

2016 Minerals Yearbook

ZAMBIA

THE MINERAL INDUSTRY OF ZAMBIA

By James J. Barry

Zambia's mining sector continued to be dominated by cobalt and copper production. In 2016, the country accounted for 2.7% and 3.8% of world mined cobalt and copper production, respectively. Zambia was a leading gemstone producer globally, particularly of emerald. The country also produced cement, coal, crude steel, semiprecious gemstones, gold, lime, manganese, refined petroleum products, sand and gravel, silver, stone, and sulfur (Flanagan, 2018; Shedd, 2018).

Minerals in the National Economy

In 2016, Zambia's real gross domestic product (GDP) was \$12.6 billion,¹ which was an increase of 3.4% compared with that of 2015. The value of the mining and quarrying sector accounted for 10.5% of real GDP; the sector increased by 7% compared with an increase of 0.3% in 2015 owing to increases in beryl, emerald, and refined cobalt production. A large portion of Zambia's total exports in 2016 was composed of mineral commodities; copper accounted for 67.6% of total exports; gold, 2.9%; and cobalt, 1.7%. Zambia's total exports decreased by about 12%, largely reflected in the 17% decrease in copper exports (Ministry of Finance, 2017, p. 41, 49–50).

The mining sector is regulated by Act No. 11 of 2015 (the Mines and Mineral Development Act of 2015), which replaced Act No. 7 of 2008 (the Mines and Mineral Development Act of 2008). The Mines and Mineral Development Act of 2015 established guidelines for exploration licenses; large- and small-scale mining licenses; import and export permits; mining rights; safety, health, and environmental protections; and mineral-trading permits. In June 2016, the 2015 act was amended by Act No. 14 of 2016 [the Mines and Mineral Development (Amendment) Act of 2016], which redefined the mineral royalty rates to 5% for all base metals (except copper), mineral fuels, and industrial minerals, and to 6% for gemstones and precious metals. For copper, the law establishes a royalty rate of 4% when the copper price (in dollars per metric ton) is below \$4,500, 5% when the price is between \$4,500 and \$6,000, and 6% when the price is above \$6,000. Investment in most types of mineral operations are covered by the Zambia Development Agency Act of 2006, although minerals produced for the construction industry, such as clay, sand, and most types of stone, are excluded. Petroleum exploration and production are regulated by Act No. 10 of 2008 [the Petroleum (Exploration and Production) Act of 2008] (Government of Zambia, 2016; International Comparative Legal Guides, 2017).

Production

Data on mineral production are in table 1. Notable increases in production included that of refined cobalt, which increased

by 58%; beryl, 53%; emerald, 36%; and cement, 29%. Notable decreases in production included that of cobalt (Co content of mine production), which decreased by 65%; coal, 45%; refined copper metal, 26%; raw steel, 21%; and manganese (Mn content), 11%. Additionally, no bismuth was produced in 2016 because the mineralogy of the copper ore sent to the smelter was different than that of previous years. Increased production of refined cobalt and copper metal was a result of increased imports of concentrates for processing (table 1; China Nonferrous Metal Mining (Group) Corporation Ltd., 2017, p. 30).

Structure of the Mineral Industry

Many of the country's large copper mining and processing operations were located in Copperbelt Province in north-central Zambia. The Government retains minority interest in most of the large copper projects through its holding company Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM-IH). The mining sector is administered by the Geological Survey Department, the Mines Development Department, and the Mines Safety Department of the Ministry of Mines and Minerals Development. The Ministry of Commerce, Trade and Industry oversees the industrial manufacturing sector. Data on the capacity and ownership of selected mineral operations are in table 2.

