



2017–2018 Minerals Yearbook

COLOMBIA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF COLOMBIA

By Jesse J. Inestroza

Note: In this chapter, information for 2017 is followed by information for 2018.

In 2017, Colombia's mining sector entered a new era following the historic 2016 peace agreement between the Government and the country's largest guerilla group. The peace agreement removed significant barriers to mining investment in previously inaccessible areas of the country. During the year, several mining companies conducted copper exploration activities in the country. In 2017, the mineral industry was dominated by the production of coal, copper, emerald, gold, iron and steel, limestone, nickel, natural gas, petroleum, platinum, silver, and sulfur production. In 2017, Colombia's real gross domestic product (GDP) at constant 2010 prices increased by 1.4% compared with a 2.1% increase in 2016. The country's year-on-year GDP rate of growth during the year was 1.4%. Colombia continued to be the leading coal producer in Latin America, with an annual production of 90.9 million metric tons (Mt) of coal in 2017. Colombia was also the only platinum-producing country in Latin America and the world's top emerald producer (Acosta and Murphy, 2017; Green and Stedman, 2017, p. 19; Enerdata, 2018; Ministerio de Minas y Energía, 2018a; World Bank, The, 2018b).

As part of the national program to formalize informal mining, the Colombian Government continued the process of formalizing unlicensed artisanal and small-scale miners (ASM). Unlicensed mining of mineral deposits for such commodities as coal, gold, and construction materials took place in 25 of the 32 Departments (political subdivisions) of the country and has negatively affected the environment, including through water pollution and deforestation. The Departments of Antioquia, Cauca, Choco, Nariño, and the southern region of Bolivar have been most affected by the expansion of illegal mining in the country. The Government was expected to continue processing ASM license applications with the intent to formalize all unlicensed miners by 2032. Licensed miners would be granted legal rights and training as part of the Government's ASM program. As part of a Government-wide initiative to help formalize the ASM sector, gold mine operators, such as Gran Colombia Gold Corp. of Canada, were involved in developing a new contract mining model, which included the creation of cooperatives with formerly illegal miners. The newly formed ASM cooperatives worked in Gran Colombia's concessions and delivered ore to its mill for processing. At the Segovia ASM cooperative, miners brought an average of 15 grams per metric ton (g/t) of material to the mill, for which they were to receive \$450 per troy ounce in payment. In 2017, Gran Colombia had contracts with 41 ASM cooperatives that worked within the company's licensed areas (Lydersen and Cardona-Maguigad, 2015; Ministerio de Minas y Energía, 2017, p. 2; Humphreys, 2018).

Minerals in the National Economy

In 2017, the nominal GDP of Colombia was about \$312 billion compared with \$282.8 billion in 2016. In 2017, Colombia's mining and quarrying sector (including hydrocarbons) accounted for 6.1% of the country's GDP (at 2005 constant prices) compared with 6.4% (revised) in 2016. The country's mining and quarrying sector continued to account for about 2% of the total GDP. In 2017, the value contributed to the GDP from mineral production (including hydrocarbons) was about \$14.4 billion.¹ Coal production was valued at \$3.2 billion, and the production of metallic and nonmetallic minerals was valued at \$1.7 billion. In 2017, the value of total exports from Colombia increased to about \$37.8 billion compared with \$31.0 billion in 2016. The value of the country's mineral export products (excluding hydrocarbons) increased to \$9.8 billion from \$6.8 billion in 2016. Colombia's mineral products accounted for about 26% of total exports in 2017. Coal, which was the country's leading mineral export, accounted for about \$7.4 billion, or 76% of total mineral exports, in terms of value. Gold accounted for about \$1.8 billion; ferronickel, \$361 million; and emerald, \$144.8 million (Ministerio de Minas y Energía, 2018b, p. 116–119; World Bank, The, 2018a).

In 2017, Colombia's foreign direct investment (FDI) inflows totaled about \$15 billion, which was a 4.8% increase compared with those of 2016. About 24% of the country's FDI in 2017 was designated for the hydrocarbon sector. After the country experienced significant FDI declines during the previous 2 years, investments towards the mining sector in 2017 neared \$1 billion, or about 6.6% of the total FDI in the country. Colombia had been noted as one of the best jurisdictions in the region for attracting foreign investment in the extractive industries, such as mining and petroleum extraction. A 2017 report on "Doing Business," published by The World Bank, ranked Colombia 53d out of 190 countries in terms of attracting investment. The report's ease-of-doing-business ranking considers a country's regulatory environment and provides quantitative indicators on regulations for starting a business, dealing with construction permits, getting electricity, registering property, obtaining credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency (Norton Rose Fulbright, 2017, p. 2; World Bank, The, 2017, p. 7, 14; 2018a; Ministerio de Minas y Energía, 2018b, p. 117).

