

2008 Minerals Yearbook

ZAMBIA

THE MINERAL INDUSTRY OF ZAMBIA

By Philip M. Mobbs

Copper mining and refining were the predominant components of Zambia's mineral industry. Zambia also was a significant producer of cobalt and semiprecious gemstones, such as amethyst, beryl, and emerald. In 2008, Zambia's mines accounted for an estimated 9% of total world cobalt output and 4% of world copper production (Edelstein, 2010; Shedd, 2010).

Minerals in the National Economy

In 2008, mining and quarrying accounted for about 8.2% of the real gross domestic product (at constant 1994 prices) compared with 8.5% in 2007. The decline was attributable to the diversification of the economy. According to provisional data, exports of cobalt and refined copper (which may include plate, sheet, strip, and wire) were valued at \$3.4 billion in 2008 and accounted for 70% of Zambia's merchandise exports. Exports of other minerals and mineral-based commodities, such as cement, gemstones, lime, and magnesium, accounted for slightly more than 1% of merchandise exports (Central Statistical Office, 2008a, p. 6; b, p. 6; c, p. 6; d, p. 6-7; e, p. 6; f, p. 6; g, p. 6-7; h, p. 6; i, p. 6-7; j, p. 6-7; 2009a, p. 5; b, p. 7; Bank of Zambia, 2009, p. 35).

Government Policies and Programs

In 2008, significant new legislation concerning the mineral sector was implemented. The mining sector is regulated by Act No. 7 of 2008 [the Mines and Mineral Development Act of 2008], which replaced the Mines and Mineral Act No. 31 of 1995 and amendments. The new mining law calls for a 30% corporate tax on income, a 5% royalty on the gross value of gemstones, a 5% royalty on the "norm" value of precious metals [one of the law's three definitions of the norm value is the monthly average London Metal Exchange (LME) cash price per metric ton multiplied by the quantity of the metal or recoverable metal sold (§133, paragraph 3a-b)], a 3% royalty on the "norm" value of base metals, a 3% royalty on the gross value of industrial minerals, and a variable profit tax of up to 15% on taxable income; the new law also increases the value-added-tax refund period for exploration companies to 7 years. Previously, mining companies with large-scale mining projects had negotiated separate development agreements with the Government that specified fiscal and taxation provisions for the projects. Companies in the mineral industry had been subject to a corporate income tax rate that ranged from 15% to 25%. The old royalty rate had been 2% of the free-on-board market value of produced minerals that was reduced by the cost of handling and transport and the cost of smelting and refining (Government of Zambia, 2008b; Mwale, 2009, p. 13-14).

The new mining law also introduces a controversial windfall tax on value of produced base metals. The windfall tax rate is pegged at 25% when the realized price of copper sold is between about \$5,512 per metric ton (specified as

\$2.50 per pound) and \$6,614 per metric ton (\$3.00 per pound), 50% for copper prices between \$6,614 per metric ton and \$7,716 per metric ton (\$3.50 per pound), and 75% for copper prices that exceed \$7,716 per metric ton. In 2008, the average price of LME grade A copper cathode was \$6,945 per metric ton (\$3.15 per pound) compared with \$7,121 per metric ton (\$3.23 per pound) in 2007. By yearend 2008, the LME price of copper was \$2,902 per metric ton, which was well below the windfall tax threshold. The decline was attributable to the global economic crisis (Government of Zambia, 2008b; Edelstein, 2010).

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. Act No. 2 of 2008 [the Customs and Exercise Act (amendment) of 2008] introduces a 15% export duty on the value of cement copper, copper ores and concentrates, and copper anodes. For exported ferrous scrap, a 25% levy is due on the value per kilogram [or 80,000 kwacha (about \$21) per kilogram, whichever is greater]. For aluminum scrap, copper scrap, and zinc scrap, a 25% levy is charged on the value per metric ton [or 1,000,000 kwacha (about \$262) per metric ton, whichever is greater] (Government of Zambia, 2008a).

The Environmental Protection and Pollution Control Act of 1990 and its 1999 amendment address environmental issues, including those associated with the mining industry. Petroleum exploration and production are regulated by Act No. 10 of 2008 [the Petroleum (Exploration and Production) Act of 2008], which replaced Petroleum (Exploration and Production) Act No. 13 of 1985 and amendments.