Commodity Review

Metals

Cobalt and Copper.—In 2016, copper production was 596,000 t, which was an increase of 7% compared with that of 2015. The increase was largely attributed to the ramping up of production at the Sentinel Mine. Kansanshi Mining plc (a subsidiary of First Quantum Minerals Ltd.) had the following three operations in Northwestern Province: the Kansanshi Mine, the Kansanshi smelter, and the Sentinel Mine. Output from the Kansanshi Mine included 173,604 metric tons (t) of copper contained in concentrate and 79,668 t of copper cathode compared with 145,688 t and 80,986 t, respectively, in 2015. Total copper production at the Kansanshi Mine increased by 12% to 253,272 t from 226,674 t in 2015. In 2016, the Kansanshi smelter processed 1,143,974 t of concentrate to produce 257,330 t of copper anode. The smelter was designed to process 1.2 million metric tons per year (Mt/yr) of copper concentrate to produce 340,000 metric tons per year (t/yr) of copper metal. The Sentinel Mine was in precommercial production for most of 2016; on November 1, commercial production commenced. The Sentinel Mine produced 139,600 t of copper contained in concentrate compared with 32,971 t in 2015 (First Quantum Minerals Ltd., 2017a, b; 2017c, p. 12, 18).

The joint venture of African Rainbow Minerals Ltd. of South Africa and Vale S.A. of Brazil held an 80% interest (40% by each partner) in Lubambe Copper Mine Ltd.; ZCCM-IH held the remaining 20%. In 2016, Lubambe Copper Mine produced

¹Where necessary, values have been converted from Zambian kwacha (ZMW) to U.S. dollars (US\$) at an annual average exchange rate of ZMW10.284=US\$1.00 for 2016.

18,906 t of copper contained in concentrate compared with 24,987 t in 2015. The 24% decrease in copper production was the result of a concerted effort to reduce monthly milled ore from 130,000 metric tons per month (t/mo) to 80,000 t/mo. The mine management decision was to stop operating losses at Lubambe and to preserve the ore body (African Rainbow Minerals Ltd., 2016a, p. 4, 21, 111, 212; 2016b, p. 23; 2016c, p. 57; 2017, p. 22).

In 2016, Chambishi Metals plc [a subsidiary of Eurasian Resources Group S.a.r.l. (ERG) of Luxembourg] operated the Chambishi cobalt plant located 75 kilometers (km) northwest of Ndola. In 2016, the company produced 4,725 t of cobalt metal compared with 2,997 t in 2015. Increased production was attributed to greater recoveries of reprocessed tailings at ERG's Boss Mine in the Democratic Republic of the Congo [Congo (Kinshasa)], which were processed at Chambishi (table 2; Cobalt Development Institute, 2017; Darton Commodities Ltd., 2017, p. 8).

In 2016, NFC Africa Mining plc, which was a subsidiary of China Nonferrous Metal Mining (Group) Corp. Ltd., commenced construction of the Southeast Chambishi Mine. The mine was expected to be completed in the third quarter of 2018 and to have a designed production capacity of 63,000 t/yr of copper in concentrate. Sino-Metals Leach Zambia Ltd. completed construction of the Mwambashi Strip Mine near Kalulushi in the Copperbelt Province, which was expected to produce 600,000 t/yr of copper ore. In June, the Mwambashi Mine began commercial production. The project was also to include a reconstructed and expanded 730,000-t/yr processing plant. Construction of the plant commenced in April and was expected to be completed in August 2017 (China Nonferrous Metal Mining (Group) Corporation Ltd., 2017, p. 36–37).

In 2016, Konkola Copper Mines plc (KCM), which was a subsidiary of Vedanta Resources plc. of the United Kingdom (79.4% interest), produced a combined 175,000 t of copper cathode at the Nkana refinery and the Nchanga tailings leach plant compared with 184,000 t in 2015. KCM produced 108,000 t of copper contained in mined ore in 2015 compared with 122,000 t in 2015. The decreased mined copper production was largely owing to the Nchanga underground mine being on care-and-maintenance status for most of 2016, although Nchanga resumed trial mining at yearend (Vedanta Resources plc., 2015, p. 6; 2016a, p. 27; 2016b, p. 8; 2017a, p. 94; 2017b, p. 8).

