



2017–2018 Minerals Yearbook

VENEZUELA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF VENEZUELA

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

Venezuela accounted for 2% of global crude petroleum production in 2017 and was the second-ranked petroleum producing country in the Latin America and the Caribbean region after Brazil, which accounted for nearly 3% of total global output. Proven petroleum reserves in Venezuela represented 18% of the world's total proven petroleum reserves, which was the largest share in the world, followed by Saudi Arabia (16%), Canada (10%), Iran (9%), and Iraq (9%). About 74% of Venezuela's proven crude petroleum reserves consisted of extra-heavy crude petroleum in the Orinoco Belt, a region that covers more than 50,000 square kilometers in northeastern Venezuela that is underlain by an estimated 1 trillion barrels of heavy oil-in-place. Venezuela's natural gas production in 2017 accounted for about 1% of global natural gas production, and the country held nearly 3% of the world's proven natural gas reserves. The most significant nonfuel mineral and mineral-based commodities in Venezuela in 2017 were alumina, aluminum, bauxite, cement, gold, and iron and steel. Other nonfuel mineral commodities produced included clay (kaolin), feldspar, nitrogen (ammonia), phosphate rock, refined lead, sand, and silicomanganese. Venezuela produced about 1% of the global supply of direct-reduced iron (table 1; U.S. Geological Survey, 2009; BP p.l.c., 2018, p. 12, 14, 26, 28; World Steel Association, 2018, p. 95).

Minerals in the National Economy

Venezuela's debt was estimated to be about \$150 billion by the end of 2017 compared with a revised \$149.9 billion in 2016. Estimates from the Economic Commission for Latin America and the Caribbean (ECLAC) indicated that Venezuela's gross domestic product (GDP) shrank for the fourth straight year in 2017. The International Monetary Fund (IMF) reported that Venezuela's GDP based on purchasing power parity was estimated to be about \$381 billion in 2017 compared with \$435 billion in 2016, which was a decrease of about 12%. According to crude petroleum data reported by BP p.l.c., Venezuela's production had decreased during the past 10 years, with a modest exception in 2014, and the trend was expected to continue in 2018 (Economic Commission for Latin America and the Caribbean, 2018b, p. 1; 2019a, p. 204; BP p.l.c., 2019; International Monetary Fund, 2019).

The mining and quarrying sector's contribution to real GDP decreased to about 25% in 2014 (the latest year for which data were available) from a high of 42% in 2003. The mineral sector was the only sector of the economy that had a decline in the value of real GDP between 2000 to 2014, decreasing by about 12% to \$63.4 billion in 2014 from \$72.2 billion in 2000 (in constant 2010 dollars) (Economic Commission for Latin America and the Caribbean, 2018a).

The United Nations Conference on Trade and Development reported that Venezuela's foreign direct investment (FDI) increased to \$1.77 billion in 2016 (the latest year for which data were available) from \$1.59 billion in 2015 and \$320 million in 2014. FDI was still far below the 5-year high of \$5.97 billion in 2012, however. The ECLAC noted that the uncertain political and economic situation in Venezuela had negatively affected future investments in the country. Although no investment data in Venezuela had been available since 2015, it is presumed that investments decreased, affecting not only mining and quarrying but the production of crude petroleum as well. Venezuela continued to receive some FDI, however; in July 2017, the Government announced three investment agreements valued at a total of \$1.16 billion, which were focused mainly on the expansion of mining activities in the country. These agreements included the refurbishing of mining and port infrastructure at the Carbones de Zulia, S.A (Carbozulia) coal project in Zulia State at a cost of \$400 million. Carbozulia, which was a state-owned company, was partnering with CAMC Engineering Co. of China, Inter-American Coal of Colombia, and Yuankuang Group of China for the development of the project. The second agreement involved the investment of \$180 million to initiate nickel mining in the States of Aragua and Miranda in partnership with CAMC Engineering and Yuankuang Group. The third agreement was signed by the Compañía Autónoma Militar de Industrias Mineras, Petrolíferas, y de Gas, C.A. (CAMIMPEG), which was a Government-owned company partnering with undisclosed local investment firms and companies from China to provide services for mining and natural gas production to CAMIMPEG (Koerner, 2017; United Nations Conference on Trade and Development, 2017, p. 224; Economic Commission for Latin America and the Caribbean, 2018c, p. 53).

Government Policies and Programs

In March 2017, the Government of Venezuela enacted three decrees, which were published in Venezuela's Official Gazette no. 41.122, in which diamond (Decree No. 2,781), copper (Decree No. 2,782), and silver (Decree No. 2,783) were declared to be strategic minerals. Strategic minerals are subject to the rules and regulations provided in the Decree of Rank, Value and Force of the Organic Law, which establishes that the Government has the sole right to explore for and mine strategic minerals (Ministerio del Poder Popular de Desarrollo Minero Ecológico, 2018).

The Zona de Desarrollo Estratégico Nacional Arco Minero del Orinoco [National Strategic Development Zone of the Orinoco Mining Arc] was established by Decree No. 2,248 in February 2016. According to the decree, a previously protected area of nearly 112,000 km² would be opened for mining.

The area is located south of the Orinoco River in the State of Bolivar. The Government noted that the intent of the decree was especially aimed at the development of reserves of bauxite, coltan, diamond, gold, and iron ore (Agencia Venezolana de Noticias, 2016b).

