

2017–2018 Minerals Yearbook

CONGO (KINSHASA)

THE MINERAL INDUSTRY OF CONGO (KINSHASA)

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

The Democratic Republic of the Congo [Congo (Kinshasa)] played a globally significant role in the world's production of cobalt, copper, diamond, gold, tantalum, and tin. In 2017, the country's share of the world's mined cobalt production was more than 60%; tantalum, 42%; diamond, 12%; copper, 5%; tin, 3%; and gold, 1%. Congo (Kinshasa) accounted for about 49% of the world's cobalt reserves. Crude petroleum production also played a significant role in the domestic economy. The country was not a globally significant consumer of minerals or mineral fuels in 2017 (République Démocratique du Congo Ministère des Mines, 2018, p. 36; Shedd, 2018, 2019; Anderson, 2019; Flanagan, 2019; George, 2019; Olson, 2019a, b; Padilla, 2019).

Minerals in the National Economy

The manufacturing sector accounted for an estimated 19.7% of the gross domestic product (GDP) in 2017, and the mining and mineral processing sector, 17.4%. The value of output in the mining sector increased by 7.8% in 2017 compared with a decrease of 0.7% in 2016 (Banque Centrale du Congo, 2018, p. 28, 33).

In 2015 (the latest year for which data were available), large-scale mines employed at least 75,572 Congolese nationals. Copper and cobalt mining accounted for the majority of reported formal mining employment. The top five copper producers in Congo (Kinshasa) employed 31,850 Congolese nationals in 2015. The large-scale gold mines employed 6,502 Congolese nationals, and the large-scale diamond mines, 3,259 Congolese nationals (Moore Stephens LLP, 2017, p. 141–143).

About 450,000 artisanal miners were estimated to be employed in diamond mining in Congo (Kinshasa) in 2016. An additional 100,000 artisanal miners were estimated to be employed in cobalt mining. Between 2013 and 2015, a survey of 1,615 mine sites was conducted in the former Katanga Province (which was divided into Haut-Katanga, Haut-Lomami, Lualaba, and Tanganyika Provinces in 2015), Maniema, Nord-Kivu, and Sud-Kivu Provinces, and Ituri Province (formerly the Ituri Interim Administration of Orientale Province) by the International Peace Information Service (IPIS). Gold mining was reported to employ about 193,000 miners; tin mining, about 32,000; niobium and tantalum mining, about 15,500; diamond, about 4,100; tourmaline, about 3,900; and tungsten, about 1,800. Niobium, tantalum, tin, and tungsten mining employed a total of about 42,800 miners; some mines produced at least two types of minerals (Frankel, 2016; James, 2016; Weyns and others, 2016, p. 15–16).

Government Policies and Programs

The mining sector was governed by law No. 007/2012 of July 11, 2002, which replaced law No. 81–013 of April 2, 1981.

The revised mining code encourages private sector development of the mineral industry; the principal role of the Government is to encourage and regulate the development of the industry. Mining rights are vested with the Government. The petroleum sector was governed by law No. 15–012 dated August 1, 2015.

In December 2017, the National Assembly approved a new mining code that increased royalties on cobalt, copper, and gold to 3.5% and introduced a windfall profits tax. The new mining code also increased the Government's free-carried and non-dilutable share in mining projects to 10% from 5% and reduced the guaranteed period for contract stability (the period during which the Government was not allowed to renegotiate contracts) to 5 years from 10 years. The Senate was expected to address the new mining code in a session that was scheduled to start in early January 2018 (Clowes, 2017).

In April 2013, the Government issued a decree that banned the export of cobalt and copper concentrates to promote domestic downstream processing of cobalt and copper. Companies were given a moratorium to comply with the ban; the moratorium was scheduled to expire at the end of 2015. In December 2015, the Government extended the moratorium until the end of 2016 because power shortages limited downstream processing of concentrates. As of early 2017, it was unclear when the ban would be implemented (Roskill Information Services Ltd., 2017).

Congo (Kinshasa) is a signatory to the Kimberley Process, which is a certification system that was put in place to reduce the trade in conflict diamond; it became effective on January 1, 2003. In 2017, the Diamond Development Initiative (DDI) trained artisanal miners in compliance with the Kimberley Process. DDI was in a program to formalize artisanal diamond mining through the formation of cooperatives (Diamond Development Initiative, 2017).

In July 2010, the U.S. Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) which contains provisions concerning the use of minerals to finance military operations in eastern Congo (Kinshasa). The U.S. Securities and Exchange Commission (SEC) issued regulations in final form in accordance with the Dodd-Frank Act in August 2012. In 2017, the SEC suspended enforcement of the provisions of the Dodd-Frank Act requiring audits and due diligence for conflict minerals in companies' supply chains (Woody, 2019).

In March 2011, the Government of Katanga Province and the International Tin Research Institute (ITRI) started the ITRI Tin Supply Chain Initiative (iTSCI), which is a traceability mechanism for domestically produced tantalum, tin, and tungsten to meet end users' requirements under the Dodd-Frank Act and Organisation for Economic Co-operation and Development due diligence guidelines. In December 2017, 286 mine sites were covered by iTSCI in

the former Katanga Province (which was divided into Haut-Katanga Province, Haut-Lomami Province, Lualaba Province, and Tanganyika Province in 2015), 96 of which were active (International Tin Research Institute, 2018).

In Maniema Province, 326 mine sites were covered by iTSCI in December 2017, of which 208 were active. In Sud-Kivu Province, 115 mine sites were covered, of which 92 were active. In Nord-Kivu Province, 142 mine sites were covered, of which 101 were active (International Tin Research Institute, 2018).

Between 2013 and 2017, armed groups were reported to be present at 938 of the 2,150 mine sites surveyed by IPIS. Gold mines accounted for 813 of the mines with armed groups; tin mines, 89; diamond mines, 16; niobium and tantalum mines, 15; and tungsten mines, 5. Gold mines accounted for 604 of the mines without armed groups; tin mines, 418; niobium and tantalum mines, 139; tungsten mines, 30; and diamond mines, 12. Armed groups present at mines included Congo (Kinshasa) military units and various local groups (Matthysen and others, 2018).

Production

In 2017, the production of cement increased by 255% compared with 2016; refined cobalt, by 140%; tungsten, by an estimated 64%; smelted copper, by an estimated 62%; tin, by an estimated 55%; diamond, by 23%; and mined cobalt, by 18%. Between 2013 and 2017, tin output increased by an estimated 197%; niobium, by an estimated 191%; tantalum by an estimated 184%; tungsten, by an estimated 118%; cement, by 101%; and gold, by an estimated 86%. Germanium production decreased by an estimated 27% in 2017 compared with that of 2016. Lead and silver production shut down in 2016. Between 2013 and 2017, refined cobalt production decreased by 96%; germanium, by an estimated 39%; and smelted copper, by an estimated 38%.

Cement and black copper production increased in 2017 because of the opening of new plants; the increases in cobalt and tin production may be attributable to higher prices on world markets. Data on mineral production are in table 1.

Structure of the Mineral Industry

La Générale des Carrières et des Mines (Gécamines), which was a state-owned company, produced cobalt and copper. Other cobalt and copper mining companies were privately owned; Gécamines held shares of between 5% and 40% in numerous cobalt and copper mining operations. The Government held an 80% share in the large-scale diamond producer Société Minière de Bakwanga (MIBA).

