wood, charcoal, manure, and crop residues) are not typically traded in easily observable commercial markets.

The electricity grid, however, does not reach all Ecuadoreans. The International Energy Agency (IEA) reports that nearly 8% of the population (mostly in rural areas) does not have access to electricity. Residential users are responsible for approximately one-third of electricity demand, according to the National Council of Electricity (CONELEC), closely followed by the industrial sector.

Notes

- Data presented in the text are the most recent available as of January 16, 2014.
- Data are EIA estimates unless otherwise noted.

Sources

- Banco Central de Ecuador
- Consejo Nacional de Electricidad (CONELEC)
- Economist
- Energy Compass
- Financial Times
- Economist Intelligence Unit (EIU)
- Energy Intelligence Group
- FACTS Energy
- Financial Times
- Global Insight
- Global Trade Atlas
- International Energy Agency
- International Monetary Fund
- International Oil Daily
- Latin America Oil and Gas Monitor
- Ministerio de Recursos Naturales No Renovables
- Oil and Gas Journal
- Oil Daily
- Petroecuador
- Petroleum Intelligence Weekly
- Reuters
- Rigzone
- Tenders Info
- UPI Energy
- U.S. Department of State
- U.S. Energy Information Administration
- World Bank