In December, the Asamblea Nacional Constituyente [National Constituent Assembly] (ANC) announced the passage of Ley del Régimen Tributario para el Desarrollo Soberano del Arco Minero [Tax Regime for the Development of the Orinoco Mining Region], which is a legal instrument to help promote the mining sector by implementing an economic and financial model to regulate mining ventures and their strategic alliances. The legal instrument's main goal is to diversify the economy of the region by allowing mining activities, while ensuring that all alliances formed in the Orinoco Mining Arc are in compliance with environmental protection regulations; the instrument also includes measures to protect indigenous communities. Article 5 of this initiative allocates part of the taxes collected from established alliances to the development of new technologies, research, mine safety, and environmental protection and remediation to support better mining practices. As of the end of December, 24 strategic alliances had been signed between 2,000 small-scale miners and the Corporación Venezolana de Minería [Venezuelan Mining Corporation] (Agencia Venezolana de Noticias, 2017b).

In December 2017, the ANC issued Ley Constitucional de Inversión Extranjera Productiva [Constitutional Law on Foreign Direct Investment], which repealed Decree No. 1,438 (Law of Foreign Investments published in the Special Official Gazette No. 6,152 of November 18, 2014) and modified the legal framework applicable to foreign investments in Venezuela. The law is focused on, among other issues, maintaining equality in treatment between national and foreign investments in all sectors, and it requires companies to register with the Government any contracts involving the development of technology. The law allows for three types of foreign investments: foreign direct investment (through the contribution of tangible or financial resources); portfolio foreign investment (through the acquisition of stock or interest in any type of entity with a participation equal or higher than 10% of the stock); and preferential foreign investment (relevant for sectors defined as preferential by the Government). The law provides special benefits and favorable conditions, such as tax exemptions, accelerated amortizations, tariff exemptions, and preferential access to raw materials administered by the state. These benefits are granted to foreign investments that are under an agreement with Venezuela (Baker McKenzie, 2018).

The Ministerio de Poder Popular de Petróleo y Minería [Ministry of Petroleum and Mining], which was established by Decree No. 9,309 in 2012, had been the Government entity responsible for all legal matters related to mining and petroleum extraction activities. In 2016, the Ministry was split into two with the creation of the Ministerio del Poder Popular de Desarrollo Minero Ecológico [Ministry of Ecological Mining Development] (MPPDME) and the Ministerio de Poder Popular de Petróleo [Ministry of Petroleum] (MinPetróleo); the split was established by Decree No. 2,413. The Ministerio del Poder Popular para Industrias y Producción Nacional

[Ministry of Industries and Production], established by Decree No. 8,609 in 2011, was the Government entity responsible for all legal matters related to industries. In December 2015, Decree No. 6,210 was passed; the law requires a 55% share by the Government in all mining projects, sets a period of no more than 20 years for mining operations, and entitles the Government to a minimum share of 3% and a maximum share of 13% as a royalty on the value of gold production and "other strategic minerals" (not specified). According to the Venezuelan Constitution, all mineral and hydrocarbon resources belong to the state (Agencia Venezolana de Noticias, 2016a; Ministerio del Poder Popular de Petróleo y Minería, 2016, p. 48–53; Ministerio del Poder Popular para Industrias, 2016, p. 58–61, 67–68; Thomson Reuters, 2016).

The Instituto Nacional de Geología y Minería [National Institute of Geology and Mining] (INGEOMIN), established by Decree No. 5,382 of 1999, is the Government entity responsible for research and other matters related to geology, minerals, geophysics, geochemistry, geotechnics, and other resource areas. The INGEOMIN advises both government agencies and the private sector regarding the optimal utilization of mineral resources and water; prevention and mitigation of the effects of natural hazards; and sustainable development (Ministerio del Poder Popular de Petróleo y Minería, 2016, p. 5, 572).

Production

As was the case since 2015, production of most mineral commodities decreased owing to the financial strain caused by the country's weak economy and political instability. Production of some mineral commodities was reported to be zero in 2017, including, ferromanganese, ferronickel, ferrosilicon, and nickel. Production of many commodities decreased to a 5-year low; these included production of iron ore, which decreased by 67%; coal, 57%; silicomanganese, 56%; bauxite, 39%; petroleum refinery products, 21%; alumina, raw steel, and phosphate rock (gross weight), 20% each; gold, 14%; crude petroleum, 12%; and phosphate rock (P₂O₅ content), 11%. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Government-owned Petróleos de Venezuela S.A. (PDVSA) had majority control of Venezuela's petroleum sector. The Government-owned Corporación Socialista del Cemento S.A. controlled the cement sector through its subsidiaries C.A. Fabrica Nacional de Cementos S.A.C.A. (FNC), Corporación de Cemento Andino C.A. (Cemento Andino), Empresa de Cemento Cerro Azul C.A. (Cemento Cerro Azul), Industria Venezolana de Cementos S.A. (INVECEM), and Venezolana de Cementos S.A.C.A. (VENCEMOS).