Artisanal and small-scale miners accounted for most Congolese output of diamond, niobium, tantalum, tourmaline, tin, and tungsten. Artisanal and small-scale miners also played a significant role in the country's cobalt and gold mine production (Weyns and others, 2016, p. 4; République Démocratique du Congo Ministère des Mines, 2018, p. 11, 48, 50, 52, 59). Before the Kibali Mine's first full year of production in 2014, artisanal and small-scale miners accounted for most domestic gold production.

In IPIS' surveys between 2013 and 2017, gold was produced in Ituri, the former Katanga, Maniema, Nord-Kivu, and

Sud-Kivu Provinces in at least 1,431 mines; niobium, tantalum, tin, and tungsten, in at least 738 mines; and tourmaline, in at least 14 mines. Some mines produced more than one type of mineral (Matthysen and others, 2018). Capacity, location, ownership, and production information were not readily available for many artisanal and small-scale operations. Table 2 is a list of major mineral industry facilities.

Mineral Trade

Total reported exports were valued at \$11.5 billion in 2017, and imports, \$11.3 billion. Copper accounted for 54% of the value of Congo (Kinshasa)'s exports; cobalt, 29%; gold, 9%; crude petroleum, 3%; and diamond, 2%. Other mineral exports included germanium, niobium, tantalum, tin, tourmaline, tungsten, and zinc. Cobalt and copper were exported to countries that included China and India; gold, to countries that included South Africa; and tantalum, tin, and tungsten, to countries that included Belgium, China, and Malaysia (Banque Centrale du Congo, 2018, p. 90–92; République Démocratique du Congo Ministère des Mines, 2018, p. 54–56, 61).

In 2017, the share of Congolese copper and cobalt production that was refined prior to export was 76% and less than 1%, respectively (table 1). Additional cobalt and copper mine production was exported after processing to intermediate products, such as cobalt carbonate, cobalt hydroxide, and black copper. Low levels of domestic cobalt refining could be attributable to power shortages. Most or all Congolese diamond, niobium, tin, tantalum, and tungsten production was exported prior to downstream processing.

Commodity Review

Metals

Cobalt, Copper, Germanium, and Silver.—In 2017, production at the Tenke Fungurume Mine was 213,843 metric tons (t) of refined copper and 16,419 t of contained cobalt in hydroxide compared with 215,942 t of refined copper and 16,054 t of contained cobalt in 2016. Planned production for 2018 was between 190,000 and 205,000 t of copper and between 16,000 and 17,500 t of cobalt. At the start of 2017, Tenke Fungurume was a joint venture of China Molybdenum Co. Ltd. (56%), Lundin Mining Corp. of Canada (24%), and Gécamines (20%). Lundin sold its share to China Molybdenum in April (Lundin Mining Corp., 2017, p. 24; China Molybdenum Company Ltd., 2018, p. 18, 20).

Mutanda Mining SPRL (Glencore plc of Switzerland, 100%), operated a copper solvent extraction and electrowinning (SX–EW) plant at the Mutanda Mine with a rated capacity of 200,000 metric tons per year (t/yr). The capacity of cobalt in hydroxide was 28,000 t/yr. In 2017, production at Mutanda was 192,100 t of copper, of which 167,400 t was refined. In 2016, production was 213,300 t of copper, of which 196,100 t was refined. Cobalt output in concentrate and hydroxide decreased to about 23,900 t in 2017 from 24,500 t in 2016. In early 2017, Glencore purchased the 31% interest in Mutanda held by Fleurette Properties Ltd. of the Netherlands (Kibawa, 2017, 2018; Glencore plc, 2018, p. 11).

Eurasian Resources Group (ERG) of Luxembourg produced 107,000 t of copper in concentrate at the Frontier Mine in 2016 compared with 79,000 t in 2015. Increased output was attributable to greater operating efficiencies. In 2017, production decreased to 104,000 t (Mining Review Africa, 2017; Eurasian Resources Group, 2018b).

Boss Mining SPRL [ERG, 70%, and Gécamines, 30%] produced copper and cobalt at the Mukondo Mountain Mine and the Luita SX–EW plant. Refined copper production at Luita increased to 37,295 t in 2017 from 26,308 t in 2016. Boss Mining also produced 7,836 t of copper in concentrate in 2015; production increased to an estimated 9,700 t in 2016 before decreasing to about 3,000 t in 2017. Cobalt production was an estimated 5,400 t in 2017 compared with 4,600 t in 2016 and 6,109 t in 2015. The company planned to produce between 2,000 and 3,000 t/yr of cobalt in concentrate in 2018 and 2019 (Kibawa, 2016, 2017, 2018; Moore Stephens LLP, 2017, p. 150; Eurasian Resources Group, 2018a).

Boss Mining planned to produce about 50,000 t/yr of refined copper from oxide ores. Reserves were expected to be depleted in the mid- or late-2020s. The company was considering the extension of mining operations by between 20 and 30 years by mining sulfide ore deposits and re-treating tailings (Eurasian Resources Group, 2018a).

ERG was engaged in the construction of the Roan Tailings Re-treatment (RTR) project at yearend; construction started in June 2015. In the first phase of the project, ERG planned to produce 77,000 t/yr of refined copper and 14,000 t/yr of cobalt in hydroxide by re-treating tailings from previous mining operations near Kolwezi. The company planned to increase production to 105,000 t/yr of copper and 21,000 t/yr of cobalt in the second phase of the project. Production could start in the fourth quarter of 2018 (Cann, 2017; Eurasian Resources Group, 2018c).

MMG Ltd. of China operated the Kinsevere Mine and SX–EW plant. In 2017, production was 80,186 t of refined copper compared with 80,650 t in 2016. Production exceeded the target of between 75,000 and 80,000 t. MMG planned to produce 80,000 t of refined copper at Kinsevere in 2018 (MMG Ltd., 2018).

In November 2015, Sicominex (China Railway Group Ltd. and Sinohydro Corp., 68%; Gécamines and Société Immobilière du Congo, 32%) started production at its cobalt- and copper-mining operations. Refined copper production was 35,951 t in 2017 compared with 44,115 t in 2016; the company also produced copper in concentrate. China Railway Group and Sinohydro pledged to build infrastructure with a value of \$3 billion in return for its stake in Sicominex. Initial planned copper production at the Mashamba West and Dikulwe deposits was 125,000 t/yr (Inside Mining, 2016; Kibawa, 2017, 2018).

Shituru Mining Corp. SPRL (a subsidiary of Pengxin International Mining Co. of China) operated the Shituru Mine. In 2017, the company produced 35,647 t of refined copper at its SX–EW plant compared with 33,583 t in 2016 (Kibawa, 2017, 2018).

Ruashi Mining SPRL (Jinchuan Group International Resources Co. Ltd. of China, 75%) produced cobalt and copper from the Ruashi Mine; refined copper and cobalt hydroxide were produced at the company's SX–EW plant. In 2017,

production was 31,546 t of refined copper and 4,638 t of contained cobalt compared with 32,129 t of refined copper and 3,391 t of contained cobalt in 2016. Increased cobalt production was attributable to higher ore grades and improvements in the recovery process. At yearend, reserves were 8.1 million metric tons (Mt) at grades of 2.1% copper and 0.3% cobalt (Jinchuan Group International Resources Co. Ltd., 2018, p. 12, 19).

