



# 2019 Minerals Yearbook

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**ECUADOR [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRY OF ECUADOR

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In 2019, the Government of Ecuador sought to diversify its mineral portfolio to decrease its reliance on crude petroleum by commissioning two large-scale metal mines, which began operating late in the year. The mines included the Mirador copper mine, which was operated by Ecuacorriente S.A. (Ecsa; a subsidiary of Chinese consortium CRCC-Tongling Nonferrous Metals), and the Fruta del Norte gold mine, which was owned by Lundin Gold Inc. Both mines were located in southeastern Ecuador. Other mineral commodities produced in the country included antimony, barite, clay (kaolin), construction sand and gravel, feldspar, limestone, natural gas, pumice, silica sand, silver, and steel (Agencia de Regulación y Control Minero, 2019; Banco Central del Ecuador, 2020d, p. 5, 8–9).

In 2019, the mineral industry in Ecuador continued to be dominated by the petroleum sector, which accounted for about 39% of the country's total export revenue. Ecuador accounted for almost 7% of Latin America's total crude petroleum production, and it had the third largest proven reserves of petroleum in Latin America in 2019. The country's national petroleum company, Empresa Pública de Hidrocarburos del Ecuador (EP Petroecuador) and its subsidiaries accounted for most of the petroleum production in Ecuador during the year. In October, the Government of Ecuador announced its withdrawal as a member of the 14-nation bloc Organization of the Petroleum Exporting Countries (OPEC) owing to fiscal challenges. Ecuador became a member of OPEC in 1973, withdrew in 1992, and rejoined the organization in 2007. Although Ecuador maintained its position as the fifth-ranked petroleum producer in Latin America and had the third largest proven reserves of petroleum in Latin America in 2019, the Government planned to raise revenue by increasing petroleum production above annual quotas previously set by OPEC (table 2; Thomson Reuters, 2019b; Banco Central del Ecuador, 2020b; Organization of the Petroleum Exporting Countries, 2020, p. 22, 26).

In 2019, Ecuador's nominal GDP was \$107.4 billion. The country's year-on-year rate of growth of the GDP in 2019 was 0.1%. The manufacturing sector accounted for about 15% of the country's GDP; the construction sector, for about 12%; and the mining and quarrying sector (including hydrocarbons), for about 6%. In 2019, the value of the mineral sector (including hydrocarbons) decreased slightly to a little more than \$6 billion (Comisión Económica para América Latina y el Caribe, 2020a, b).

In 2019, the total free on board (f.o.b.) value of Ecuador's exports increased slightly to about \$22.3 billion from \$21.6 billion in 2018. The value of Ecuador's imports, as reported in terms of cost, insurance, and freight (c.i.f.) arrangements, decreased slightly to about \$21.4 billion from \$22.1 billion in 2018. The value of Ecuador's mineral exports in 2019 (including the value of exports of copper concentrates, gold, lead, and silver concentrates; crude petroleum; and other unspecified minerals) totaled slightly greater than \$8 billion. Of that amount, crude petroleum accounted for about 96% of

the total value of mineral exports. During the year, the country exported 7,913 kilograms (kg) of gold valued at \$194 million. Ecuador's mineral exports to the United States totaled more than \$4.5 billion in 2019, most of which was petroleum. Imports of unspecified mineral products accounted for about 7.4% of the country's total imports, or about \$1.6 billion compared with \$1.8 billion in 2018 (Banco Central del Ecuador, 2020b; U.S. Census Bureau, 2020).

Ecuador's foreign direct investment (FDI) inflows in 2019 were not made available by the central bank; however, in 2018, the country's total FDI inflows were \$1.4 billion. The total amount of FDI directed towards mines and quarries was \$738.5 million in 2018. Total combined investments by Lundin Gold in the Fruta del Norte Mine and by Ecsa in the Mirador Mine were expected to total more than \$230 million in 2020. These two new large-scale mines had received total investments of more than \$2.6 billion (combined) since 2007 (Banco Central del Ecuador, 2020a; 2020d, p. 5, 8).

## Production

Data on mineral production are in table 1.

## Structure of the Mineral Industry

Established in 2010, Empresa Nacional Minera del Ecuador (ENAMI) was the state-owned mining company in charge of managing the country's nonrenewable mining concessions, including protecting the environment and community rights. Empresa Pública de Hidrocarburos del Ecuador (EP Petroecuador) was the state-owned petroleum company in charge of the exploration for and production, storage, and refining of crude petroleum as well as the sale of petroleum products. EP Petroecuador operated several oilfields, including the Auca, the Sacha, the Shushufindi, and the Libertador fields. Table 2 is a list of major mineral industry facilities (Empresa Nacional Minera del Ecuador, 2020; EP Petroecuador, 2020).