Government-owned Corporación Venezolana de Guayana (CVG) is a conglomerate of 21 companies and is located in the city of Guayana, Bolivar State. The conglomerate is part of the Empresas Básicas de Guayana, which produces raw material for other companies to produce finished products. The companies that make up CVG are focused in three sectors: aluminum, iron and steel, and mineral-related services. Companies under the aluminum sector were C.V.G. Aluminio del Caroní S.A. (CVG Alcasa),

CVG Aluminio de Carabobo S.A. (CVG Alucasa), CVG Aluminios Nacionales, S.A. (CVG Alunasa), CVG Bauxilum C.A. (CVG Bauxilum), CVG Carbones del Orinoco, C.A. (CVG Carbonorca), CVG Rines de Aluminio, C.A. (CVG Rialca), CVG Venezolana de Aluminio C.A. (CVG Venalum), and Empresa Conductores de Aluminio del Caroní, C.A. (CVG Cabelum). CVG companies under the iron and steel sector were Briquetera del Caroní C.A. (Briqcar), Briquetera del Orinoco C.A. (Orinoco Iron), Briquetera de Venezuela C.A. (Briqven), Complejo Siderúrgico de Guayana (Comsigua, C.A.), CVG Ferrominera Orinoco C.A. (CVG FMO), CVG Refractario Socialista de Venezuela, C.A. (CVG Refractarios C.A.), and Siderúrgica del Orinoco Alfredo Maneiro (CVG Sidor C.A.). CVG companies under the mineral services sector were CVG Promociones Ferroca, S.A. (CVG Ferrocasa), Corporación Venezolana de Guayana (CVG Internacional), CVG Compañía Nacional de Cal, C.A. (CVG Conacal), CVG Fundeporte, CVG Técnica Minera, C.A. (Tecmin), and Sociedad de Garantías Recíprocas (SGR) (Heredia Terán, 2019).

The Corporación Venezolana de Minería S.A. (CVM) operated the Mina Norte and Paso Diablo Mines located in the State of Zulia; the two mines had a combined production capacity of about 8.3 million metric tons per year (Mt/yr) of coal. CVM Loma Niquel had the capacity to produce about 14,400 metric tons per year (t/yr) of nickel and 72,000 t/yr of ferronickel. Table 2 is a list of major mineral industry facilities (table 2).

Some transnational companies continued to operate in the petroleum sector, always in partnership with state-owned PDVSA. These companies included Chevron Corp. (headquartered in the United States), Repsol S.A. (Spain), OAO Gazprom (Russia), China National Petroleum Corp. (CNPC) (China), Royal Dutch Shell plc (United Kingdom and Netherlands), Eni S.p.A. (Italy), Statoil ASA (Norway), Total S.A. (France), and Oil and Natural Gas Corp. (ONGC) (India).

Mineral Trade

The total value of exported goods from Venezuela to the United States in 2017 was about \$12.3 billion; this was an increase of 13% compared with the \$10.9 billion value of exported goods in 2016. Mineral exports to the United States from Venezuela were dominated by crude petroleum, which was valued at \$10.4 billion compared with \$9.3 billion in 2016. Other noteworthy mineral-related exports were other petroleum products, \$880 million; bauxite and alumina, \$195 million; nonmonetary gold, \$14 million; and other nonferrous metals, \$11 million. Venezuela imported a total of \$4 billion worth of goods from the United States, mostly petroleum products valued at \$1.6 billion and crude petroleum valued at \$415 million. Venezuela was a member of the Asociación Latinoamericana de Integración [Latin American Integration Association] (ALADI), the Comunidad de Estados Latinoamericanos y Caribeños [Community of Latin American and Caribbean States] (CELAC), the Mercado Común del Sur [Southern Common Market] (MERCOSUR); the Organization of the Petroleum Exporting Countries (OPEC), and the World Trade Organization (WTO), and it was the controlling member of PetroCaribe (European Commission, 2017, p. 8; U.S. Census Bureau, 2018a, b).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—CVG Bauxilum operated the Los Pijiguaos bauxite mine located in central Venezuela in Bolivar State; the mine accounted for all Venezuela's bauxite production in 2017. Production at the mine decreased by 39% to an estimated 550,000 metric tons (t) in 2017 from a revised 909,000 t in 2016; production was down by more than 76% since 2014. Several factors, including the limited availability of equipment, weak management, and reduced demand, were credited for the decline. CVG Bauxilum also operated Venezuela's only alumina refinery, which was located in southeastern Venezuela in Bolivar State. Similar to bauxite, alumina production also decreased in 2017, by 20% to an estimated 240,000 t from a revised 301,000 t in 2016, owing largely to an insufficient supply of bauxite (table 1; Ministerio del Poder Popular de Petróleo y Minería, 2016, p. 845; Ministerio del Poder Popular para Industrias, 2016, p. 268, 271; Agencia Venezolana de Noticias, 2017a).

Gold.—Since 2010, the annual production of gold in Venezuela had decreased by more than 90% to an estimated 480 kilograms (kg) in 2017 from about 7,000 kg of gold in 2010. State-owned CVG operated most of the gold mines, which were located in the State of Bolivar in southern Venezuela. During 2017, several mining companies, including Canadian companies Crystallex International Corp., Gold Reserve Inc., and Rusoro Mining Ltd., continued with their legal suits against the Government over the Government's seizure of gold mines and projects during the past decade. Some of the more notable gold mines and projects involved in these suits included El Choco, Isidora, Las Brisas, and Las Cristinas. These mines and projects had significant gold reserves; for example, Las Cristinas was estimated to have proven reserves of gold in excess of 500,000 kg (Gurmendi, 2012, p. 4; Els, 2016; Toro, 2016).

In November 2017, Crystallex and the Government agreed on a settlement for \$1.2 billion. The dispute between the parties dated back to the nationalization of the country's gold deposits in 2011. Crystallex declared bankruptcy in 2011 after its gold project, Las Cristinas deposit, was seized (Dmitrieva and others, 2017).