In 2017, Jinchuan completed the reopening of the Kinsenda Mine and started pilot production. The company planned to restart large-scale production in early 2018. Planned production was 24,000 t/yr of copper in concentrate during the estimated 10-year life of the mine. Jinchuan planned to study increasing production after reaching full capacity. Reserves at Kinsenda were estimated to be 5.9 Mt at a grade of 4.8% copper (Jinchuan Group International Resources Co. Ltd., 2018, p. 14, 19).

In 2014, Jinchuan completed a feasibility study of a new mine and SX–EW plant at the Musonoi project. The company planned to produce about 40,000 t/yr of copper and 7,000 t/yr of contained cobalt in hydroxide, depending on its approval of the project, which was scheduled in 2017. Mining could start in 2021. As of yearend 2017, the approval of the project was delayed until 2018 as Jinchuan revised the feasibility study and conducted optimization studies. Resources at Musonoi were estimated to be 32.1 Mt at grades of 2.7% copper and 0.9% cobalt (Jinchuan Group International Resources Co. Ltd., 2017, p. 8–9, 25; 2018, p. 15, 17).

At the start of 2016, Chemaf SPRL (a subsidiary of Shalina Resources Ltd. of the United Arab Emirates) produced copper and cobalt at the Etoile Mine and the Usoke Avenue copper SX–EW and cobalt hydroxide plants. The company started refined copper production from its new Etoile plant in October 2016, and cobalt hydroxide, in February 2017. Refined copper production increased to 27,900 t in 2017 from 18,600 t in 2016 and 24,400 t in 2015. Cobalt production in hydroxide increased to 5,160 t in 2017 from 1,600 t in 2016 and 2,200 t in 2015. Chemaf's capacity was 51,500 t/yr of refined copper and 6,200 t/yr of cobalt in hydroxide at the end of 2017 (Chemaf SPRL, 2018, p. 9, 13).

The joint venture of Tiger Resources Ltd. of Australia (60%) and Gécamines (40%) mined copper at the Kipoi project. Production from the mine's SX–EW plant was 17,738 t in 2017 compared with 23,119 t in 2016 (Modern Mining, 2017; Kibawa, 2018).

Gécamines operated the Kamfundwa and the Kilamusembu Mines. The company's total copper production was about 13,000 t in 2017 compared with 11,000 t in 2016. Refined copper production increased to 11,844 t in 2017 from 10,039 t in 2016, and cobalt metal, to 120 t from 50 t. Gécamines had planned to increase its total copper production to 50,000 t in 2017, 75,000 t in 2018, and 125,000 t/yr starting in 2019 (Kibawa, 2016, 2017, 2018; Cornish, 2017c).

Gécamines and joint-venture partner Enterprise Generale Malta Forrest SPRL (EGMF) produced cobalt and copper at La Société pour le Traitement du Terril de Lubumbashi's (STL) Big Hill tailings treatment plant in Lubumbashi. Cobalt production was 5,065 t in 2015; output decreased by an estimated 29% in 2016 and by an additional 30% in 2017. STL also produced germanium at the estimated rate of 21 t/yr in 2015, 15 t/yr in

2016, and 11 t/yr in 2017 (table 1; Kibawa, 2016, 2017, 2018; Moore Stephens LLP, 2017, p. 151).

Mawson West started mining at the Kapulo project in the first quarter of 2015. By yearend, the company produced 13,790 t of copper and 2,072 kilograms (kg) of silver in concentrate. Mawson West produced 5,468 t of copper and 835 kg of silver at Kapulo in 2016 before placing the mine on care-and-maintenance status because of low copper prices. Mining was expected to restart at Kapulo in September 2017. As of yearend, it was unclear if mining had restarted (Mawson West Ltd., 2016, p. 1–2, 4).

Black copper, which is a form of smelted copper that has a copper content of between 80% and 98%, was produced by numerous companies in the former Katanga Province. Some companies produced black copper from concentrate sourced at their own mines and others sourced concentrate from artisanal miners. In 2017, Rubamin SPRL (a subsidiary of Rubamin Ltd. of India) produced nearly 18,000 t of copper in black copper and Congo Dongfang International Mining SPRL (CDM) of China produced about 7,300 t (Moore Stephens LLP, 2017, p. 153; Kibawa, 2018).

CDM, Congo International Mining Corp. (CIMCO), La Minière de Kalumbwe Myunga (MKM), Societe Minière du Katanga SPRL (Somika) of India, and other companies operated small copper refineries in Haut-Katanga and Lualaba Provinces. CNMC Huachin Mining Mabende's production of refined copper increased to 29,765 t in 2017 from 23,697 t in 2016; MKM's, to 25,723 t from 19,431 t; Compagnie Minière de Luisha's (COMILU), to 21,358 t from 20,606 t; Somika's, to 18,352 t from 15,478 t; CDM's, to 17,753 t from 12,732 t; and Kai Peng Mining Ltd.'s, to 16,909 t from 12,330 t. CIMCO's production decreased to 2,388 t in 2017 from 11,926 t in 2016 (Kibawa, 2017, 2018).

CDM processed cobalt ore purchased from artisanal miners to cobalt concentrate and cobalt hydroxide. In 2017, the company produced an estimated 7,800 t of cobalt, which was nearly unchanged from that of 2016. Macrolink Jiayuan Mining SARL of China produced 3,400 t of cobalt in concentrate in 2017 compared with nearly 1,600 t in 2016. Metal Mines and Somika produced an estimated 2,000 t each of cobalt in concentrate in 2017 (Frankel, 2016; Kibawa, 2017, 2018; Moore Stephens LLP, 2017, p. 151, 153, 157).

Katanga Mining Ltd. of Switzerland produced copper and cobalt at the KOV open pit mine, the KTO underground mines, and the Luilu refinery. In September 2015, the company placed its processing operations on care-and-maintenance status during the construction phase of its Whole Ore Leach project. The Whole Ore Leach project was commissioned in December 2017; Katanga Mining planned to produce an average of 300,000 t/yr of refined copper and 30,000 t/yr of cobalt in hydroxide. Katanga Mining planned to produce 150,000 t of refined copper and 11,000 t of contained cobalt in 2018 and 300,000 t of refined copper and 34,000 t of contained cobalt in 2019 (Katanga Mining Ltd., 2017).

In May 2017, Cape Lambert Resources Ltd. of Australia signed a joint-venture agreement with Paragon Mining to develop the Kasombo project and the Kipushi tailings project. The companies planned to produce 8,000 t/yr of copper and 4,000 t/yr of cobalt by retreating tailings from Kipushi for a

period of between 7 and 8 years. Production could start by August 2018. Kasombo was a hard-rock project located between 3 and 5 kilometers (km) from the Kipushi processing plant; development depended on the results of a drilling program (Cornish, 2017b).

In October 2017, Nzuri Copper Ltd. of Australia completed a feasibility study on a new mine at its Kalongwe project. In the first stage of mining, production was expected to be more than 19,000 t/yr of copper and 1,500 t/yr of cobalt in concentrate. The life of the first phase was estimated to be 7 years. Nzuri Copper also was considering a second phase of mining in which refined copper would be produced at an SX–EW plant. Estimated reserves at Kalongwe were 6.98 Mt at a grade of 3.03% copper and 0.36% cobalt (Kotze, 2018).