In mid-2008, the Government resumed issuing mining exploration licenses. The issuance of licenses had been suspended in 2007 owing to the introduction of a digitized and reorganized cadastre system that detailed the location, ownership, and tenure of licensed mineral exploration and mining activities.

Production

The increase in production of copper sulfide ore at First Quantum Minerals Ltd. of Canada's Kansanshi Mine resulted in a notable increase in copper concentrate and increased gold and silver doré. Production of refined cobalt, however, decreased significantly in 2008. Data on Zambian mineral production are in table 1.

Structure of the Mineral Industry

Many of the country's large mining operations are located in Copperbelt Province in north-central Zambia. The Government retains minority interest in most of the large copper projects through its Zambia Consolidated Copper Mines Investments Holdings Plc. The mining sector is administered by the

Geological Survey Dept., the Mines Development Dept., and the Mines Safety Dept. of the Ministry of Mines and Minerals Development. The Ministry of Commerce, Trade and Industry oversees the industrial manufacturing sector. Copperbelt Energy Corporation Plc, which purchased most of its power from state-owned ZESCO Ltd., distributed electrical power to many of the larger mining operations.

In 2008, Vedanta Resources plc of the United Kingdom acquired Zambia Copper Investments Ltd.'s 28.4% interest in Konkola Copper Mines plc, which brought Vedanta's interest in Konkola to 79.4%. Data on the capacity and ownership of selected mineral operations are in table 2.

Commodity Review

In January, a national failure of the electricity power grid adversely affected the mines and mineral processing facilities in Zambia. Some miners initially were trapped underground owing to the lack of electricity to power the mine winders, which also stopped the lifting of ore to the surface. Failure to power ventilation fans adversely affected the underground working environment. Also, other electricity-powered equipment, such as pumps, were damaged, which resulted in partial flooding of some mines. Most mines, however, resumed normal activity within 2 to 3 weeks (Shacinda, 2008b).

A number of exploration projects for cobalt, copper, gold, and uranium continued in 2008. Companies with exploration projects in Zambia included Africa Eagle Resources plc of the United Kingdom on the Sasare Eagle Eye copper gold prospect and the Lunga copper, gold, and uranium prospect. In 2008, Phelps Dodge Mining Ltd. of the United States withdrew from the Ndola copper prospect joint venture with African Eagle. African Eagle increased its interest in the Mokambo copper prospect joint venture to 87% when partner Copperbelt Minerals Ltd. of the United Kingdom reduced its interest to 13% from 50%. CGA Mining Ltd. of Australia completed a prefeasibility study on the Mkushi copper prospect. Joint-venture partner African Eagle and CGA subsequently decided to postpone the decision to develop the project owing to the decline in copper prices and global market conditions (African Eagle Resources plc, 2009).

Companies with exploration activity also included African Energy Resources Pty. Ltd. and Albidon Ltd. of Australia on the Chirundu joint-venture uranium project; African Energy also agreed to an option to acquire 51% interest in Aldershot Resources Ltd.'s Kariba uranium project; Allied Energy Corp. of the United States evaluated the Starfield tin mine; the joint venture of the BHP Billiton Group and Blackthorn Resources Ltd. of Australia (formerly AIM Resources Ltd.) explored the Mumbwa copper and gold project; and Caledonia Mining Corp. of Canada explored the Nama cobalt project. Based on the results of a National Instrument 43-101 technical report, ICS Copper Systems Ltd. of Canada abandoned the option that it held on its Mokambo copper project, which was located in the central Mokambo area (ICS Copper Systems Ltd., 2009, p. 2).

Other exploration activity included the following: Kiwara PLC of the United Kingdom evaluated the Kawanga uranium and the Kwako nickel prospects; the joint venture of Kiwara and

LM Engineering Ltd. worked cobalt-copper-nickel prospects and an iron ore deposit on the Kalumbila prospect; Luiri Gold Ltd. of Canada drilled the Luiri Hills gold project (which included the Dunrobin and the Matala Dome deposits); and OmegaCorp Minerals Ltd. of Australia, which was a subsidiary of Denison Mines Corp. of Canada, drilled the Mutanga uranium project. Because of the Government's suspension of new exploration licenses, Red Rock Resources plc of the United Kingdom deferred work on the Chiwefwe manganese prospect in 2008.