¹Where necessary values have been converted from Colombian pesos (COP\$) to U.S. dollars (US\$) at an annual average exchange rate of COP\$3,001.50=US\$1.00 for 2016 and COP\$2,981.79=US\$1.00 in 2017.

Production

Notable increases in Colombia's mineral commodity production in 2017 compared with that of 2016 included that of coke, which increased by 38%, and copper and nickel, which increased by 10% each. Decreases in mineral production included that of platinum, which decreased by 38%; bentonite, by 37%; emerald, by 33%; gold and phosphate, by 32% each; and pig iron, by 10%. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Ministry of Mines and Energy (MME) was responsible for the administration of the mining sector, including implementing national policies on exploration, extraction, transportation, refining, processing, transformation, and distribution of minerals and hydrocarbons. In 2017, most mining operations in Colombia were privately owned, although the natural gas and petroleum operations and facilities were Government owned (Agencia Nacional de Minería, 2015, p. 26). Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Copper.—Copper production in Colombia increased by 10% to 9,355 metric tons (t) in 2017. The El Roble Mine (Atico Mining Corp., 90%, and Minera El Roble S.A. [MINER], 10%) was Colombia's only commercial copper mine in production in 2017. This year saw the highest annual production to date, attributed mainly to the processing of 6% more ore and a 4% increase in the copper head grade. Produced copper was transported by truck to the Port of Buenaventura, a seaport city in the Department of Valle del Cauca and the main port of Colombia on the Pacific coast. MINER's principal asset was the El Roble underground copper-gold-silver mine and processing plant, located in Choco, Colombia. The MINER operation consisted of eight mineral concession areas covering a total of 6,679 hectares (ha) (Atico Mining Corp., 2018, p. 2, 4–5).

In December 2015, MINER received notice of claim from Colombia's National Mining Agency (ANM) requesting payment of royalties related to past copper production at the mine. MINER's position was that it had complied with royalty payments required under the original executed contract, whereas the ANM based its notice on subsequent mining law. The claim against MINER of approximately \$2 million had yet to be resolved as of December 31, 2017 (Atico Mining Corp., 2018, p. 17).

Gold.—In 2017, gold production in Colombia decreased by 32% to 42,100 kilograms (kg). Despite the decrease in production, partly owing to control measures implemented by the Government to formalize the gold-mining sector, the value of gold exports remained about the same. Gold production in the country was sourced mostly from artisanal-scale operations. The production of gold in Colombia was, however, expected to increase as the Government approved three large-scale gold projects that would add an estimated 20,000 kg of gold to the country's total annual production once operations began. Continental Gold Ltd.'s Buritica project, which was scheduled

to reach full production in 2021, was expected to be Colombia's leading producing gold mine, with annual production of about 8,000 kg (table 1; Medellín Herald, 2018; Ministerio de Minas y Energía, 2018b, p. 17, 118, 120).

Gold production from Gran Colombia Gold's Segovia and Marmato operations was 4,624 kg and 783 kg, respectively. Gran Colombia Gold was the country's largest underground gold and silver producer in 2017, with several underground mines and two processing plants in operation. Located in Antioquia Department, the Segovia operation announced an updated mineral resource estimate effective December 31, 2017, after it completed approximately 17,500 meters of drilling. Estimated total measured and indicated resources increased to 3.4 Mt at an average grade of 11.4 g/t, representing 1.2 million ounces of gold in measured and indicated resources; this estimate was up 13% compared with the mineral resource estimate released earlier in the year. Segovia's gold production increased by 18% compared with that of 2017 owing mainly to higher average head grades. Gold production at the Marmato project, which is located at Caldas Department, increased by 7% compared with that of 2016. Gold production at Marmato was expected to remain at about the same level as in 2018 (Gran Colombia Gold Corp., 2018).

Nickel.—In 2017, Colombia was estimated to be the fourth-ranked nickel producer in Latin America, accounting for 2.3% of world nickel production. Colombia's nickel production increased 9.5% compared with that of 2016, to 40,600 t. Since 2014, on average, nickel had accounted for about 1% of the value of the country's total exports. Colombia's main source of nickel was located within Cordoba Department in northern Colombia. Other nickel prospects and occurrences in the country occur in Antioquia Department. The country's only nickel production came from Cerro Matoso S.A.'s La Emeraldita deposit in Montelibano. Discovered in the 1940s, Cerro Matoso was an open pit lateritic nickel mine. The operation included a ferronickel smelter that had been in operation since 1982. The mine had a production capacity of 50,000 metric tons per year. According to mine officials, Cerro Matoso was expected to increase nickel production in 2018 and 2019 (tables 1, 2; Agencia Nacional de Minería, 2015, p. 12; 2018c; Garcia, 2017; Ministerio de Minas y Energía, 2018b, p. 118).