In November 2017, Ivanhoe Mines Ltd. of Canada completed a new preliminary economic assessment (PEA) on a two-stage mining operation at its Kakula and Kamoa deposits. Under the PEA, the first mine would be developed at Kakula with a capacity of 6 million metric tons per year (Mt/yr) of ore. The second mine, with a capacity of 6 Mt/yr of ore, would be developed at Kamoa. Depending on the results of further studies, total production at Kakula and Kamoa could be more than 500,000 t/yr of copper in blister. The estimated capital cost of the mine at Kakula was \$1.2 billion. The life of the project was estimated to be more than 44 years (Engineering & Mining Journal, 2018).

Gold.—Artisanal and small-scale miners produced gold in Ituri, Maniema, Nord-Kivu, Sud-Kivu, and Tanganyika Provinces in eastern Congo (Kinshasa). Most of the gold exported from artisanal production was undeclared. Production by artisanal miners in eastern Congo (Kinshasa) was estimated to be nearly 12,000 kilograms per year of gold between 2013 and 2015 (Weyns and others, 2016, p. 4).

IPIS' survey between 2013 and 2017 reported that gold was produced at 1,431 mines in eastern Congo (Kinshasa). The Paris Soir-Bagdad Mine in Sud-Kivu Province employed about 5,000 miners; the Misisi Mine, nearly 3,800; the Bigobe Mine, 3,500; the Ngoma Mine, nearly 2,800; and the Carrière G7 Nord Mine, 2,500. The Musigha Mine in Nord-Kivu Province employed more than 16,000 miners; the 7 eme Seau Mine, 3,000; and the Omate Mine, 2,200 (Matthysen and others, 2018).

AngloGold Ashanti Ltd. of South Africa and Randgold Resources Ltd. of the United Kingdom started operations at the Kibali Mine in 2013. The companies produced 18,545 kg of gold in 2017 compared with 18,225 kg in 2016 and 19,991 kg in 2015; decreased production in 2016 and 2017 compared with that of 2015 was partially attributable to lower ore grades. Planned production was more than 22,000 kg in 2018 (van Vuuren, 2018).

Banro Corp. of Canada operated the Twangiza Mine in Sud-Kivu Province; the company produced 3,417 kg of gold in 2017 compared with 3,248 kg of gold in 2016. The increase in production was partially attributable to higher recovery rates. The company also operated the Namoya Mine in Sud-Kivu Province; production decreased to 2,150 kg in 2017 from 2,900 kg in 2016. Namoya's production was limited in the

fourth quarter of 2017 by civil unrest (Kilian, 2017; Banro Corp., 2018).

In July 2017, Amani Gold Ltd. of Australia estimated that resources at its Kebigada prospect were 48.7 Mt at a grade of 1.5 grams per metric ton gold. Kebigada was part of the Giro project, which was located in Haut-Uele Province. Amani Gold hoped to identify total resources of at least 93,000 kg of contained gold at the Giro project (Kotze, 2017).

Niobium (Columbium) and Tantalum.—In 2017, Congo (Kinshasa)’s production of columbite-tantalite decreased to 2,174 t from 2,414 t in 2016. Production decreased in Tanganyika Province to 516 t in 2017 from 897 t in 2016 and to 1 t from 32 t in Maniema Province. Nord-Kivu Province’s production increased to 1,284 t in 2017 from 1,220 t in 2016; Haut-Katanga Province’s, to 308 t from 237 t; and Sud-Kivu Province’s, to 65 t from 29 t (République Démocratique du Congo Ministère des Mines, 2017, p. 47; 2018, p. 50, 59).

IPIS’ survey reported a total of 153 columbite-tantalite mines in eastern Congo (Kinshasa); columbite-tantalite also was mined as a coproduct of cassiterite or wolframite at 91 mines. Columbite tantalite was produced at 79 mines in Tanganyika Province and 75 mines in Nord-Kivu Province. In Nord-Kivu Province, the D4 Gakombe Mine employed about 3,500 miners; the Ngoriba, 500; and the Luwowo-Gasara, 270. A total of nearly 1,200 miners were employed at 14 columbite-tantalite mines near Katatu in Tanganyika Province (Matthysen and others, 2018).

Niobium and tantalum were also contained in cassiterite. Based on historical production of niobium and tantalum from slag at smelters in Congo (Kinshasa), the estimated tantalum and niobium content of cassiterite in 2017 was 280 t and 190 t, respectively. In 2016, the estimated tantalum and niobium content of cassiterite was 180 t and 120 t, respectively (World Mining, 1979; Ellis, 1981; République Démocratique du Congo Ministère des Mines, 2018, p. 48).

Tin.—Artisanal and small-scale miners produced cassiterite in Haut-Katanga, Haut-Lomani, Maniema, Nord-Kivu, Sud-Kivu, and Tanganyika Provinces. Cassiterite production increased to 18,893 t in 2017 from 11,824 t in 2016 and 8,304 t in 2015. Production in Tanganyika Province increased to 6,636 t in 2017 from 2,647 t in 2016; in Haut-Katanga Province, to 3,286 t from 2,984 t; in Maniema Province, to 3,017 t from 2,160 t; and in Sud-Kivu Province, to 2,819 t from 1,944 t. In Nord-Kivu Province, production decreased to 1,555 t in 2017 from 2,089 t in 2016. In Haut-Lomani Province, production was 1,579 t in 2017 (République Démocratique du Congo Ministère des Mines, 2017, p. 45; 2018, p. 48, 59).

IPIS’s survey reported a total of 507 cassiterite mines in eastern Congo (Kinshasa); cassiterite also was mined as a coproduct of columbite-tantalite, gold, tourmaline, or wolframite at 52 mines. In the Manono Territory of Tanganyika Province, the Mille Beches Mine employed 1,000 miners; the Congo Mine, 800 miners; the Musafiri Mine, 600; and the Djibende and Malenge Mines, 500 each. The Kalimbi Mine in Sud-Kivu Province employed 1,000 miners; the Kachuba Mine, 800; the Kasenge Mine, 700; and the Nzombe Mine, 500. The Kalay Boeing-Mont Agoma Mine in Nord-Kivu Province

employed 1,200 miners, and the Bisie Mpama Mine, more than 1,100 (Matthysen and others, 2018).

In 2017, Alphamin Resources Corp. of Mauritius was engaged in construction of a new underground mine at the Mpama North deposit, which was part of the Bisie project in Nord-Kivu Province. Alphamin planned to produce about 9,600 t/yr of tin in concentrate at Mpama North during the estimated mine life of nearly 12 years. Mining was expected to start in early 2019. Resources at Mpama North were estimated to be 5.1 Mt at a grade of 4.5% tin. Estimated capital costs of the mine were \$160 million (Cornish, 2017a).

Tungsten.—Wolframite was mined in Maniema, Nord-Kivu, and Sud-Kivu Provinces. Congo (Kinshasa)’s production of wolframite increased to 252 t in 2017 from 154 t in 2016 and 106 t in 2015. Production in Sud-Kivu Province was 120 t in 2017; Nord-Kivu Province, 80 t; and Maniema Province, 52 t (République Démocratique du Congo Ministère des Mines, 2018, p. 52, 59).