In 2008, Teal Exploration & Mining Inc. of Canada [in which African Rainbow Minerals Ltd. of South Africa (ARM) held 65% interest] acquired the 30% joint-venture interest in the Mwamabashi copper project that was formerly held by Korea Zinc Company Ltd. Teal continued its evaluation of the Konkola North copper project and formed a joint venture with Antofagasta Minerals SA to evaluate exploration areas 2 and 4. At yearend, ARM proposed to acquire 100% of Teal's shares and to form a joint venture with Companhia Vale do Rio Doce S.A. to explore in the Democratic Republic of the Congo [Congo (Kinshasa)], Namibia, and Zambia.

Zambezi Resources Ltd. of Bermuda explored the Kangaluwi copper project. Zambezi evaluated the Cheowa copper project joint venture with Glencore International AG of Switzerland and the Mpande and the Oryx uranium prospects with joint-venture partner Lithic Metals and Energy Ltd. In November, Zambezi agreed with creditors to a 4-month suspension of operations in order to restructure the company's finances (Zambezi Resources Ltd., 2008).

Metals

Cobalt.—Chambishi Metals Plc suspended operations at the Chambishi cobalt smelter in early December. Chambishi Metals, which was a sister company of Luanshya Copper Mines Ltd., cited the decline in metal prices as a contributing factor for the closure (Shacinda, 2008a; Zambian Chronicle, 2009).

Copper.—In 2008, First Quantum commissioned the sulfide-ore-treatment-capacity-expansion project at the Kansanshi Mine, which increased the mine's sulfide ore throughput to more than 12 million metric tons per year (Mt/yr) from a capacity of 8 Mt/yr. The Kansanshi Mine was also able to process 6 Mt/yr of oxide ore. In 2008, 19.1 million metric tons (Mt) of ore and 28.7 Mt of waste were mined at Kansanshi compared with 15.5 Mt of ore and 24.9 Mt of waste in 2007. The Kansanshi solvent extraction-electrowinning (SX-EW) plant produced 102,353 metric tons (t) of copper cathode in 2008 compared with 93,249 t in 2007 (First Quantum Minerals Ltd., 2009, p. 4, 22).

The Bwana Mkubwa SX-EW plant posted a 77% decrease in output to 5,851 t of copper cathode in 2008 from 25,402 t in 2007. Bwana Mkubwa, which had processed copper ore from First Quantum's Lonshi Mine in Congo (Kinshasa) until the border was closed to shipments of copper ore in November 2007, was placed on care-and-maintenance status in October 2008. The Lonshi Mine continued to operate until August 2008, when the mine was closed because of the exhaustion of ore reserves; the ore mined from November 2007 until August 2008 remained stockpiled in Congo (Kinshasa) (First Quantum Minerals Ltd., 2009, p. 5, 9, 24).

Konkola Copper Mines plc produced 132,000 t of copper cathode in 2008 compared with 153,000 t in 2007. The January national electrical power failure, lower copper prices, and the diverting of copper concentrate to the new Nchanga smelter (as it was ramped up to capacity) from the old Nchanga smelter contributed to the decline in copper production. Work continued on the Konkola deeps mining project; initial production was postponed until early 2010 (Vedanta Resources plc, 2008; 2009, p. 3).

In November, because of the decline in copper prices, LCM suspended the development of the Mulyashi Mine, which had been expected to start production in early 2009. In late December, LCM placed the Baluba copper mine on care-and-maintenance status and Chambishi Metals Plc suspended operations at the Chambishi copper roaster (Shacinda, 2008a).

In July, a fire damaged the main electrical transformer and substation, which delayed the commissioning of the Lumwana Mine that was operated by Equinox Minerals Ltd. of Australia. Contractors completed the Lumwana processing facilities in November, and in December, Equinox produced its initial concentrate. Equinox expected to ramp the project up to full capacity (20 Mt/yr of ore from which concentrate containing 172,000 t of copper would be produced) by mid-2009 (Equinox Minerals Ltd., 2009, p. 11-12).