Industrial Minerals

Cement.—In 2017, cement production by all companies in Colombia decreased by 1.6% to 12.3 Mt, and shipments decreased slightly to 12.0 Mt. Shipments for Cementos Argos Colombia S.A. (Argos), however, increased by 4% to 5.3 Mt. Argos was a leading producer of cement in the country, with a market share of 70%, and it employed 4,228 people during the year. Marketed cement shipments increased slightly to 6.4 Mt; shipments to concrete plants decreased by 5.1% to 2.6 Mt; and shipments to construction and contracting businesses decreased by 2.4% to 2.4 Mt. All other shipments were received or consumed by manufacturers of fiber cement and prefabricated products (Cementos Argos S.A., 2018, p. 23; Departamento Administrativo Nacional de Estadística, 2018).

Empresa Colombiana de Cementos (Ecocementos), which was a joint venture between Spain's Cementos Molins and

Grupo Corona, began construction of a 1.35-million-metric-ton-per-year cement plant located in Antioquia Department. The plant was expected to be completed in mid-2019 and would create 450 direct and indirect jobs. Ecocementos was expected to capture up to 7% of the cement market (El Tiempo, 2017).

Gemstones.—Colombia remained the world's top-ranked emerald producer in 2017, accounting for about 70% of world emerald production. Colombia's emerald production during the year, however, decreased by 33% to 2,412 thousand carats compared with 3,578 thousand carats (revised) in 2016. Emerald production in the country accounted for almost 2% of total mineral exports, in terms of value. Colombian emerald deposits occur in the Eastern Ranges of the Colombian Andes Mountains. Most of the emerald mined in the country came from the Muzo formation and the Coscuez Mine in the San Pablo de Borbur Municipality (table 1; Agencia Nacional de Minería, 2018b; Fura Gems Inc., 2017, p. 5, 11).

In 2017, Canada's Fura Gems Inc. (formerly Fura Emeralds Inc.) entered into a purchase agreement to acquire a 76% stake in the Coscuez emerald mine from Colombia's Esmeracol S.A. License 122–95M was granted for an initial period of 30 years; it was slated to expire in December 2020 but could be extended by an additional 30 years following negotiations with the Government. The license covers an area of 43 ha and included exclusive rights for emerald exploration and mining and for the construction of mining and processing facilities. There were no current mineral resource estimates for the deposit (table 1; Fura Gems Inc., 2017, p. 5, 34).

Mineral Fuels

Coal.—In 2017, Colombia's coal production decreased slightly to 90.9 Mt. The Cesar and La Guajira Departments produced 50.7 Mt and 32.1 Mt of coal, respectively, accounting for a combined total of about 90% of the coal produced in the country. The country's coal production continued to be dominated by the following two major coal companies: Carbones del Cerrejón LLC and Drummond Ltd. of the United States. Cerrejón was a joint venture of Anglo American plc of the United Kingdom (33.3%), BHP Billiton Group (33.3%), and Glencore plc of Switzerland (33.3%) (table 2; Sistema de Información Minero Colombiano, 2018, p. 142).

In 2017, Cerrejón produced 31.9 Mt of coal, or about 35% of the country's output, and exported a total of 31.7 Mt. Production and exports of coal at Cerrejón decreased in 2017 owing in part to heavy rainfall in the region. During the year, Colombia's Constitutional Court suspended operations at Cerrejón's newly developed project, La Puente pit. The court cited environmental and social concerns at La Puente, which had the potential to produce an estimated 2 Mt annually. Court litigation at Cerrejón was ongoing at yearend (Cala, 2018; Cerrejón Carbon LLC, 2018, p. 8–10).

Petroleum.—In 2017, petroleum production in Colombia decreased by 3.4% to 311.6 million barrels compared with that of 2016. The Colombian state-owned oil company Ecopetrol S.A. met its 2017 production goal of 715,000 barrels of oil equivalent per day (boe/d), which included 124 boe/d of natural gas. The company's exploration activities continued as it ended the year

with a record of 21 wells drilled. In 2017, refinery production in the country reached a new high of 346,000 barrels per day owing to stable output at the Barrancabermeja and Cartagena refineries. There were 2 billion barrels of proven crude petroleum reserves at yearend 2017 in the country, which was a 13% decrease compared with reserves in 2016. The petroleum industry in Colombia received FDI of about \$3.5 billion in 2017. The country had 25 active oil rigs compared with 19 in 2016, and it exported about 68% of its crude petroleum production during the year (Organization of the Petroleum Exporting Countries, 2018, p. 27, 42; Ecopetrol S.A., 2018a, p. 1, 3, 15–16; 2018b, p. 11; Ministerio de Minas y Energía, 2018b, p. 117).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

In 2018, the mineral industry of Colombia remained a significant contributor to the country's economy and continued to be a leading producer of minerals in Latin America. Since 2010, the country's mineral sector (not including hydrocarbons) had averaged about 2% of the annual GDP, accounted for about 20% of total exports in terms of value, and received 13% of the total FDI. For the year, Colombia was the world's leading emerald producer and the region's leading and the world's fifth-ranked coal producer. Colombia's mineral products accounted for 23% of total exports. Coal, which was the country's leading mineral export product, accounted for 73% of total mineral exports, in terms of value; gold, 18.5%; nickel, 5.7%; emerald, 1.3%; and other minerals, 1.2%. Other minerals produced in the country included bentonite, copper, iron ore, nickel, phosphate rock, platinum, salt, and silver. Mineral fuels produced included coke, natural gas, and petroleum (Ministerio de Minas y Energía, 2019, p. 39–40).