Iron and Steel.—In 2017, raw steel production in the country decreased by 20% to 444,000 t from a revised 553,000 t in 2016. State-owned steel company CVG Sidor C.A. was the leading steelmaking company in Venezuela. In June 2017, CVG Sidor C.A. halted operations at its plant at Decapado I & II because of a fire there. During the past few years, steel production from this plant had decreased considerably owing to multiple factors, including weak management, financial constraints, power outages, and a lack of machinery, equipment, supplies, and raw materials. The company's integrated steel complex, which was located at the industrial area of Matanzas in Bolivar State, had the capacity to produce about 4 Mt/yr of steel (tables 1, 2; Diaz, 2017).

In November 2017, the Government of Venezuela announced the establishment of the \$800 million China and Venezuela Binational Cooperation Fund to finance various development projects associated with Empresas Básicas de Guayana.

The projects included the construction of the second Ferrominera Orinoco pellet plant (a producer of hot-briquetted iron) at a cost of \$425 million; the extension of the Palua dock (port) at a cost of \$112 million; and funds assigned to support the National Steel Complex, specifically the wire rod line located at the Antimano plant (Descifrado.com, 2017).

Industrial Minerals

Cement.—Cement production in 2017 increased by 10% to about 8 million metric tons (Mt) from a revised 7.3 Mt in 2016. Venezuela made progress on a number of projects to add additional cement capacity in 2017, including on Corporación Socialista del Cementos' second production line at the Llanadas de Monay plant in Trujillo. After the upgrade, the cement production capacity at the state-owned plant increased to 1.35 Mt/yr from 0.5 Mt/yr (Global Cement, 2017).

Mineral Fuels

Coal.—Coal production in Venezuela continued to decline in 2017, decreasing to 300,000 t, which was 57% lower than the revised 700,000 t produced in 2016; the decline was owing largely to historically low international coal prices. Venezuela was the third-ranked coal-producing country in the Latin America and the Caribbean region in 2017 after Colombia and Brazil. Total proven coal reserves in Venezuela at the end of 2017 were 731 Mt of anthracite and bituminous coal; Brazil and Colombia had proven coal reserves estimated to be 6.6 billion metric tons (Gt) and 4.9 Gt, respectively (table 1; BP p.l.c., 2018, p. 36, 38).

Natural Gas and Petroleum.—Petroleum production decreased by about 12% in 2017 compared with that of 2016, and production of natural gas (marketed) decreased by 1.5%. The natural gas and petroleum industries in Venezuela, which were largely run by PDVSA, had suffered from a lack of investment and profitability since 2006 when the Government increased its share of ownership in oilfields that were managed by foreign companies. At yearend 2016 (the latest year for which data were available), PDVSA's total debt, including that of its subsidiaries, was \$41.1 billion; this was a decrease of 6.0% compared with the \$43.7 billion owed at yearend 2015. PDVSA partnered with several major international oil and gas companies in Venezuela in 2017, including BP, Chevron, CNPC, Eni, Total, and Vietnam Oil and Gas Group (table 1; *Petróleos de Venezuela S.A.*, 2017, p. 4).

In June 2017, China and Venezuela signed an agreement for an investment plan valued at about \$2.8 billion to increase the production of crude petroleum to 325,000 barrels per day (bbl/d). The increase in petroleum production was targeted for the Hugo Chávez Orinoco Oil Belt. The agreement was part of the development of the Petrosinovensa and Petrozumano joint ventures and the comprehensive maintenance of 300 wells in the Ayacucho Block. The Petrosinovensa joint venture was between PDVSA and CNPC, and the Petrozumano joint venture was between the Corporación Venezolana de Petróleo S.A. and CNPC Venezuela. With this investment, Petrosinovensa would go from production of 165,000 bbl/d to production of 230,000 bbl/d, and the Petrozumano joint venture would add

an additional 15,000 bbl/d to its production. The increase in production will be complemented by the reconnection of wells in Lake Maracaibo. As part of the work agenda, both parties ratified their commitment to continue the construction of the Nanhai refinery (located in Guangdong Province, China), a complex that would have the capacity to process 400,000 barrels of extra-heavy crude petroleum from the Belt. In addition to an investment of \$1,450 million, both countries agreed to boost the infrastructure and equipment development of the Araya Deepwater Port project in Sucre State, which would be used as a strategic point to transport crude petroleum from the Orinoco Belt to the international market, mainly to Asia (*Agencia Venezolana de Noticias*, 2017c).

Venezuela's proven reserves of oil remained relatively flat in 2017, at 302.8 billion barrels (Gbbbl) compared with 302.3 Gbbbl in 2016. Venezuela accounted for 90% of the proven oil reserves of the Latin America region, nearly 25% of the total proven petroleum reserves of OPEC, and 20% of global reserves. In 2017, petroleum exploration in Venezuela consisted of 189 active rigs compared with 138 in 2016 (the highest in recent years was 221 rigs in 2014). Venezuela had the most active rigs in the Latin America and Caribbean region in 2017, accounting for 55% of the region's total, 25% of the total for OPEC (754 rigs), and 5% of the world total (3,807 rigs). According to BP's "Statistical Review of World Energy," Venezuela was the 12th-ranked producer of crude petroleum after the United States, Saudi Arabia, Russia, Iran, Canada, Iraq, the United Arab Emirates, China, Kuwait, Brazil, and Mexico (*Organization of the Petroleum Exporting Countries*, 2018, p. 26, 27, 32; BP p.l.c., 2019, p. 16).