Zinc.—Cape Lambert and Paragon were engaged in a joint venture to develop the Kipushi tailings project. The companies planned to produce 2,000 t/yr of zinc by re-treating tailings; production could start by August 2018 (Cornish, 2017b).

In December 2017, Ivanhoe completed a prefeasibility study on reopening the Kipushi zinc-copper mine, which was located 30 km southwest of Lubumbashi. Depending on the results of a feasibility study, Ivanhoe could produce about 225,000 t/yr of zinc in concentrate during the estimated 11-year mine life. The company planned to complete its feasibility study in the second half of 2018. Resources at the Big Zinc deposit at Kipushi were estimated to be 10.2 Mt at a grade of 34.9% zinc. Capital costs of reopening the mine were estimated to be \$337 million (Moore, 2017).

Industrial Minerals

Cement.—National cement production increased to 899,533 t in 2017 from a revised 253,201 t in 2016. Increased output was attributable to the opening of new plants. The plant owned by Lucky Cement Ltd. of Pakistan and Groupe Rawji opened in October 2016 and had a capacity of 1.26 Mt/yr. The plant was located at Songololo in Bas-Congo Province. PPC Ltd. of South Africa and Barnet Group completed construction of a new plant with a capacity of 1 Mt/yr near Kimpese in 2017 (International Cement Review, 2017, 2018; Banque Centrale du Congo, 2018, p. 40).

Diamond.—Artisanal and small-scale miners accounted for most Congolese output of diamond. In 2017, artisanal and small-scale diamond production was 15.4 million carats compared with 12.4 million carats in 2016. Miners in Kasai-Oriental Province produced 12.2 million carats in 2017; Kasai Province, 2.01 million carats; Kasai Central Province, about 971,000 carats; Kwango Province, about 98,000 carats; and Tshopo Province, about 81,000 carats (République Démocratique du Congo Ministère des Mines, 2017, p. 8; 2018, p. 11).

Societe Anhui-Congo d’Investissement Minier SPRL (SACIM) (Anhui Foreign Economic Construction Group of China, 50%, and Government-owned Société Congolaise d’Investissement Minier, 50%) produced diamond at the Tshibwe Mine in Kasai-Oriental Province. In 2017, SACIM

produced about 3.24 million carats compared with 2.76 million carats in 2016. The company planned to increase its output to 6 million carats per year (République Démocratique du Congo Ministère des Mines, 2017, p. 4; 2018, p. 8, undated, p. 12, 14).

MIBA mined mostly industrial and near-gem-quality diamond at Mbuji-Mayi in Kasai-Oriental Province. In 2017, the company produced 72,262 carats from its alluvial deposits compared with 188,376 carats in 2016. Société Minière de Lupatapata's output decreased to 51,967 carats in 2017 from 198,259 carats in 2016 (République Démocratique du Congo Ministère des Mines, 2017, p. 4; 2018, p. 8).

Gemstones.—Artisanal miners produced amethyst and tourmaline at Rwangara and Shakubangwa in Nord-Kivu Province; amethyst production was sporadic. Tourmaline also was mined in other locations, including Sud-Kivu Province. After a rush in the second half of 2014, production decreased at Rwangara and Shakubangwa in 2015 and nearly shut down in 2016. Small amounts of tourmaline were mined at Rubaya in Nord-Kivu Province as a byproduct of industrial minerals mining. Starting in June 2017, mining of gem-quality bicolored and tricolored tourmaline increased at Rubaya (Laurs and others, 2017).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

Minerals in the National Economy

In 2018, the GDP of Congo (Kinshasa) was about \$41.6 billion.¹ The mining and mineral processing sector accounted for 19.7% of the GDP in 2018. The principal mineral commodities exported from Congo (Kinshasa) were (in decreasing order of value) copper, cobalt, gold, crude petroleum, and diamond (African Development Bank Group, 2019).

In March 2018, the President of Congo (Kinshasa) signed law No. 18/001 of March 9, 2018, which was the country's new mining code. The new law increased royalties for precious metals to 3.5% from 2.5% and for nonferrous and base metals, to 3.5% from 2%. The law also introduced a royalty of 10% on minerals deemed to be strategic by the Government, which included cobalt, germanium, niobium, and tantalum. Other provisions included a reduction in duration of mining licenses to 25 years from 30 years; a reduction of the guaranteed period for contract stability to 5 years from 10 years; an increase in the Government's free-carried and nondilutable share in mining projects to 10% from 5%; and a 50% tax on windfall profits. Under the new law, exploration licenses were renewable only once (Asselineau, 2018; Thomson Reuters, 2018).

Production

In 2018, the production of cement increased by 105%; tungsten, by an estimated 50%; mined cobalt, by an estimated 30%; gold, by an estimated 18%; refined copper, by nearly 15%; mined copper, by an estimated 13%; smelted copper, by an estimated 12%; and crude petroleum, by 11%.

Manganese production restarted in 2018. Germanium and zinc production decreased by 91% each in 2018; diamond, by 21%; refined cobalt, by 50%; and tin, by an estimated 11% (table 1).

Cement production increased in 2018 because of the opening of new plants in 2016 and 2017. Mined cobalt production increased because of the opening of new mines and the reopening of previously closed mines. Higher sulfuric acid output was attributable to increased use in copper refining. Decreased germanium and zinc production was attributable to the closure of the Big Hill operations.

Commodity Review

Metals

Cobalt and Copper.—Katanga Mining produced 152,358 t of refined copper and 11,112 of cobalt in hydroxide in 2018. In the fourth quarter of 2018, Katanga Mining suspended its sales of cobalt because uranium levels in its cobalt hydroxide exceeded the limits allowed in the main ports used by the company for exports. Planned cobalt production for 2019 was 26,000 t. Depending on Government authorization and the results of a feasibility study, Katanga Mining planned to start a new ion-exchange plant to reduce uranium levels in the fourth quarter of 2019 (Katanga Mining Ltd., 2019).

In 2018, Chemaf's cobalt production increased to an estimated 7,800 t in 2018 from 5,160 t in 2017. Chemaf planned to open a new mine at its Mutoshi project in Lualaba Province in October 2019. The company planned to produce 20,000 t/yr of refined copper and 16,000 t/yr of cobalt in hydroxide at Mutoshi (Chemaf SPRL, 2018, p. 9, 13; Roskill Information Services Ltd., 2018).

In 2018, Jinchuan produced 24,108 t of copper and 4,752 t of cobalt at Ruashi compared with 31,546 t of copper and 4,638 t of cobalt in 2017. The company started large-scale mining at the Kinsenda Mine in 2018 and produced 27,492 t of copper by yearend. Jinchuan also approved the Musonoi project, which was expected to start construction in 2019 and production in 2022. Planned production was 38,000 t/yr of copper and 7,800 t/yr of cobalt (Jinchuan Group International Resources Co. Ltd., 2019a, p. 9, 14, 19; 2019b, p. 13).

In the fourth quarter of 2018, ERG completed the RTR project. In the first phase of the project, ERG planned to produce 77,000 t/yr of refined copper and 14,000 t/yr of cobalt in hydroxide. The company could increase production to 120,000 t/yr of copper and 24,000 t/yr of cobalt in the second phase of the project. ERG also produced 102,058 t of copper in concentrate at Frontier and 26,206 t of refined copper and 4,800 t of cobalt at Mukondo Mountain in 2018 (Kibawa, 2016; Moore Stephens LLP, 2017, p. 151, 153, 157; Division Provinciale des Mines de Haut-Katanga, 2019; Eurasian Resources Group, 2019a, b).