In 2018, the nominal GDP of Colombia was \$333 billion compared with \$312 billion in 2017. Overall GDP growth was estimated to have increased by 2.5% during the year. Colombia's mineral industry attracted about \$1.5 billion or almost 19% of the country's total FDI in 2018 (excluding hydrocarbons). The petroleum industry was the sector that attracted the most FDI to Colombia, receiving almost \$2.5 billion in 2018. According to the country's finance minister, the Government would provide up to \$580 million in tax incentives during the next 4 years to attract investment in mining and petroleum exploration. Canada's Continental Gold, which was developing the \$512 million Buritica gold-silver project in Antioquia Department, announced that commercial production was scheduled to commence in 2020. Buritica had a projected mine life of 14 years and an estimated annual gold production capacity of 9,300 kg. Buritica was considered one of the largest and highest-grade new gold projects in the world. Cordoba Minerals Corp., a Canadian mineral exploration company, continued exploring the San Matias copper-gold-silver project, which included the El Alacran deposit and satellite deposits at Montiel East, Montiel West, and Costa Azul, located in Cordoba Department. Colombia hosts porphyry copper deposits similar to those typically found in the Andes Mountains (Banco Central de Colombia, 2018; Business News America, 2018; World Bank, The, 2018a, b; Continental Gold Ltd., 2019, p. 2, 7; Cordoba Minerals Corp., 2019; Ministerio de Minas y Energía, 2019, p. 40–41, 137–138).

Increases in mineral production in 2018 compared with that of 2017 included that of bentonite, by 92%; silver, by 46%; salt (rock), by 16%; and limestone, by 11%. Decreases in mineral production included that of platinum, by 53%; iron ore, by 20%; gold, by 16%; and emerald, by 12%. Emerald was the only mineral commodity with notable decreases in production in both 2017 and 2018. These and other production data are in table 1.

Outlook

Because of its geology and associated mineral potential, and the recent political stability resulting from Government peace agreements with local guerillas, Colombia's mineral industry is expected to grow with the receipt of increased FDI in the coming years. The country has great potential for new discoveries, as less than 4% of Colombia's national territory has been explored for minerals. In addition, Colombia is strategically located given its proximity to the Panama Canal and access to the Atlantic Ocean and the Pacific Ocean. With nearly 8,400 mining titles granted in 2017, of which 41% pertained to construction materials; 21%, to gold and precious metals; 16%, to coal; and 4%, to emerald, Colombia's coal exports are expected to represent a smaller percentage of total mineral exports. Colombia will continue to work to overcome significant challenges in formalizing the country's small-scale-mining sector at the same time that local stakeholders in the region look to minimize land deforestation and pollution. The country is expected to continue engaging with communities to avoid social and environmental conflicts with the mineral industry. Although mining in Colombia has historically focused on coal, emerald, and gold operations, an interest in other minerals, such as copper, is likely to increase. Ongoing interest in mineral exploration, mainly in the Departments of Antioquia, Choco, Cordoba, Huila, Nariño, Risaralda, Santander, and Tolima, is expected to help keep expanding Colombia's mineral industry (Agencia Nacional de Minería, 2018a, p. 11; Ministerio de Minas y Energía, 2019, p. 41).