Gold.—In 2016, gold output from the Kansanshi Mine and smelter, which were operated by First Quantum, increased by 9% to 4,610 kilograms (kg) from about 4,238 kg produced in 2015 owing to larger concentrate production and higher ore grades. The Kansanshi Mine was the sole source of gold production in the country. As a result of its acquisition of Lufoto Ltd. of Australia, Cradle Arc Plc of the United Kingdom (formerly Alecto Minerals Plc) held the mining licenses to the Dunrobin and the Matala gold deposits located 120 km west of Lusaka. Alecto Minerals held a 25-year renewable mining license and environmental permit. The company planned to develop an open pit mine with an estimated mine life of 4 years and 8 months and an ore processing capacity of 400,000 t/yr (Alecto Minerals Plc, 2017, p. 5; First Quantum Minerals Ltd., 2017c, p. 18).

Lead and Zinc.—In 2016, BMR Mining plc of the United Kingdom continued with the development of the Kabwe lead-zinc recovery project. In May, BMR Mining's Environmental Social Impact Assessment was approved by the Zambia Environmental Management Agency for the construction of a processing plant at the Kabwe lead and zinc mine. The company planned to commission the plant by yearend 2017, and the plant was expected to process about 44,000 t/yr of tailings to produce lead sponge and zinc cathode, as well as other byproducts. The Kabwe lead and zinc mine was not operating but hosted tailings and slag stockpiles that contained germanium, lead, silver, vanadium, and zinc (BMR Group plc, 2016, p. 4, 6; 2017, p. 1).

Industrial Minerals

Cement.—In 2016, cement production was an estimated 2.7 million metric tons (Mt) compared with a revised 2.1 Mt in 2015. Although domestic demand was slightly lower, cement exports were 10% higher in 2016. Lafarge Zambia Plc operated three cement plants with a combined annual capacity of about 1.5 Mt/yr. In 2016, Lafarge Zambia increased its cement exports by 59%, shipping cement to Burundi, Congo (Kinshasa), Malawi, and Zimbabwe. Dangote Cement Plc of Nigeria, through its subsidiary Dangote Industries (Zambia) Ltd., completed its first full year of production at its 1.5-Mt/yr-capacity Ndola cement plant, located in the Masaiti district near Ndola (Bank of Zambia, 2017, p. 9, 21; Dangote Cement Plc, 2017, p. 62; Lafarge Zambia plc, 2017, p. 2, 4).

Outlook

The output of Zambia's mineral- and metal-processing industries appears to be stabilizing as electricity shortages have been reduced, and stronger reporting requirements are leading to greater transparency about mining practices in Zambia. The mineral sector continues to face an uncertain policy environment, however, as illustrated by the revision of royalty rates in the mining code in as recently as 2016. The landlocked country's ability to encourage renewed foreign direct investment in the mining sector will likely hinge on its ability to develop a stable policy environment and fiscal regime, as well as on the diversification and expansion of the electricity sector.

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TABLE 1
ZAMBIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2012	2013	2014	2015	2016
METALS					
Bismuth, refinery production	--	--	180	40	--
Cobalt:					
Mine production, Co content	5,435	5,919	4,600 ^e	1,700 ^r	600
Refinery production	5,669	5,000	4,317	2,997	4,725
Copper: ³					
Mine output, Cu content:					
By concentration or cementation	517,000	558,900	517,100 ^r	558,600 ^r	596,000 ^e
Leaching, electrowon	178,200 ^r	200,900 ^r	190,000 ^r	158,700 ^r	167,000 ^e
Refinery, primary, other	344,000	327,200 ^r	288,800 ^r	312,800 ^r	231,000 ^e
Smelter production, primary, includes low-grade electrowon	519,200 ^r	520,300 ^r	525,800 ^r	648,800 ^r	698,000 ^e
Gold, mine production, Au content kilograms	4,230	5,210	4,803 ^r	4,238 ^r	4,610
Iron and steel, raw steel	76,400	90,650	91,000 ^e	91,000 ^e	72,000 ^e
Manganese, mine production: ^e					
Gross weight	120,000	120,000	130,000	130,000	120,000
Mn content	40,000	40,000	45,000	45,000	40,000
Silver, mine production, Ag content kilograms	15,000 ^r	16,000 ^r	15,000 ^r	15,000 ^r	15,000
INDUSTRIAL MINERALS					
Cement, hydraulic	1,600,000 ^{r, e}	1,810,000 ^e	2,200,000 ^{r, e}	2,100,000 ^r	2,700,000 ^e
Gemstones:					
Amethyst kilograms	1,050,000	1,150,000	1,150,000	983,707 ^r	964,548
Beryl thousand carats	10,000	9,000	11,000	17,000 ^{r, e}	26,000 ^e
Emerald do.	17,000	17,000	18,000	36,000 ^{r, e}	49,000 ^e
Tourmaline ^e kilograms	21,000	20,000	19,000	18,000	18,000
Lime, calcined ^e thousand metric tons	250	280	300	310	320
Stone, sand, and gravel:					
Sand and gravel, construction, unspecified ^e do.	360	370	375	400	410
Stone, crushed, limestone ^e do.	2,600	2,700	2,900	3,000	3,100
Sulfur compounds, sulfuric acid:					
Gross weight	950,000	975,000	1,015,000	1,700,000 ^{r, e}	1,632,906
S content	310,000	320,000	330,000	550,000	530,000
MINERAL FUELS AND RELATED MATERIALS					
Coal, bituminous	90,000	153,422 ^r	153,151 ^r	103,439 ^r	57,212
Petroleum, refinery production thousand 42-gallon barrels	4,511	4,301	4,825	4,431 ^r	4,500 ^e