In 2018, production at Tenke Fungurume was 168,309 t of copper and 18,747 t of cobalt compared with 213,843 t of copper and 16,419 t of cobalt in 2017. Mutanda produced 199,000 t of copper and 27,300 t of cobalt in 2018 compared with 192,100 t of copper and 23,900 t of cobalt in 2017 (China Molybdenum Company Ltd., 2018, p. 18; 2019, p. 18; Glencore plc, 2019, p. 10).

¹Where necessary, values have been converted from Congolese francs (CDF) to U.S. dollars (US\$) at an average exchange rate of CDF1,839.41=US\$1.00 for 2018.

In 2018, Sicomines produced about 81,000 t of copper, of which 58,562 t was refined. Shituru Mining produced 34,592 t of refined copper in 2018; CNMC Huachin Mining Mabende, 32,318 t; and COMILU, 28,023 t (Division Provinciale des Mines de Haut-Katanga, 2019).

CDM's production of cobalt in hydroxide was about 7,000 t in 2018. Metal Mines produced about 6,300 t of cobalt in concentrate and hydroxide in 2018; Comika Mining SAS, about 3,200 t; and Somika, about 3,100 t. Minière de Kasombo and MPC started operations in 2018 and produced about 2,300 t and 2,100 t of cobalt, respectively (Kibawa, 2016; Moore Stephens LLP, 2017, p. 151, 153, 157; Division Provinciale des Mines de Haut-Katanga, 2019).

Gold.—AngloGold Ashanti's and Randgold's production at the Kibali Mine increased to 25,108 kg in 2018 from 18,545 kg in 2017. Increased production was attributable to higher ore grades and recovery rates (Randgold Resources Ltd., 2019, p. 10–11).

Niobium (Columbium) and Tantalum.—In 2018, columbite-tantalite production increased to 2,267 t from 2,174 t in 2017. Mining started in Haut-Lomani Province in 2018; production was 623 t. In Sud-Kivu Province, output increased to 269 t in 2018 from 65 t in 2017. Production decreased to 881 t in 2018 from 1,284 t in 2017 in Nord-Kivu Province, to 260 t from 308 t in Haut-Katanga Province, and to 210 t from 516 t in Tanganyika Province. The estimated tantalum content of cassiterite in 2018 was 240 t (World Mining, 1979; Ellis, 1981; République Démocratique du Congo Ministère des Mines, 2018, p. 48, 50, 59; 2019).

Tin.—Cassiterite production decreased to 16,273 t in 2018 from 18,893 t in 2017. Production in Haut-Katanga Province decreased to 1,591 t in 2018 from 3,286 t in 2017; in Tanganyika Province, to 1,251 t from 6,636 t; and in Nord-Kivu Province, to 975 t from 1,555 t. Production in Haut-Lomani Province increased to 4,720 t in 2018 from 1,579 t in 2017; in Maniema Province, to 3,954 t from 3,017 t; and in Sud-Kivu Province, to 3,342 t from 2,819 t (République Démocratique du Congo Ministère des Mines, 2018, p. 48, 59; 2019).

Industrial Minerals

Diamond.—In 2018, artisanal and small-scale diamond production decreased to 11.9 million carats from 15.4 million carats in 2017. Production in Kasai-Oriental Province was 9.55 million carats in 2018 compared with 12.2 million in 2017, and that in Kasai Province was about 765,000 carats compared with 2.01 million carats in 2017 (République Démocratique du Congo Ministère des Mines, 2018, p. 11; 2019).

Outlook

Cobalt and copper output in Congo (Kinshasa) are expected to increase in the near future. At least seven companies planned to increase or start copper mining, and at least six planned to increase or start cobalt mining. The Bisie project could increase tin production starting in 2019. The opening of new plants is expected to result in increased cement production in 2019. Diamond mining also could increase because of the expansion at Tshibwe.

The development of these projects depends heavily upon political and economic stability and favorable conditions in world markets. The outlook for gold, niobium, tantalum, tin, and tungsten is particularly dependent upon political stability because of continued civil unrest in eastern Congo (Kinshasa) and upon international concerns about the reported use of minerals to finance military operations.

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TABLE 1
CONGO (KINSHASA): PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018
METALS					
Cobalt:					
Mine, Co content, recoverable ³	65,000 ^r	72,000 ^r	68,000 ^r	80,000	104,000
Refinery, metal ⁴	2,859	3,141	50 ^r	120	60
Copper:					
Mine, Cu content: ⁵					
Concentrates ^e	164,000 ^r	168,000 ^r	212,000 ^r	276,000	280,000
Solvent extraction ⁶	866,407	870,589	811,274	818,730	945,607
Total ^c	1,030,000	1,040,000	1,020,000	1,090,000	1,230,000
Smelter, primary, black	56,000 ^r	34,000 ^r	26,000	42,000	47,000
Refinery, primary:					
Electrowon	866,407	870,589	811,274	818,730	945,607
Other	11,559	15,347	10,039	11,757	7,631
Total	878,000	886,000	821,000	830,000	953,000
Germanium, mine, Ge content ^c kilograms	21,000	21,000	15,000	11,000	1,000
Gold, mine, Au content ^c do.	36,000 ^r	40,000 ^r	39,000 ^r	39,000	46,000
Lead, mine, Pb content ⁷	764	653	101	--	--
Manganese, mine, ore ⁸	--	--	--	--	14,884
Niobium and tantalum, mineral concentrate:					
Cassiterite:					
Gross weight	7,295	8,304	11,824	18,893	16,273
Nb content	74 ^r	84 ^r	120	190	160
Ta content	110	125 ^r	180	280	240
Columbite-tantalite:					
Gross weight	1,140	2,102	2,414	2,174	2,267
Nb content	200	370	420	380	400
Ta content	250	465 ^r	530	480	500
Silver, mine, Ag content kilograms	6,492	2,412	835	-- ^e	-- ^e
Tin, mine:					
Gross weight	7,295	8,304	11,824	18,893	16,273
Concentrate, Sn content ^c	4,400	5,000	7,100	11,000	9,800
Tungsten, mine:					
Gross weight	16	106	154	252	380
Concentrate, W content ^c	8	51 ^r	73	120	180
Zinc, mine, Zn content	12,737	12,675	12,587	12,337	1,129 ⁷
INDUSTRIAL MINERALS					
Cement, hydraulic	329,205 ^r	398,749	253,201 ^r	899,533	1,842,782
Diamond, by type:					
Artisanal thousand carats	14,689	14,284	12,377	15,415	11,929
Large-scale do.	244	1,505	3,182	3,688	3,202
Gemstones, tourmaline ^c	35	28	14	14	14
Stone, crushed, unspecified	285,100	306,800 ^r	326,100 ^r	340,000 ^e	340,000 ^e
Sulfur, compounds, sulfuric acid ^e	3,000,000	3,000,000	2,800,000	2,900,000	3,300,000
MINERAL FUELS AND RELATED MATERIALS					
Coal, bituminous	5,600 ^r	6,900 ^r	8,200 ^r	8,000 ^e	8,000 ^e
Petroleum, crude thousand 42-gallon barrels	8,362	8,247	7,837	7,536	8,393

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

¹Table includes data available through September 5, 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, amethyst and crude construction materials, including brick may have been produced, but available information was inadequate to make reliable estimates of output.