References Cited

- Acosta, L.J., and Murphy, H., 2017, Colombia's mining sector could receive \$1.5 billion annually over five years: Thomson Reuters, May 16. (Accessed April 23, 2020, at <https://www.reuters.com/article/us-colombia-mining-idUSKCN18C2KR>.)
- Agencia Nacional de Minería [National Mining Agency], 2015, Exploring opportunities: Bogota, Colombia, Agencia Nacional de Minería, 52 p. (Accessed December 16, 2018, at https://www.anm.gov.co/sites/default/files/DocumentosAnm/publication_exploring_opportunities.pdf.)
- Agencia Nacional de Minería [National Mining Agency], 2018a, Colombia exploring opportunities: Bogota, Colombia, Agencia Nacional de Minería, 23 p. (Accessed December 21, 2018, at https://www.anm.gov.co/sites/default/files/cartilla_anm_2018_pqliogo.pdf.)
- Agencia Nacional de Minería [National Mining Agency], 2018b, Esmeraldas [Emeralds]: Bogota, Colombia, Agencia Nacional de Minería. (Accessed December 20, 2018, at http://mineriaencolombia.anm.gov.co/images/MINERALES2017/ficha_esmeraldas_es_FINAL_.pdf.) [In Spanish.]
- Agencia Nacional de Minería [National Mining Agency], 2018c, Nickel: Bogota, Colombia, Agencia Nacional de Minería. (Accessed December 17, 2018, at http://mineriaencolombia.anm.gov.co/images/MINERALES2017/FICHA-niquel_espanol.pdf.)
- Atico Mining Corp., 2018, Management's discussion & analysis for the year ended December 31, 2017: Vancouver, British Columbia, Canada, Atico Mining Corp., 29 p. (Accessed December 17, 2018, at <http://aticomining.com/resources/financials/ATY-2017Q4-MDA-FINAL.pdf>.)
- Banco Central de Colombia, 2018, Inversión directa [Direct investment]: Banco Central de Colombia. (Accessed November 5, 2020, via <https://www.banrep.gov.co/es/estadisticas/inversion-directa>.) [In Spanish.]
- Business News America, 2018, Colombia announces oil, mining tax breaks: Business News Americas, March 26. (Accessed November 06, 2019, at <https://www.bnamericas.com/en/news/colombia-announces-oil-mining-tax-breaks/>.)
- Cala, A., 2018, Cerrejon coal output may fall 12.5% below target in 2019: Montel News [Bogota, Colombia], October 3. (Accessed December 21, 2018, at <https://www.montelnews.com/en/story/cerrejon-coal-output-may-fall-125-below-target-in-2019/940344>.)
- Cementos Argos, S.A., 2018, Annual shareholders report 2017: Medellín, Colombia, Cementos Argos, S.A., 305 p. (Accessed December 20, 2018, at <http://ir.argos.co/en/Financial-information/Reports>.)
- Cerrejón Carbon LLC, 2018, Informe de sostenibilidad 2017 [Sustainability report 2017]: Bogota, Colombia, Cerrejón Carbon LLC, 103 p. (Accessed December 21, 2018, at <https://www.cerrejon.com/sites/default/files/2021-08/informe-de-sostenibilidad-2017.pdf>.) [In Spanish.]
- Continental Gold Ltd., 2019, Corporate presentation 2019: Toronto, Ontario, Canada, Continental Gold Ltd., 51 p. (Accessed November 9, 2019, at https://www.continentalgold.com/wp-content/uploads/2019/11/CNL_Corporate_PPT_14-11-19_small.pdf.)
- Cordoba Minerals, 2019, San Matias: Vancouver, British Columbia, Canada, Cordoba Minerals. (Accessed November 10, 2019, at <http://www.cordobaminerals.com/projects/san-matias>.)
- Departamento Administrativo Nacional de Estadística [National Administrative Department of Statistics], 2018, Estadísticas de cemento gris—Diciembre 2018 [Gray cement statistics, annexes—December 2018]: Departamento Administrativo Nacional de Estadística. (Accessed December 19, 2018, at <http://www.dane.gov.co/index.php/estadisticas-por-tema/construccion/estadisticas-de-cemento-gris/historicos-estadisticas-de-cemento-gris>.) [In Spanish.]
- Ecopetrol S.A., 2018a, Ecopetrol Business Group presents its 2017 fourth-quarter and full-year results: Bogota, Colombia, Ecopetrol S.A., 38 p. (Accessed December 21, 2018, at <https://nuevoportal.ecopetrol.com.co/documentos/inversionistas/4Q%202017.pdf>.)
- Ecopetrol S.A., 2018b, Integrated sustainable management report 2017—We are oil—Done well and for all: Bogota, Colombia, Ecopetrol S.A., 745 p. (Accessed December 21, 2018, at <https://storagestreamecp.blob.core.windows.net/doc/sustainability-report-2017.pdf>.)
- El Tiempo, 2017, Las empresas de cemento tienen planes concretos [Cement companies have concrete plans]: El Tiempo [Bogota, Colombia], January 17, 2017. Bogota, Colombia (Accessed December 19, 2018, at <https://www.eltiempo.com/colombia/medellin/las-empresas-de-cemento-tienen-planes-concretos-29011>.) [In Spanish.]
- Enerdata, 2018, Global energy statistical yearbook 2018—Coal and lignite production: Grenoble, France, Enerdata, 2017. (Accessed December 14, 2018, at <https://yearbook.enerdata.net/coal-lignite/coal-production-data.html>.)
- Fura Gems Inc., 2017, Technical report on the 122-95M Emerald license in the Boyacá District, Colombia: Toronto, Ontario, Canada, Fura Gems Inc., November 15, 46 p. (Accessed December 20, 2018, at <http://www.furagems.com/uploads/Colombia-Technical-Report-by-Competent-Person.pdf>.)
- García, Eduardo, 2017, Minminas pasó revista en Cerro Matoso e inauguró CDI para 380 niños [Minminas reviewed Cerro Matoso and inaugurated CDI for 380 children]: El Heraldo [Bogota, Colombia], November 9. (Accessed December 18, 2018, at <https://www.elheraldo.co/cordoba/minminas-paso-revista-en-cerro-matoso-e-inauguro-cdi-para-380-ninos-421218>.) [In Spanish.]
- Gran Colombia Gold Corp., 2018, Gran Colombia Gold reports fourth quarter and full year 2017 results; turnaround doubles adjusted EBITDA to \$75.5 million in two years; reports first mineral reserve for its Segovia operations: Toronto, Ontario, Canada, Gran Colombia Gold Corp. press release, March 27. (Accessed December 16, 2018, at <http://www.grancolombiagold.com/news-and-investors/press-releases/press-release-details/2018/Gran-Colombia-Gold-Reports-Fourth-Quarter-and-Full-Year-2017-Results-Turnaround-Doubles-Adjusted-EBITDA-to-755-Million-in-Two-Years-Reports-First-Mineral-Reserve-for-its-Segovia-Operations/default.aspx>.)