Venezuela's proven natural gas reserves in 2017 totaled 5.7 trillion cubic meters, a decrease of 0.6% compared with that of 2016; these reserves accounted for 72% of the total for the Latin America and the Caribbean region and 6% of the total for OPEC (95,951 trillion cubic meters). Approximately 90% of the natural gas reserves are associated with the petroleum reserves that are located in the Orinoco Belt (*Organization of the Petroleum Exporting Countries*, 2018, p. 112).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

In 2018, Venezuela accounted for 1.6% of global crude petroleum production and was the second-ranked producing country in the Latin America and the Caribbean region. Proven petroleum reserves in Venezuela represented 17.5% of the global total, which was the largest share in the world. The most significant commodities produced in Venezuela in 2018, were aluminum (primary), cement, gold, iron, lime, natural gas, and petroleum (table 1; BP p.l.c., 2019, p. 14, 16).

Minerals in the National Economy

Venezuela's gross external debt was estimated to be \$151.2 billion in 2018 compared with \$150 billion in 2017. Venezuela's economic activity declined for the fifth consecutive year. Between 2013 and 2018, the GDP based on purchasing power parity decreased by a cumulative 40%. The IMF reported that Venezuela's GDP was estimated to be about \$331 billion in 2018 compared with \$381 billion in 2017, which was a decrease

of approximately 13%. In the first three quarters of 2018 (no data were available for the fourth quarter of 2018, and the year-on-year comparison is based on the cumulative values for the first three quarters of 2018), petroleum production fell by 26% compared with the same timeframe in 2017. Mining was the only non-oil related sector that expanded in 2018 (by 12.1%), whereas the value added of the construction sector decreased by 55.3% (table 1; Economic Commission for Latin America and the Caribbean, 2019a, p. 204; 2019b, p. 1; International Monetary Fund, 2019).

In August 2018, the Government announced the Economic Recovery, Growth and Prosperity Program, which consisted of a set of policy measures for the purpose of stabilizing inflation and promoting economic growth. The program included a target for zero fiscal deficit in the future. No further details were released by the Venezuelan tax authority on the implementation and expected effects of the measure (Economic Commission for Latin America and the Caribbean, 2019b, p. 1–2).

In terms of trade, total imports to Venezuela had been shrinking since 2012; that is, between 2013 and 2018, the cumulative reduction of imports was 74%. Petroleum imports increased by 117% in 2018, however, to more than \$9 billion from about \$4.2 billion in 2017. The increase in petroleum imports may be attributable to Venezuela's decrease in petroleum production capacity, despite an increase of 33% in oil prices compared with those of 2017. Nonfuel imports decreased to \$5.8 billion in 2018, or by 26% compared with those of 2017. In 2018, Venezuela's petroleum exports decreased by 5.4%, whereas nonfuel exports increased by 52.7%. The growth of nonfuel exports was owing to an increase in mining products exports, mainly gold (no details were available regarding the amount of minerals exported) (Economic Commission for Latin America and the Caribbean, 2019b, p. 5).

Production

As was the case since 2015, production of most mineral commodities decreased as a result of the financial strain caused by the country's weak economy and political instability. Some commodities were estimated to have had zero production in 2018, such as alumina, bauxite, all ferroalloys, and nickel. Production levels of many commodities decreased to a 5-year low, including production of raw steel, which decreased by 91% compared with that of 2014; iron ore (by 78%), coal (75%), petroleum refinery products (66%), gold (55%), phosphate rock (gross weight) (44%), crude petroleum (43%), direct-reduced iron (41%), aluminum (38%), phosphate rock (mineral content) (37%), lime (36%), unspecified clay (32%), nitrogen (25%), feldspar (15%), and cement (12%) (table 1).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—In August 2018, it was reported that the Government was attempting to restart the bauxite operations at the Los Pijiguaos bauxite mine, but the mine is thought not to have produced any bauxite in 2018. CVG Bauxilum had shut down operations at the mine in 2017 owing

possibly to such factors as shortages of cash and labor and a chronic power supply deficit. CVG Bauxilum also operated Venezuela's only alumina refinery, which was located in Bolivar State. Similar to bauxite, alumina production was estimated to be zero, largely because no bauxite is thought to have been produced. In 2018, the Government was seeking financial and technical assistance from Turkey and Russia to restart the Alcasa, Bauxilum, and Venalum refineries (Argus Media Ltd., 2018).

Gold.—In March 2018, Gold Reserve Inc. (GRI) released a report on the Siembra Minera project, which is located in Bolivar State and encompassed the Las Brisas and Las Cristinas properties. GRI, in conjunction with GR Engineering Barbados Inc. (GRE), prepared the technical report on the project. The operating company Empresa Mixta Ecosocialista Siembra Minera, S.A. [which was also known as Siembra Minera and was owned by the Government through Corporación Venezolana de Minería (55%) and GR Mining Barbados, Inc. (GRM), a wholly-owned subsidiary of GRI (45%)], held the rights to the Siembra Minera project. The project consisted of a gold-copper deposit located in the mining district of Bolivar State. The project was expected to have a 45-year mine life, including a 2-year preproduction period for the leach plant and an additional 2-year period for the construction of a flotation concentrator. The leach plant would have an ore-processing capacity of 5.8 Mt/yr initially and a capacity of up to 12.25 Mt/yr after year 11. The concentrator would have a designed processing capacity of 58 Mt/yr initially and a capacity of up to 36.8 Mt/yr after year 11. The total combined leach and concentrator production was expected to reach 2 Gt at a grade of 0.70 gram per metric ton (g/t) gold, 0.50 g/t silver, and 0.090% copper, for a total recoverable metal estimate of 1.2 kg (38.1 million troy ounces) of gold, 531,900 kg (17.1 million troy ounces) of silver, and 1.5 Mt of copper (U.S. Securities and Exchange Commission, 2018, p. 10, 14–15).