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

¹Table includes data available through January 2, 2018. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

²In addition to the commodities listed, clay, lead, palladium, platinum, and selenium may have been produced in Zambia, but available information was inadequate to make reliable estimates of output.

³Terms used are as defined by the International Copper Study Group.

TABLE 2
ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Bismuth	Chambishi Copper Smelter, Ltd. [China Nonferrous Metal Mining (Group) Co. Ltd., 60%, and Yunnan Copper Industry (Group) Co. Ltd., 40%]	Chambishi copper smelter, 75 kilometers northwest of Ndola	NA.
Cement	Dangote Industries (Zambia) Ltd. (Dangote Cement Plc, 100%)	Plant in Ndola, Copperbelt Province	1,500,000.
Do.	Lafarge Zambia plc (Pan African Cement Ltd., 50%, and Financiere Lafarge S.A., 34%)	Chilanga II plant, about 15 kilometers south of Lusaka	830,000.
Do.	do.	Ndola, Copperbelt Province	450,000.
Do.	do.	Chilanga I plant, about 15 kilometers south of Lusaka	200,000.
Do.	Scirocco Enterprises Ltd.	About 18 kilometers southwest of Lusaka	100,000.
Do.	Zambezi Portland Cement Ltd.	Ndola, Copperbelt Province	510,000.
Coal, bituminous	Maamba Collieries Ltd. [Nava Bharat consortium, 65%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM-IH), 35%]	Siankondobo coalfield, 350 kilometers south of Lusaka, Sinazongwe District	400,000.
Do.	Nkandabwe Coal Mine Ltd. [Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM-IH), 100%]	Kandabwe Mine, ¹ near Sinazongwe	240,000.
Copper and cobalt:			
Ore and concentrate	Lubambe Copper Mine Ltd. [African Rainbow Minerals Ltd., 40%; Vale S.A., 40%; Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM-IH), 20%]	Lubambe copper mine, near Chililabombwe	2,500,000 ore, which yields about 45,000 copper in concentrate.
Do.	Jin Tuo Investments Ltd. (Jinchuan Group International Resources Co. Ltd., 100%)	Munali nickel mine, ¹ about 60 kilometers south of Lusaka	1,200,000 ore, which yields about 1,700 copper and 500 cobalt coproduct.
Do.	Chibuluma Mines plc [Metorex Ltd.(Jinchuan Group International Resources Co. Ltd., 100%), 85%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM-IH), 15%]	Chibuluma South Mine, about 12 kilometers west of Kitwe	600,000 ore, which yields about 19,000 copper in concentrate.
Do.	CNMC Luanshya Copper Mines PLC. [NFC Africa Mining plc, 80%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM-IH), 20%]	Baluba Center underground mine ¹	1,500,000 ore.
Do.	do.	Luanshya North Mine, Luanshya	4,500,000 ore.
Do.	do.	Luanshya slag recovery, Luanshya	500,000 slag, which yeilds 3,500 copper in concentrate.
Do.	Kansanshi Mining plc [First Quantum Minerals Ltd., 80%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM-IH), 20%]	Kansanshi Mine, north of Solwezi, Northwestern Province	12,000,000 sulfide ore, 8,800,000 oxide ore, 8,600,000 mixed ore.
Do.	do.	Sentinel Mine, Northwestern Province	NA.
Do.	Konkola Copper Mines plc (KCM) [Vedanta Resources plc., 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM-IH), 19.6%]	Chingola open pit A and Nchanga open pit, Chingola	4,500,000 ore.
Do.	do.	Nchanga underground mine, Chingola	2,800,000 ore.
Do.	do.	Konkola Mine, Chililabombwe	2,400,000 ore.
Do.	do.	Fitwaola open pit, Chingola	NA.
Do.	do.	Reprocessing material from the TD3a, the TD3b, the TD5, and the TD7 tailings dams, Chingola	NA.