- Green, K.P., and Stedman, Ashley, 2017, Survey of mining companies 2017: Vancouver, British Columbia, Canada, Fraser Institute, 68 p. (Accessed December 14, 2018, at <https://www.fraserinstitute.org/sites/default/files/survey-of-mining-companies-2017.pdf>.)
- Humphreys, Tommy, 2018, Investigation—The turnaround at Gran Colombia Gold: Montreal, Quebec, Canada, Kitco Metals Inc., November 14. (Accessed December 14, 2018, at <https://www.kitco.com/commentaries/2017-11-14/INVESTIGATION-The-Turnaround-at-Gran-Colombia-Gold.html>.)
- Lydersen, K., and Cardona-Maguigad, A., 2015, Survival, profit, and war—The many faces of gold mining in Colombia (Pt. 1): New York, New York, The North American Congress on Latin America. (Accessed December 14, 2018, at <https://nacla.org/news/2015/11/09/survival-profit-and-war-many-faces-gold-mining-colombia>.)
- Medellin Herald, 2018, Antioquia will continue to dominate gold mining in Colombia—CGS highlights: Medellin [Colombia] Herald, November 23. (Accessed December 21, 2018, at <http://www.medellinherald.com/antioquia/mmn/item/664-antioquia-will-continue-to-dominate-gold-mining-in-colombia-cgs-highlights>.)
- Ministerio de Minas y Energía, 2017, Normatividad general para el control de la explotación ilícita de minerales [General regulations for the control of illicit exploitation of minerals]: Bogota, Colombia, Ministerio de Minas y Energía, 31 p. (Accessed December 14, 2018, at https://www.minenergia.gov.co/documents/10192/23876760/120417_cartilla_norma_ctrl_explotacion_ilicita.pdf/3a88a8ce-8e17-415d-ac6b-87f474cc304d.) [In Spanish.]
- Ministerio de Minas y Energía, 2018a, History of news—Coal, peace and development, Colombian slogans in Europe: Bogota, Colombia, Ministerio de Minas y Energía. (Accessed December 12, 2018, at <https://www.minminas.gov.co/en/web/11801/noticias?idNoticia=23940028>.) [In Spanish.]
- Ministerio de Minas y Energía, 2018b, Memorias al Congreso de la República 2017–2018 [Report to Congress 2017–2018]: Bogota, Colombia, Ministerio de Minas y Energía, p. 248 p. (Accessed December 14, 2018, at https://www.minenergia.gov.co/documents/10192/24023113/190718_mem_congreso_2017_2018_completa.pdf/da770040-6651-441b-8a5b-a9e01da37439.) [In Spanish.]
- Ministerio de Minas y Energía, 2019, Memorias al Congreso de la República 2018–2019 [Report to Congress 2018–2019]: Bogota, Colombia, Ministerio de Minas y Energía, 175 p. (Accessed November 06, 2019, at <https://www.minenergia.gov.co/documents/10192/24136905/Memorias+Congreso+MME+2018-2019+%282%29.pdf#page=5>.) [In Spanish.]
- Norton Rose Fulbright, 2017, Colombia mining vision by 2025: Bogota, Colombia, Norton Rose Fulbright, 33 p. (Accessed December 15, 2018, at https://acmineria.com.co/acm/wp-content/uploads/2018/10/31102016_colombia_mining_vision_by_2025_vf_0.pdf.)
- Organization of the Petroleum Exporting Countries, 2018, Annual statistical bulletin 2017: Vienna, Austria, Organization of the Petroleum Exporting Countries, 132 p. (Accessed December 21, 2018, via https://www.opec.org/opec_web/en/publications/202.htm.)
- Sistema de Información Minero Colombiano, 2018, Boletín estadístico de minas y energía 2018 [Statistical bulletin of mines and energy 2018]: Sistema de Información Minero Colombiano. (Accessed December 21, 2018, at http://www1.upme.gov.co/PromocionSector/SeccionesInteres/Documents/Boletines/Boletin_Estadistico_2018.pdf.) [In Spanish.]
- World Bank, The, 2017, Doing business—Comparing business regulation for domestic firms in 190 economies: The World Bank, 346 p. (Accessed November 3, 2020, at <https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB17-Report.pdf>.)
- World Bank, The, 2018a, Data bank—Indicators, GDP current US \$: The World Bank. (Accessed May 1, 2020, at <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=CO>.)
- World Bank, The, 2018b, Data bank—Indicators, GDP growth: The World Bank. (Accessed October 25, 2019, at <http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=CO>.)