## Commodity Review

### Metals

**Copper.**—The Mirador copper project, Ecuador's first large-scale open pit mine, exported its first copper concentrate through Guayaquil Port; the concentrate was destined for the city of Tongling, China. Ecsa, which had a 30-year concession to mine Mirador, had invested about \$1.4 billion and paid \$85 million in royalties to the Government of Ecuador to develop the mine. The Mirador copper project, which is located in the Province of Zamora Chinchipe, had estimated reserves of about 3.2 million metric tons of copper (metal), more than 105,000 kg of gold, and about 843,000 kg of silver. The project, which had a projected mine life of approximately 30 years, was expected to generate more than 2,500 direct mining jobs during that time.

The mine was expected to ramp up to an annual production capacity of 96,000 metric tons per year in 2022 (Agencia de Regulación y Control Minero, 2020, p. 12–14; Banco Central del Ecuador, 2020d, p. 8; S&P Global Market Intelligence, 2020).

**Gold.**—In 2014, Lundin Gold acquired the Fruta del Norte project along with surrounding exploration concessions located in southeastern Ecuador. The company's Fruta del Norte project comprised seven concessions and covered an area of approximately 5,566 hectares. Late in 2019, the Fruta del Norte Mine achieved commercial production and exported its first shipment of gold concentrate, valued at \$20.9 million, from the Port of Guayaquil to the European market. The mine produced almost 892 kilograms of gold during the year. The 10,000-kilogram-per-year-capacity Fruta del Norte Mine was considered one of the largest and highest graded gold projects in the world, and it had estimated gold reserves of approximately 155,500 kg. The projected life of the mine was approximately 14 years, and the mine was expected to generate more than 3,600 direct mining jobs during that time (Agencia de Regulación y Control Minero, 2020, p. 8–11; Lundin Gold Inc., 2020, p. 2–3).

### *Mineral Fuels and Related Materials*

**Petroleum.**—In 2019, Ecuador produced about 530,800 barrels per day (bbl/d) of crude petroleum compared with 517,200 bbl/d in 2018, which was an increase of about 2.6%. The country accounted for less than 1% of the world's total crude petroleum production, and its production was the fourth lowest of the oil-producing OPEC members in 2019 prior to its withdrawal from the organization. Petroleum output from state-owned companies reached 153 million barrels (Mbbbl) compared with 146 Mbbbl in 2018. Production from private companies decreased by about 3.5% in 2019 to 41 Mbbbl. Ecuador's crude petroleum reserves in 2019 were 8.3 billion barrels. There were 21 active oil rigs in Ecuador in 2019 compared with 28 in 2018. Ecuador exported about 75% of its crude petroleum output in 2019 (Banco Central del Ecuador, 2020c; Organization of the Petroleum Exporting Countries, 2020, p. 22–23, 26, 48).

**Refinery Products.**—Ecuador's total production of refinery products in 2019 decreased to about 76 Mbbbl, or by 7% compared with that of 2018. The state-owned Esmeraldas refinery underwent a planned partial shutdown for maintenance during the year, decreasing its daily output by about one-half. The partial shutdown of the Esmeraldas refinery lasted about 3 months. The Government of Ecuador was expected to increase the country's refinery capacity by an additional 300,000 bbl/d in the coming years. Ecuador's refinery capacity remained constant at 188,000 bbl/d in 2019 (table 2; Organization of the Petroleum Exporting Countries, 2020, p. 34; Thomson Reuters, 2019a).

### **Outlook**

Ecuador's economy is not expected to improve until 2021. According to the World Bank, the real GDP is projected to decrease by 1.3% in 2020 before increasing by 1.4% in 2021. Mineral export revenues are projected to increase when the two new large-scale metal mines—the Fruta del Norte gold mine and the Mirador copper mine—ramp up to full production.

The mineral sector (not including hydrocarbons) is expected to contribute up to 4% to the country's GDP by 2021. By not being subject to OPEC's crude petroleum production quotas, the Government of Ecuador is also expected to increase Government revenue by increasing crude petroleum and refinery production in the country's hydrocarbon sector (Agencia de Regulación y Control Minero, 2020, p. 5; World Bank, The, 2020).