See footnotes at end of table.

TABLE 2—Continued
ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper and cobalt:—Continued			
Ore and concentrate— Continued	Lumwana Mining Company Ltd. (Barrick Gold Corp., 100%)	Lumwana Mine (Chimwungo and Malundwe pits), 20 kilometers west of Chingola	21,000,000 ore.
Do.	Mkushi Copper Joint Venture Ltd. (Seringa Mining Ltd., 51%, and Katanga Resources Ltd., 49%)	Mkushi heap leach	NA.
Do.	Mopani Copper Mines plc [Glencore plc, 73.1%; First Quantum Minerals Ltd., 16.9%; Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM—IH), 10%]	Nkana Mine, includes the Central, the Mindola North, the Mindola Sub-Vertical, and the South Ore Body shafts for underground operations, and the Area A, the Area E, and the Mindola open pits, southwest of Kitwe	5,500,000 ore.
Do.	do.	Mufulira Mine	2,500,000 ore.
Do.	NFC Africa Mining plc [China Nonferrous Metal Mining (Group) Co. Ltd., 85%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM—IH), 15%]	Chambishi Main Mine, 75 kilometers northwest of Ndola	2,145,000 ore, which yields about 50,000 copper in concentrate.
Do.	do.	Chambishi West Mine, 75 kilometers northwest of Ndola	990,000 ore.
Metal	Chambishi Metals plc [Eurasian Resources Group, S.a.r.l. (ERG), 90%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM—IH), 10%]	Chambishi cobalt plant, 75 kilometers northwest of Ndola	27,000 copper cathode, 5,500 cobalt metal.
Do.	Chambishi Copper Smelter Company, Ltd. [China Nonferrous Metal Mining (Group) Co. Ltd., 60%, and Yunnan Copper Industry (Group) Co. Ltd., 40%]	Chambishi copper smelter	250,000 copper anode (blister copper).
Do.	CNMC Luanshya Copper Mines PLC. (NFC Africa Mining plc, 100%)	Muliashi leach plant, Luanshya	40,000 copper cathode.
Do.	First Quantum Mining and Operations Ltd. (First Quantum Minerals Ltd., 100%)	Bwana Mkubwa solvent extraction-electrowinning plant	52,000 copper cathode.
Do.	Kansanshi Mining plc [First Quantum Minerals Ltd., 80%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM—IH), 20%]	Kansanshi smelter, Northwestern Province	340,000 copper cathode.
Do.	Konkola Copper Mines plc [Vedanta Resources plc, 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM—IH), 20.6%]	Nchanga tailings leach plant at Chingola	80,000 copper cathode.
Do.	do.	Nchanga copper smelter, Chingola	311,000 copper anode (blister copper), 3,000 copper-cobalt alloy.
Do.	do.	Nkana copper refinery, Kitwe	300,000 copper cathode.
Do.	Mopani Copper Mines plc [Glencore plc, 73.1%; First Quantum Minerals Ltd., 16.9%; Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM—IH), 10%]	Mufulira West heap-leach facility	NA.
Do.	do.	Mufulira (ISASMELT) smelter	200,000 copper anode.
Do.	do.	Mufulira refinery	275,000 copper cathode.
Do.	do.	Nkana solvent extraction plant, southwest of Kitwe	15,000 copper cathode.
Do.	do.	Nkana cobalt plant, ¹ southwest of Kitwe	2,800 cobalt metal.
Do.	Sable Zinc Kabwe Ltd. (Glencore plc, 100%)	Sable copper leach and electrowinning plant at Kabwe	14,000 copper cathode, 600 cobalt carbonate.