In 2018, Venezuela's Central Bank reported that it began refining gold in Turkey amid sanctions imposed by the United States on the gold industry in Venezuela. The Central Bank reported that it purchased gold from small miners operating in the south of the country; after the refining process in Turkey, the gold was shipped back to Venezuela to be stored as Central Banks reserves (Thomson Reuters, 2018).

Industrial Minerals

Cement.—In March 2018, Venezuela announced an agreement with Megatech International of India for the construction of a 600-metric-ton-per-day-capacity cement plant. The Yaracuy project was located in the Barranco Amarillo sector of the Valeroso Peña Industrial Complex in Peña. The \$25 million project was expected to come online by the end of 2018 (CemNet.com, 2018).

Mineral Fuels

Coal.—Coal production in Venezuela was estimated to have decreased to 200,000 t in 2018, which was 33% less than the 300,000 produced in 2017. Venezuela was the 3d-ranked coal-producing country in the Latin America and the Caribbean

region in 2018 after Colombia and Brazil. Total proven coal reserves in Venezuela at the end of 2018 were 731 Mt of anthracite and bituminous-quality coal (table 1; BP p.l.c., 2019, p. 42, 44).

Natural Gas and Petroleum.—In 2018, petroleum production decreased by about 28% compared with that of 2017, and marketed natural gas decreased by 14% (table 1). According to BP, Venezuela's proven reserves of petroleum stabilized in 2017 at 302.8 Gbbl and remained the same for 2018. Petroleum exploration slowed in 2018 as the number of active rigs in Venezuela decreased to 151 from 189 in 2017. Venezuela had the most active rigs in the Latin America and Caribbean region in 2018, accounting for 45% of the region's total, 19% of the total for OPEC (804 rigs), and about 6% of the world total (2,641 rigs). In 2018, Venezuela was the 17th-ranked producer of crude petroleum after the United States, Saudi Arabia, Russia, Canada, Iran, Iraq, United Arab Emirates, China, Kuwait, Mexico, Brazil, Nigeria, Kazakhstan, Qatar, Norway, and Angola (BP p.l.c., 2019, p. 16; Organization of the Petroleum Exporting Countries, 2019, p. 26, 27, 31).

Venezuela's proven natural gas reserves in 2018 were 5.7 trillion cubic meters, which was a decrease of 0.6% compared with those of 2017; these reserves accounted for 73% of the total for the Latin America and the Caribbean region and about 8% of the total for OPEC (72,676 trillion cubic meters) (Organization of the Petroleum Exporting Countries, 2019, p. 112).

Outlook

For 2019, the Economic Commission for Latin America and the Caribbean projected a further reduction in Venezuela's GDP of more than 20%. The sharp and prolonged fall in petroleum production has been marked by continued contraction in domestic aggregate demand, a lack of reliable electricity and fuel supply, and severe economic policy constraints as a result of hyperinflation and limited access to international financial markets. The growth in imports recorded in 2018 and the expansion of the mining sector may be hindered in the near future by the imposition of international financial and trade sanctions on Venezuela (Economic Commission for Latin America and the Caribbean, 2019b, p. 1).

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TABLE 1
VENEZUELA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²		2014	2015	2016	2017	2018
METALS						
Aluminum:						
Bauxite	thousand metric tons	2,346	992	909 ^r	550 ^e	--
Alumina	do.	660	465	301 ^r	240 ^e	--
Metal, primary	do.	138	119	147 ^r	144	86
Ferroalloys:						
Ferromanganese		8,000	-- ^r	-- ^r	--	--
Silicomanganese		39,000	35,000	42,000 ^r	18,670	--
Ferronickel		20,800 ^{r,e}	16,700 ^{r,e}	-- ^{r,e}	--	--
Ferrosilicon ^e		74,300	74,300 ^r	37,000 ^r	--	--
Gold, mine, Au content	kilograms	1,056	558	558 ^r	480 ^e	480 ^e
Iron ore:						
Gross weight	thousand metric tons	11,256	11,716	12,000 ^r	4,005	2,474
Fe content	do.	7,035	7,323	7,500 ^r	2,500	1,550
Iron and steel:						
Direct-reduced iron	do.	1,680 ^r	2,750 ^r	1,590 ^r	1,680	990
Steel, raw ³	do.	1,485	1,345	553 ^r	444	129
Lead, refinery, secondary ^e	do.	20	20	16	16	9
Nickel:						
Mine, laterite ore		5,000	4,800 ^r	-- ^{r,e}	--	--
Ni content		5,000	4,000	-- ^r	--	--
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	7,940 ^r	8,210	7,300 ^{r,e}	8,030 ^e	7,000 ^e
Clay:						
Kaolin		2,500	2,400 ^e	2,400 ^{r,e}	2,400 ^e	2,400 ^e
Unspecified	thousand metric tons	28	20	19 ^e	19 ^e	19 ^e
Feldspar, mine		93,900	75,500	80,000 ^e	75,000 ^e	80,000 ^e
Lime ^e		360,000	350,000	290,000 ^r	290,000	230,000
Nitrogen, ammonia, N content	thousand metric tons	1,100 ^e	1,000 ^e	830 ^r	820	820 ^e
Phosphate rock:						
Gross weight		35,820	26,324	25,000 ^e	20,000 ^e	20,000 ^e
P ₂ O ₅ content ^e		9,500	7,000 ^r	6,750	6,000	6,000
Stone, sand, and gravel, construction:						
Sand and gravel, sand	thousand metric tons	729	700	700 ^e	700	700 ^e
Stone, crushed, other, unspecified		6,900	6,800 ^e	6,700 ^e	6,700 ^e	6,700 ^e
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous	thousand metric tons	801	802	700 ^r	300	200 ^e
Natural gas:						
Gross	million cubic meters	76,717	80,119	84,600 ^e	83,500	72,000
Marketable	do.	21,878	25,943	27,400 ^e	27,000	23,200 ^e
Petroleum:						
Crude	thousand 42-gallon barrels	1,014,000	1,001,000	910,000 ^e	804,000 ^e	580,500 ^e
Natural gas liquids	do.	41,610	42,669	45,000 ^e	44,400 ^e	38,200 ^e
Refinery	do.	420,188	394,000 ^e	318,000 ^e	250,000 ^e	140,800 ^e