TABLE 1
COLOMBIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²		2014	2015	2016	2017	2018
METALS						
Copper, mine, concentrates, Cu content		4,118	5,463	8,493 ^r	9,355	9,920
Gold, mine, Au content	kilograms	57,015	59,202	61,805	42,100	35,560
Iron ore, mine:						
Gross weight	thousand metric tons	676	902	716	713	572
Fe content	do.	406	541	429 ^r	428	344
Iron and steel:						
Pig iron	do.	234	240	225	203	205
Steel, raw steel	do.	1,208	1,211	1,272	1,253	1,219
Ferroalloys, ferronickel, Ni content		41,221	36,671	37,092	40,600	43,100
Platinum, mine, Pt content	kilograms	1,142 ^r	861	917 ^r	566	269
Silver, mine, Ag content	do.	11,498	10,155	10,427	10,922	15,967
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	12,384	13,153	12,495	12,299	12,452
Clay, bentonite		24,873 ^r	139,144 ^r	105,899 ^r	66,869	128,109
Gemstones, emerald	thousand carats	2,308 ^r	2,263 ^r	3,578 ^r	2,412	2,128
Phosphate rock:						
Gross weight	thousand metric tons	42 ^r	95 ^r	66 ^r	45	49
P ₂ O ₅ content ^c	do.	9 ^r	27 ^r	13 ^r	14	15
Salt:						
Rock salt		494,185 ^r	334,804 ^r	354,373 ^r	336,373	391,222
Sea salt		36,786 ^r	95,652 ^r	176,021 ^r	165,126	170,000 ^e
Stone, crushed, limestone	thousand metric tons	15,374	15,757 ^r	18,252 ^r	16,608	18,487
Sulfur, native, S content		48,513	76,239	76,331	76,000 ^e	76,000 ^e
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	83,263	80,415	85,596 ^r	85,421	80,293
Metallurgical	do.	5,315	5,133	5,464 ^r	5,452	5,144
Coke, metallurgical	do.	2,345	2,164	2,043	2,821	2,800 ^e
Natural gas	million cubic meters	12,680	11,910 ^r	10,400 ^r	9,600	9,599
Petroleum:						
Crude	thousand 42-gallon barrels	361,460	367,044	322,405	311,564	315,798
Refinery, products	do.	86,505	84,680	120,450	126,900	136,145

^eEstimated. ^rRevised. do. Ditto.