³Determined from estimated cobalt content of ores, concentrates, refined cobalt metal, and intermediate products such as crude cobalt alloys, crude cobalt hydroxide, and crude cobalt carbonate, produced from cobalt ores and concentrates, tailings, and slags sourced from Congo (Kinshasa).

⁴Does not include production of cobalt in alloys, carbonate, hydroxide, and other materials that would require further refining.

⁵Recoverable content.

⁶The copper content of solvent extraction output at the mine level is the same as electrowon refinery output because copper produced in the solvent extraction and electrowinning process is typically reported only at the refinery level.

⁷Reported exports.

TABLE 2
CONGO (KINSHASA): STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Lucky Cement Ltd. and Groupe Rawji	Plant at Songololo in Bas-Congo Province	1,260,000.
Do.	PPC Barnet DRC Manufacturing SA (PPC Ltd., 69%, and Barnet Group, 21%)	Plant near Kimpese	1,000,000.
Do.	Cimenterie de Lukala (HeidelbergCement AG, 85%)	Lukala plant near Kinshasa	420,000.
Do.	Interlacs (HeidelbergCement AG, 85%)	Kabimba plant near Lubumbashi	50,000.
Do.	Cimenterie Nationale SARL (Nova Cimangola, 58%)	Kimpese plant, 40 kilometers south of Kinshasa ¹	300,000.
Do.	Ciment et Matériaux du Katanga [Entreprise Malta Forrest SPRL (EGMF), 50.27%, and Générale des Carrières et des Mines SA (Gécamines), 49.73%]	Lubudi plant in Lualaba Province	87,000.
Coal	La Générale des Carrières et des Mines SA (Gécamines)	Luena Mine in Haut-Katanga Province	NA.
Copper and cobalt:			
Mine	Katanga Mining Ltd. (Glencore International AG, 75.2%, and Générale des Carrières et des Mines (Gécamines), 24.8%)	KOV, KTO, ¹ and Mashamba East Mines near Kolwezi	300,000 copper; 30,000 cobalt.
Do.	Tenke Fungurume Mining SARL [China Molybdenum Co. Ltd., 80%, and Générale des Carrières et des Mines (Gécamines), 20%]	Tenke Fungurume Mine in Lualaba Province	225,000 copper; 18,000 ^c cobalt.
Do.	Mutanda Mining SPRL (Glencore plc, 100%)	Mutanda Mine in Lualaba Province	220,000 ^c copper; 28,000 ^c cobalt.
Do.	Eurasian Resources Group (ERG)	Frontier Mine in Haut-Katanga Province	100,000 copper.
Do.	do.	Roan Tailings Retreatment project near Kolwezi	77,000 copper; 14,000 cobalt.
Do.	Boss Mining SPRL [Eurasian Resources Group plc, 70%, and Générale des Carrières et des Mines SA (Gécamines), 30%]	Mukondo Mountain Mine near Kakanda	40,000 ^c copper; 10,000 ^c cobalt.
Do.	Sicomines [China Railway Group Ltd. and Sinohydro Corp., 68%, and La Générale des Carrières et des Mines SA (Gécamines) and Société Immobilière du Congo, 32%]	Mashamba West Mine in Lualaba Province	125,000 copper.
Do.	MMG Ltd.	Kinsevere Mine near Kinke	80,000 copper.
Do.	Ruashi Mining SPRL (Jinchuan Group International Resources Co. Ltd., 75%)	Ruashi Mine near Lubumbashi	38,000 copper; 5,000 cobalt.
Do.	Jinchuan Group International Resources Co. Ltd., 77%	Kinsenda Mine in Haut-Katanga Province	24,000 copper
Do.	Chemaf SPRL (subsidiary of Shalina Resources Ltd.)	Etoile Mine near Lubumbashi	51,500 copper; 8,700 ^c cobalt.
Do.	La Compagnie Minière de Musonoie Global SAS (Zijin Mining Group Company Ltd., 72%)	Kolwezi Mine in Lualaba Province	50,000 copper; 3,000 cobalt.
Do.	Congo Dong Fang International Mining sprl	Plants in former Katanga Province	45,000 ^c copper; 8,700 ^c cobalt.
Do.	Shituru Mining Corp. SPRL	Shituru Mine in Haut-Katanga Province	40,000 ^c copper.
Do.	Anvil Mining Congo SARL (Mawson West Ltd., 90%)	Dikulushi Mine ¹ near Lake Mweru	20,000 copper.
Do.	do.	Kapulo Mine ¹ near Kapulo	19,400 copper.
Do.	CNMC Huachin Mining Mabende	Mine at Mabende	33,000 ^c copper.

See footnotes at end of table.