^eEstimated. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through December 6, 2019. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

²In addition to the commodities listed, carbon black, common clay, diamond, limestone, salt, sulfur, and quartz may have been produced, but available information was inadequate to make reliable estimates of output.

³Source: World Steel Association

TABLE 2
VENEZUELA: 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
Alumina	C.V.G. Bauxilum C.A. [Corporación Venezolana de Guayana (CVG)]		Refinery, Puerto Ordaz, Bolivar State	2,000
Aluminum	C.V.G. Aluminio del Caroní, S.A. (Alcasa) [Corporación Venezolana de Guayana (CVG)]		do.	200
Do.	C.V.G. Venezolana de Aluminio C.A. (Venalum) [Corporación Venezolana de Guayana (CVG), 80%, and Showa Denko K.K., Kobe Steel Ltd., Sumitomo Chemical Co. Ltd., Mitsubishi Materials Corp., Mitsubishi Aluminum Co., and Marubeni Corp., 20%]		do.	430
Bauxite	C.V.G. Bauxilum C.A. [Corporación Venezolana de Guayana (CVG)]		Los Pijiguaos Mine, Cedeño, Bolivar State	6,000
Cement	C.A. Fabrica Nacional de Cementos S.A.C.A. (Corporación Socialista del Cemento, S.A.)		Ocumare plant, Ocumare del Tuy, Miranda State	1,210
Do.	do.		Tachira plant, Palmira, Tachira State	220
Do.	Corporación de Cemento Andino C.A. (Corporación Socialista del Cemento, S.A.)		Llanadas de Monay plant, Trujillo State	1,350
Do.	Corporación de Cemento Catatumbo C.A. (Corporación Socialista del Cemento, S.A.)		Villa Del Rosario plant, Zulia State	650
Do.	Empresa Cemento Cerro Azul C.A. (Corporación Socialista del Cemento, S.A.)		Cerro Azul plant, Monagas State	1,000
Do.	Industria Venezolana de Cementos S.A. (Corporación Socialista del Cemento, S.A.)		Cumarebo plant, Falcon State	1,590
Do.	do.		San Sebastian plant, San Sebastian de los Reyes, Aragua, State	2,710
Do.	Venezolana de Cementos S.A.C.A. (Corporación Socialista del Cemento, S.A.)		Guayana plant, Bolivar State	330
Do.	do.		Lara plant, Lara State	490
Do.	do.		Mara plant, Zulia State	730
Do.	do.		Pertigalete plant, Anzoategui	2,680
Coal	Carbones de la Guajira S.A. (Government of Venezuela, 100%)		Mina Norte, Guajira, Zulia State	1,500
Do.	Carbones del Guasare S.A. (Government of Venezuela, 51.63%)		Guasare, Guajira, Zulia State	6,800
Ferronickel	Corporacion Venezolana de Minería S.A. [Petróleos de Venezuela S.A. (PDVSA) (Government, 100%)]		Loma de Niquel, Aragua and Miranda States	72
Ferrosilicon	FerroAtlantica de Venezuela, S.A. [Ferrolobe PLC, 80%, and Corporación Venezolana de Guayana (CVG), 20%]		Puerto Ordaz, Bolivar State	96
Gold	kilograms	C.V.G. Compañía General de Minería C.A. [Corporación Venezolana de Guayana (CVG)]	Capitan Eduardo Vera Plant, Bolivar State	NA
Do.	do.	do.	Caratal plant, Bolivar State	NA
Do.	do.	do.	Colombia Mine, Bolivar State	2,000 °
Do.	do.	do.	El Peru plant, Bolivar State	NA
Do.	do.	do.	Hansa San Luis Mine, Bolivar State	NA
Do.	do.	do.	Isidora Mine, Bolivar State	2,500 °
Do.	do.	do.	San Rafael-El Placer Mine, Bolivar State	200 °
Do.	do.	do.	Sosa Mendez Mine, Bolivar State	1,700 °
Do.	do.	do.	Tomi Mine, El Callao, Bolivar State	2,000 °
Do.	do.	do.	Union Mine, Bolivar State	NA
Do.	do.	Promotora Minera de Venezuela (C.V.G. Compañía General de Minería C.A.)	El Choco mines and plant, El Callao, Bolivar State	NA
Iron and steel	Braquetera del Orinoco		Hot-briquetted iron in Puerto Ordaz, Bolivar State	2,200
Do.	Complejo Siderúrgico de Guayana C.A. [Corporación Venezolana de Guayana (CVG)]		do.	1,000
Do.	C.V.G. Ferrominera Orinoco C.A. [Corporación Venezolana de Guayana (CVG)]		Altamira, Cerro Bolivar, Las Pallas, Los Barrancos, and San Isidro Mines, Bolivar State	25,000
Do.	do.		Hot-briquetted iron in Puerto Ordaz, Bolivar State	1,000
Do.	do.		Iron ore pellets in Puerto Ordaz, Bolivar State	1,100

See footnotes at end of table.