See footnotes at end of table.

TABLE 2—Continued
ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper and cobalt:—Continued				
Metal—Continued		Sino-Metals Leach Zambia Ltd. [China Nonferrous Metals Mining (Group) Co. Ltd., Sino-Africa Mining Investments Ltd., NFC Africa Mining plc, and China Hainan Construction Co. Ltd.]	Chambishi	8,000 copper cathode.
Do.		do.	Mwambashi Mine, Kalulushi, Copperbelt	600,000.
Gemstones:				
Amethyst		Kariba Minerals Ltd. (Gemfields PLC, 50%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM–IH), 50%)	Kariba Mine, Mapatizya area, Kolomo District, Southern Province	1,100.
Beryl and emerald	kilograms	Kagem Mining Ltd. (Hagura Mining Ltd. (Gemfields PLC, 100%), 75%, and Government of Zambia, 25%)	Kagem Mine, Ndola District, Copperbelt Province	6,600.
Tourmaline	do.	Artisanal miners	Various locations	NA.
Gold, Au content of ore	do.	Kansanshi Mining plc [First Quantum Minerals Ltd., 80%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM–IH), 20%]	Kansanshi Mine, north of Solwezi, Northwestern Province	5,300.
Iron and steel, crude steel		Universal Mining and Chemical Industries Ltd. (Trade Kings Group)	Kafue	100,000.
Lead, metal, secondary		Pagrik Zambia Ltd.	Lusaka	1,000.
Lime, quicklime		Ndola Lime Company Ltd. [Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM–IH), 100%]	Ndola	300,000. ²
Do.		Neelkanth Lime Ltd.	NA	144,000. ³
Manganese		Kaboko Mining Ltd.	Mansa area, Luapula Province	120,000.
Do.		Primarily small-scale miners	Mansa area, Luapula Province and Mkushi area, Central Province	120,000.
Nickel, Ni content of ore		Jin Tuo Investments Ltd. (Jinchuan Group International Resources Co. Ltd., 100%)	Munali Mine, ^{1,4} about 60 kilometers south of Lusaka	10,500.
Petroleum, refined	42-gallon barrels	Indeni Petroleum Refinery Ltd. (Government, 100%)	Indeni refinery at Ndola	10,000,000.
Sulfur:				
Pyrite ore, gross weight		Konkola Copper Mines plc [Vedanta Resources plc, 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM–IH), 20.6%]	Nampundwe Mine, ¹ 48 kilometers west of Lusaka	300,000.
Sulfuric acid		do.	Nchanga acid plant	675,000.
Do.		Chambishi Copper Smelter Company, Ltd. [China Nonferrous Metal Mining (Group) Co. Ltd., 60%, and Yunnan Copper Industry (Group) Co. Ltd., 40%]	Chambishi copper smelter, 75 kilometers northwest of Ndola	600,000.
Do.		Kansanshi Mining plc [First Quantum Minerals Ltd., 80%, and Zambia Consolidated Copper Mines Investments Holdings Plc (ZCCM–IH), 20%]	Kansanshi smelter, north of Solwezi, Northwestern Province	1,000,000.

Do., do. Ditto. NA Not available.

¹Operations suspended. Facility on care-and-maintenance status.

²Plant has the capacity to produce up to 5,000 metric tons per year of hydrated lime (slaked) from quicklime.

³Plant has the capacity to produce up to 27,000 metric tons per year of hydrated lime.

⁴Operated by Mabiza Resources Ltd. (Consolidated Nickel Mines Ltd., 100%) through a lease agreement with listed owners.