TABLE 2—Continued
CONGO (KINSHASA): STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper and cobalt:—Continued				
Mine—Continued				
		Tiger Resources Ltd., 60%, and La Générale des Carrières et des Mines SA (Gécamines), 40%	Kipoi Mine in Haut-Katanga Province	32,500 copper.
Do.		La Minière de Kalumbwe Myunga (MKM)	Mine near Kolwezi	29,000 ^c copper.
Do.		CNMC-Mabende Metal Leach SPRL	Plant at Lwisha	20,000 copper.
Do.		La Générale des Carrières et des Mines SA (Gécamines)	Kamfundwa and Kilamusembu Mines	20,000 ^c copper; 900 ^c cobalt.
Do.		Société Minière du Katanga SPRL (Somika)	Mine near Lubumbashi	20,000 ^c copper; 3,500 ^c cobalt.
Do.		La Société pour le Traitement du Terril de Lubumbashi (STL) [Enterprise Générale Malta Forrest SPRL (EGMF), 70%, and La Générale des Carrières et des Mines SA (Gécamines), 30%]	Big Hill tailings treatment plant at Lubumbashi ¹	3,500 copper; 5,500 cobalt.
Do.		Metals Mines	Mines in Haut-Katanga Province	7,000 ^c cobalt.
Do.		Macrolink Jiayuan Mining SARL	do.	3,800 ^c cobalt.
Do.		Comika Mining SAS	do.	3,600 ^c cobalt.
Do.		Minière de Kasombo	do.	2,600 ^c cobalt.
Do.		MPC	Mines in former Katanga Province	2,400 ^c cobalt.
Do.		Feza Mining SPRL	do. ¹	1,000 ^c cobalt.
Smelted		La Compagnie Minière de Musonoie Global SAS	Plant in Lualaba Province	32,000 ^c copper.
Do.		Congo Dongfang International Mining SPRL	Plant in Lubumbashi	30,000 ^c copper.
Do.		Rubamin SPRL	Plant in Likasi	25,000 copper.
Refined		Katanga Mining Ltd.	Luilu plant near Kolwezi	300,000 copper.
Do.		Tenke Fungurume Mining SARL	Plant near Tenke Fungurume Mine	225,000 copper.
Do.		Mutanda Mining SPRL	Plant near Mutanda Mine	200,000 copper.
Do.		Sicomines	Plant near Mashamba West Mine	80,000 ^c copper.
Do.		MMG Ltd.	Kinsevere plant near Kinke	80,000 ^c copper.
Do.		Eurasian Resources Group	Plant at Roan Tailings Retreatment	77,000 copper.
Do.		Chemaf SPRL	Usoke plant in Lubumbashi	51,500 copper.
Do.		Boss Mining SPRL	Luita plant near Kakanda	40,000 copper.
Do.		Shituru Mining Corp. SPRL	Plant in former Katanga Province	40,000 ^c copper.
Do.		Ruashi Mining SPRL	Ruashi plant near Lubumbashi	38,000 copper.
Do.		CNMC Huachin Mining Mabende	Plant at Mabende	33,000 ^c copper.
Do.		Tiger Resources Ltd., 60%, and La Générale des Carrières et des Mines (Gécamines), 40%	Plant near Kipoi Mine	32,500 copper.
Do.		Compagnie Minière de Luisha (COMILU)	Plant near Kolwezi	31,000 ^c copper.
Do.		Congo International Mining Corp.	Plant in former Katanga Province	30,000 copper.
Do.		La Minière de Kalumbwe Myunga (MKM)	Plant near Kolwezi	29,000 ^c copper.
Do.		La Générale des Carrières et des Mines SA (Gécamines)	Shituru plant near Likasi	21,600 copper.
Do.		do.	Fonderie Electrique de Panda cobalt plant	1,200 cobalt.
Do.		CNMC-Mabende Metal Leach SPRL	Plant at Lwisha	20,000 copper.
Do.		Société Minière du Katanga SPRL (Somika)	Plant near Lubumbashi	20,000 ^c copper.
Do.		Kai Peng Mining Ltd.	Plant at Likasi ¹	19,000 ^c copper.
Diamond	carats	Artisanal miners	Mines in Kasai-Oriental Province	13,000,000. ^c
Do.	do.	do.	Mines in Kasai Province	2,200,000. ^c
Do.	do.	do.	Mines in Kasai-Central Province	1,400,000. ^c
Do.	do.	do.	Mines in Kwango Province	150,000. ^c
Do.	do.	do.	Mines in Tshopo Province	130,000. ^c
Do.	do.	Societe Anhui-Congo d'Investissement Minier SPRL (SACIM) [Anhui Foreign Economic Construction Group, 50%, and Société Congolaise d'Investissement Minier, 50%]	Tshibwe Mine in Kasai-Oriental Province	6,000,000.

See footnotes at end of table.

TABLE 2—Continued
CONGO (KINSHASA): STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Diamond— Continued	carats	Société Minière de Bakwanga (MIBA) [Government, 80%, and Sibeka Group (Mwana Africa plc), 20%]	Mines at Mbuji-Mayi in Kasai-Oriental Province	900,000.
Do.	do.	Société Minière de Lupatapata (SMDL)	Mines in Kasai-Oriental Province ¹	220,000. ^c
Gemstones:				
Amethyst		Artisanal and small-scale miners	Mines at Rwangara and Shakubangwa in Nord-Kivu Province	NA.
Tourmaline	kilograms	do.	do.	15. ^c
Germanium	do.	La Société pour le Traitement du Terril de Lubumbashi (STL)	Big Hill tailings treatment plant at Lubumbashi ¹	20,000.
Gold	do.	Artisanal and small-scale miners	Mines in various locations, including:	15,000. ^c
Do.	do.	do.	Ituri Province	NA.
Do.	do.	do.	Maniema Province	NA.
Do.	do.	do.	Nord-Kivu Province	NA.
Do.	do.	do.	Sud-Kivu Province	NA.
Do.	do.	do.	Tanganyika Province	NA.
Do.	do.	Coomid, Fametal, and Gold Dragon Resources	Ituri Province ¹	2,000. ^c
Do.	do.	AngloGold Ashanti, 45%, and Randgold Resources Ltd., 45%	Kibali Mine in Ituri Province	29,000.
Do.	do.	Banro Corp.	Namoya Mine in Maniema Province	4,100.
Do.	do.	do.	Twangiza Mine in Sud-Kivu Province	3,500.
Niobium (columbium) and tantalum		Artisanal and small-scale miners	Mines in Nord-Kivu Province	1,500 ^c columbite- tantalite.
Do.		do.	Mines in Tanganyika Province	1,000 ^c columbite- tantalite.
Do.		do.	Mines in Haut-Lomani Province	700 ^c columbite- tantalite.
Do.		do.	Mines in Haut-Katanga Province	340 ^c columbite- tantalite.
Do.		do.	Mines in Sud-Kivu Province	300 ^c columbite- tantalite.
Do.		do.	Mines in Maniema Province	80 ^c columbite- tantalite.
Petroleum, crude	thousand 42-gallon barrels	Perenco REP (subsidiary of Perenco plc) and Congolaise des Hydrocarbures SARL	Kifuku, Kinkasi, Liawenda, Makelekese, Muanda, Nsiamfuma, and Tshiende onshore wells	5,480.
Do.	do.	Muanda International Oil Co. (subsidiary of Perenco plc), 50%; Inpex Corp., 32.3%; ODS Ltd., 17.7%)	Mibale, Motoba, and Tshiala offshore wells	3,650.
Silver, mine	kilograms	Anvil Congo Mining SARL	Dikulushi Mine ¹ near Lake Mweru	60,000.
Do.	do.	do.	Kapulo Mine ¹ near Kapulo	3,000. ^c
Stone, crushed		Chemaf SPRL	Kilimasimba quarry near Lubumbashi	440,000.
Sulfuric acid		Tenke Fungurume Mining SPRL [La Générale des Carrières et des Mines SA (Gécamines)]	Plants at Tenke Fungurume Mine	760,000.
Do.		Ruashi Mining SPRL	Plant at Ruashi Mine	190,000.
Do.		Chemaf SPRL	Plant in Lubumbashi	170,000.
Do.		Mutanda Mining SPRL	Plant at Mutanda Mine	130,000.
Do.		La Générale des Carrières et des Mines SA (Gécamines)	Plant at Likasi	68,000.
Tin, mine		Artisanal and small-scale miners	Mines in Tanganyika Province	7,400 ^c cassiterite.
Do.		do.	Mines in Haut-Lomani Province	5,300 ^c cassiterite.
Do.		do.	Mines in Maniema Province	4,400 ^c cassiterite.
Do.		do.	Mines in Haut-Katanga Province	3,700 ^c cassiterite.
Do.		do.	Mines in Sud-Kivu Province	3,700 ^c cassiterite.
Do.		do.	Mines in Nord-Kivu Province	2,300 ^c cassiterite.

See footnotes at end of table.

TABLE 2—Continued
 CONGO (KINSHASA): STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Tungsten	Artisanal and small-scale miners	Mines in Sud-Kivu Province	240 ^e wolframite.
Do.	do.	Mines in Maniema Province	110 ^e wolframite.
Do.	do.	Mines in Nord-Kivu Province ¹	90 ^e wolframite.
Zinc	La Société pour le Traitement du Terril de Lubumbashi (STL)	Big Hill tailings treatment plant at Lubumbashi ¹	15,000 zinc in zinc oxide.

^eEstimated. Do., do. Ditto. NA Not available.

¹Not operating at the end of 2018.