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TABLE 1  
ECUADOR: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2015	2016	2017	2018	2019
<b>METALS</b>					
Antimony, mine, Sb content	19	16 <sup>r</sup>	68 <sup>r</sup>	9 <sup>r</sup>	1
Copper, mine, concentrates, Cu content <sup>e</sup>	1	40	8	42	50 <sup>e</sup>
Gold, mine, Au content	7,723	6,761	6,368	8,213	8,300 <sup>e</sup>
Iron and steel, raw steel	720,000	576,000	561,000	583,000	605,000
Silver, mine, Ag content	1,494	934	955	1,000 <sup>e</sup>	1,000 <sup>e</sup>
<b>INDUSTRIAL MINERALS</b>					
Barite	--	--	--	2,868	3,000 <sup>e</sup>
Cement, hydraulic <sup>e</sup>	5,860 <sup>r</sup>	5,550 <sup>r</sup>	5,690 <sup>r</sup>	5,760 <sup>r</sup>	6,270
Clay:					
Kaolin	63,829	40,000 <sup>e</sup>	40,000 <sup>e</sup>	40,000 <sup>e</sup>	40,000 <sup>e</sup>
Unspecified	539	966	528	301	310 <sup>e</sup>
Feldspar, mine	253,253	148,506	92,871	43,197	40,000 <sup>e</sup>
Pumice and related materials, pumice	1,008	832	757	800 <sup>e</sup>	800 <sup>e</sup>
Sand and gravel, industrial, silica	84,473	62,230	41,230	105,821	106,000 <sup>e</sup>
Stone, sand and gravel, construction:					
Sand and gravel	6,653	5,379	6,852	2,623	2,700 <sup>e</sup>
Stone, crushed, limestone	3,862	4,532	3,517	3,027	3,100 <sup>e</sup>
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Natural gas, marketable	497	530	463	349	313
Petroleum:					
Crude	198,231	200,711	193,929	188,789	193,816
Refinery:					
Diesel	5,696	5,795	6,052	6,028	4,199
Distillate fuel oil	2,788	11,439	13,686	14,904	13,641
Gasoline	18,461 <sup>r</sup>	17,624 <sup>r</sup>	13,373 <sup>r</sup>	12,506 <sup>r</sup>	12,987
Liquefied petroleum gas	1,522	2,872	2,921	2,653	1,923
Residual fuel oil	8,698	6,872	8,250	10,074	8,330
Other	29,019 <sup>r</sup>	29,971 <sup>r</sup>	33,437 <sup>r</sup>	35,115 <sup>r</sup>	34,546
Total	66,200 <sup>r</sup>	74,600 <sup>r</sup>	77,700 <sup>r</sup>	81,300 <sup>r</sup>	75,600

<sup>e</sup>Estimated. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through October 14, 2020. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>In addition to the commodities listed, bentonite, lead, marble, sulfur, and zeolites may have been produced, but available information was inadequate to make reliable estimates of output.

TABLE 2  
ECUADOR: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		LafargeHolcim Ecuador S.A. (LafargeHolcim Ltd., 92.2%)	Cerro Blanco plant, Guayaquil, Guayas Province, and San Rafael grinding plant, Latacunga, Cotopaxi Province	5,500
Do.		Unión Andina de Cementos, 98.5%	Cement plant near capital city of Quito, Pichincha Province	1,600
Do.		Cemento Chimborazo CA (Unión Cementera Nacional, UCEM, C.E.M), 100%	Riobamba plant, Chimborazo Province	1,000
Do.		C.E.M. Industrial Guapan S.A., 100%	Azogues plant, Cañar Province	600
Copper		Chinese consortium CRCC-Tongling Nonferrous Metals (EcuCorriente S.A.), 100%	Mirador Mine, Zamora Chinchipe Province	96
Gold	kilograms	Lundin Gold Inc., 100%	Fruta del Norte Mine, Zamora Chinchipe Province	10,000
Do.	do.	Bella Rica Mining Cooperative	Bella Rica Mine and La Guanache-Tres de Mayo Mine, Azuay Province	3,000
Do.	do.	Dynasty Metals and Mining Inc., 100%	Zaruma Mine, El Oro Province	2,200
Natural gas	million cubic meters	Empresa Pública de Hidrocarburos del Ecuador (EP Petroecuador) (Government, 100%)	Amistad field, Gulf of Guayaquil	600
<b>Petroleum:</b>				
Crude	thousand 42-gallon barrels	do.	About 26 active oilfields, led by Auca, Orellana Province; and Shushufindi, Napo Province	160,000
Do.	do.	Petroamazonas EP [Empresa Pública de Hidrocarburos del Ecuador (EP Petroecuador) (Government, 100%)]	About 85 active oilfields led by fields in the Amazon basin with operations in Guayas, Napo, Orellana, and Sucumbios Provinces	40,000
Do.	do.	Operaciones Rio Napo [Empresa Pública de Hidrocarburos del Ecuador (EP Petroecuador) (Government, 100%)]	Sacha oilfield, Sucumbios Province	20,000
Refinery products	do.	Empresa Pública de Hidrocarburos del Ecuador (EP Petroecuador) (Government, 100%)	Esmeraldas refinery, Esmeraldas Province	110
Do.	do.	do.	La Libertad refinery, Santa Elena Province	50
Do.	do.	do.	Shushufindi refinery, Sucumbios Province	28

Do., do. Ditto.