TABLE 2—Continued
 VENEZUELA: 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
Iron and steel—Continued		Siderúrgica del Orinoco "Alfredo Maneiro" S.A. (SIDOR) [Corporación Venezolana de Guayana (CVG), 80%]- CVG Sidor C.A.	Iron ore pellets in Puerto Ordaz, Bolívar State	4,250
Do.		do.	Steel plant in Puerto Ordaz, Bolívar State	4,300
Do.		Venezolana de Prereducidos de Caroní (International Briquettes Holding, 100%)	Hot-briquetted iron in Puerto Ordaz, Bolívar State	815
Lead, refined	metric tons	Funmetal C.A	Mariara, Carabobo	NA
Natural gas	million cubic meters	Petroboscan S.A. [Petróleos de Venezuela S.A. (PDVSA), 60.8%, and Chevron Corp., 39.2%]	Boscan Field in Zulia State	70 °
Do.	do.	Petroindependiente S.A. [Petróleos de Venezuela S.A. (PDVSA), 74.8%, and Chevron Corp., 25.2%]	LL-652 Field in Lake Maracaibo	700 °
Do.	do.	Petropiar S.A. [Petróleos de Venezuela S.A. (PDVSA), 70%, and Chevron Corp., 30%]	Hamaca Field in Orinoco Belt	146 °
Nickel, Ni content		Corporación Venezolana de Minería S.A. [Petróleos de Venezuela S.A. (PDVSA) (Government, 100%)]	Loma de Niquel, Aragua and Miranda States	14
Nitrogen content of ammonia		Petroquímica de Venezuela S.A. (Government, 100%)	Jose Antonio Anzoategui Petrochemical complex, Anzoategui State	1,200
Do.		do.	Ana Maria Campos Petrochemical complex, Zulia State	300
Do.		do.	Moron Petrochemical complex, Carabobo State	200
Petroleum:				
Crude	thousand 42-gallon barrels	Petroanzoategui S.A. [Petróleos de Venezuela S.A. (PDVSA), 100%]	Junin area in Orinoco Belt	NA
Do.	do.	Petroboscan S.A. [Petróleos de Venezuela S.A. (PDVSA), 60.8%, and Chevron Corp., 39.2%]	Boscan Field in Zulia State	10,000 °
Do.	do.	Petrocarabobo, S.A. [Petróleos de Venezuela S.A. (PDVSA), 60%; Repsol S.A. and PC Venezuela Ltd, 11%; Petrocarabobo Ganga B.V., 11%; Indoil Netherlands B.V., 7%]	Carabobo area in Orinoco Belt	11,000 °
Do.	do.	Petrocedeno S.A. [Petróleos de Venezuela S.A. (PDVSA), 60%; Total S.A., 30.3%; Statoil ASA, 9.7%]	Zuata Region, Junin area in Orinoco Belt	73,000 °
Do.	do.	Petroindependiente S.A. [Petróleos de Venezuela S.A. (PDVSA), 74.8%, and Chevron Corp., 25.2%]	LL-652 field in Lake Maracaibo	370 °
Do.	do.	Petrojunin S.A. [Petróleos de Venezuela S.A. (PDVSA), 60%, and Eni S.p.A., 40%]	Block 5, Junin area in Orinoco Belt	NA
Do.	do.	Petrolerasinovensa, S.A. [Petróleos de Venezuela S.A., 64.25%, and China National Petroleum Corp. (CNPC), 35.75%]	Sinovensa, Carabobo in Orinoco Belt	NA
Do.	do.	Petromacareo S.A. [Petróleos de Venezuela S.A., 60%, and PetroVietnam (Vietnam Oil and Gas Group), 40%]	Block 2 North, Junin area in Orinoco Belt	NA
Do.	do.	Petromiranda, S.A. [Petróleos de Venezuela S.A. (PDVSA), 60%, and Consorcio Nacional Petroleo SRL, 40%]	Block 6, Junin area in Orinoco Belt	NA
Do.	do.	Petromonagas S.A. [Petróleos de Venezuela S.A. (PDVSA), 83.33%, and BP p.l.c., 16.67%]	Carabobo area in Orinoco Belt	NA
Do.	do.	Petropiar S.A. [Petróleos de Venezuela S.A. (PDVSA), 70%, and Chevron Corp., 30%]	Hamaca Field in Orinoco Belt	3,300 °
Do.	do.	Petrouirica S.A. [Petróleos de Venezuela S.A., 60%, and China National Petroleum Corp. (CNPC), 40%]	Block 4, Junin area in Orinoco Belt	NA
Refinery products	do.	Petróleos de Venezuela S.A. (Government, 100%)	Bajo Grande, Zulia State	5,800 °
Do.	do.	do.	El Palito, Carabobo State	51,100 °
Do.	do.	do.	Paraguana, Falcon State	350,000 °
Do.	do.	do.	Puerto de la Cruz, Anzoategui State	68,300 °
Do.	do.	do.	San Roque, Anzoategui State	1,800 °
Phosphate rock		Petroquímica de Venezuela S.A. (Government, 100%)	Riecito Mine, Cerro Riecito, Falcon State	400

°Estimated. Do., do. Ditto. NA Not available.