¹Table includes data available through November 26, 2019. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the commodities listed, other clays, feldspar, gypsum, magnesite, sand and gravel, secondary iron, semimanufactured steel, thorium, and uranium may have been produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity	
Cement	Cía. Colombiana de Clinker S.A. (Cementos Argos Colombia S.A., 100%)	Plant at Cartagena, Bolivar Department	1,250	
Do.	Cementos del Caribe S.A. (Cementos Argos Colombia S.A., 74%)	Barranquilla, Atlantico Department	1,500	
Do.	Cementos del Valle S.A. (Cementos Argos Colombia S.A., 70%)	Yumbo, Valle del Cauca Department	1,500	
Do.	Cales y Cementos de Toluviéjo S.A. (Cementos Argos Colombia S.A., 95%)	Toluviéjo, Sucre Department	980	
Do.	Cementos del Nare S.A. (Cementos Argos Colombia S.A., 100%)	Puerto Nare, Antioquia Department	210	
Do.	Cementos El Cairo S.A. (Cementos Argos Colombia S.A., 100%)	Montebello, Antioquia Department	450	
Do.	Cementos Paz del Río S.A. (Cementos Argos Colombia S.A., 62%)	Belencito, Boyaca Department	880	
Do.	Cementos Ríoclaro S.A. (Cementos Argos Colombia S.A., 99%)	Sonson, Antioquia Department	1,400	
Do.	Cementos Boyacá S.A. (LafargeHolcim Group, 100%)	Nobsa, Boyaca Department	1,500	
Do.	CEMEX Colombia S.A. (CEMEX S.A.B. de C.V., 99.7%)	Bucaramanga, Santander Department; Buenos Aires, Tolima Department; Pamplona, Norte de Santander Department; La Calera, Cundinamarca Department	3,980	
Coal	Carbones del Cerrejón LLC (Anglo American plc, 33.3%; BHP Billiton Group, 33.3%; Glencore plc, 33.3%)	Cerrejon Centro, Cerrejon Sur, Cerrejon Zona Norte, and Oreganal Mines, La Guajira Department	32,000	
Do.	Drummond Ltd. (Drummond Co. Inc., 80%, and Itochu Corp., 20%)	La Loma Mine, Cesar Department	20,000	
Do.	do.	El Descanso Mine, Cesar Department	12,000	
Do.	Glencore plc, 100%	Calenturitas Mine, Cesar Department	16,000	
Do.	do.	La Jagua Mine, Cesar Department	7,000	
Do.	Pacific Coal Resources Ltd., 100%	La Caypa Mine, La Guajira Department	1,300	
Do.	do.	Cerro Largo Mine, Cesar Department	600	
Do.	Colombia Energy Resources, 100%	Ruku Mine, Boyaca Department	80	
Do.	Continental Coal Ltd., 50%	Colombia Mine, Guainia Department	NA	
Do.	Carbones San Fernando S.A., 100%	San Fernando Mine, Antioquia Department	330	
Do.	Mineral & Rocks Corp., 100%	Boyaca Mine, Boyaca Department	50	
Do.	Colombian Natural Resources, 100%	El Hatillo Mine, Cesar Department	3,600	
Do.	Glencore plc, 100%	Prodeco Mine, Cesar Department	14,500	
Do.	CarboCoque, 100%	Soacha Mine, Cundinamarca Province	3,000	
Do.	Colombia Natural Resources, 100%	El Hatillo Mine, Cesar Province	1,800	
Do.	Andean Coal (BVI) Ltd., 51%, and Carbid SAS, 49%	Escalones Mine, Boyaca Department	NA	
Copper	metric tons	Atico Mining Corp., 90%, and Minera El Roble S.A., 10%	El Roble Mine, El Carmen, Choco Department	9,950
Gemstones, emerald		Fura de Colombia S.A. (Fura Gems Inc., 76%, and other investors, 24%)	Coscuez Mine, Boyaca Department	NA
Do.		Mineria Texas Colombia S.A., 100%	Muzo Mine, Boyaca Department	NA
Gold	kilograms	Gran Colombia Gold Corp., 90%, and Investcol Ltd., 10%	Segovia Operations, Antioquia Department, 220 kilometers northeast of Medellin, including El Silencio Mine, Providencia Mine, and Sandra K Mine; Carla Mine, 10 kilometers southeast of Segovia operations	2,800
Do.	do.	do.	Marmato Mine, Caldas Department, 80 kilometers south of Medellin	850

See footnotes at end of table.

TABLE 2—Continued
 COLOMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gold—Continued	kilograms	Mineros S.A., 100%	Antioquia Mine (Mina La Ye), Antioquia Department, 50 kilometers northwest of Medellin	4,200
Do.	do.	Atico Mining Corp., 90%, and Minera El Roble S.A., 10%	El Roble Mine, El Carmen, Choco Department	300
Do.	do.	NA	Rafael Mine, Antioquia Department	NA
Do.	do.	Red Rock Resources Plc, 50%	El Mango Mine, Antioquia Department	NA
Do.	do.	Private interest	Suarez Mine, Cauca Department	NA
Do.	do.	Mineras Nacionales SA, 100%	Zona Baja Mine, Caldas Department	NA
Do.	do.	Cordillera Gold, Ltd., 100%	Santa Paublina, Antioquia Department	NA
Iron and steel, steel		Diaco S.A. (Gerdau S.A.)	Tuta and Duitama, Boyaca; Cali, Valle del Cauca; Tocancipa, Cundinamarca; Muna, near Bogota	NA
Iron ore		Acerías Paz del Río S.A. (Votorantim Industrial, S.A., 82.42%)	El Uvo, Pírgua, and Ubalá Mines, Boyaca Department	200
Do.		Votorantim Industrial S.A., 82.42%	Paz del Río Mine, Boyaca Department	720
Natural gas	million cubic meters	Ecopetrol S.A. (Government, 100%)	North coast, La Guajira Department (national gasfields)	13,000
Nickel		Cerro Matoso S.A. (South32 Ltd., 99.94%, and mine workers, 0.06%)	Cerro Matoso Mine and ferronickel smelter, Montelibano, Cordoba Department	50
Petroleum	thousand 42-gallon barrels	Ecopetrol S.A. (Government, 100%)	116 fields in various Departments	330,000
Petroleum products	do.	do.	Barrancabermeja refinery, Norte de Santander Department	100,000
Do.	do.	do.	Cartagena refinery, Bolivar Department	40,000
Silver	kilograms	Gran Colombia Gold Corp., 90%, and Investcol Ltd., 10%	Marmato Mine, Caladas Department, 80 kilometers south of Medellin	40,400

Do., do. Ditto. NA Not available.