Nickel.—In early 2008, Albidon Ltd. of Australia began mining at the Munali nickel mine, which was located about 60 kilometers (km) south of Lusaka. At midyear, Albidon started producing a nickel concentrate that also contained cobalt, copper, and platinum-group metals. By yearend, the company had mined 270,376 t of ore to produce 10,911 t of concentrate that had an average grade of 6.88% nickel (about 751 t of nickel contained in the concentrate). Mine output had been adversely affected by the problems with underground mining equipment and delays in the receipt of replacement parts (Albidon Ltd., 2009, p. 1).

Industrial Minerals

Cement.—Chilanga Cement plc, which was a subsidiary of Lafarge S.A. of France, inaugurated a new cement plant. The 830,000-metric-ton-per-year-capacity plant was located about 15 km south of Lusaka, adjacent to the older plant at Chilanga (Lafarge S.A., 2008).

Sinoma International Engineering Co. Ltd. of China was contracted to build a cement plant in Zambia for the Dangote Group of Nigeria. The proposed 3,000-metric-ton-per-day-capacity plant was to be located near Lusaka (Ahemba, 2008; China Knowledge, 2009).

Outlook

Zambia has many deposits and occurrences of metals; historically, the country's mining industry has been dominated by the copper sector. Landlocked Zambia faces several internal and external obstacles to successful and sustained mineral resource development; these include cyclical world commodity prices; high transportation costs; limited national infrastructure, particularly west of the Copperbelt; the cost of imported

equipment and supplies; potential disruptions of electrical energy and fuel supplies, and the threat that high HIV/AIDS rates in the region pose to maintaining a skilled labor force.

The surge in international mineral prices during the past few years has increased investor interest in exploration for and development of economic deposits of metal, such as cobalt, copper, gold, manganese, nickel, and zinc; industrial minerals and mineral-related commodities, especially cement, semiprecious gemstones, and sulfuric acid; and mineral fuels and related materials, such as petroleum and uranium. The dramatic decline in international mineral prices (especially copper and nickel) in late 2008, compounded by the effects of the newly-introduced increase in taxes (especially the windfall tax), is expected to adversely affect the short-term economic viability of Zambia's mineral industry.

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${\it TABLE~1}$ ZAMBIA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES $^{1,\,2}$

(Metric tons unless otherwise specified)

Commodity	2004	2005	2006	2007	2008
METALS					
Cobalt:					
Mine output, Co content	10,000	9,300	8,000	7,500 ^r	6,900
Metal, Co content	5,791 ³	5,422 3	4,665 3	4,335 ^{r, 3}	2,591
Copper: ⁴	ŕ	,	ŕ	ŕ	
Mine output, Cu content:					
By concentration or cementation	344,300 ³	341,000	370,000	340,000 ^r	383,000
Leaching, electrowon	82,600 ³	106,000	144,000	216,000 r	200,000
Total	426,900 3	447,000	514,000	556,000 r	583,000
Metal:					
Smelter, primary, includes low-grade electrowon	$280,100^{-3}$	270,000	290,000	224,000 ^r	230,000
Refinery, primary:	•	•	•	•	
Electrowon	124,000	155,000	178,000	160,000 ^r	163,000
Other	286,000	244,000	240,000	230,000 ^r	240,000
Total	410,000	399,000	418,000	390,000 ^r	400,000
Gold kilograms	, 	440	956	1,270	1,930
Lead, metal, secondary	1,000	1,000	1,000	1,000	1,000
Manganese:	,	,	,	,	,
Gross weight				1,400	1,500
Mn content				644	700
Silver kilograms		2,000	3,000 ^r	3,500 ^r	4,000
INDUSTRIAL MINERALS		,	,	,	,
Cement	390.000	435,000	650,000	650,000	700,000
Clays:	,	,	,	,	,
Brick	3,300	3,300	3,300	3,300	3,300
Building, not further specified	33,000	33,000	33,000	33,000	33,000
China and ball	200	200	200	200	200
Gemstones:					
Amethyst kilograms	1,100,000	1,100,000	1,200,000	1,200,000	1,100,000
Beryl do.	8,000	10,000	10,000	10,000	9,200
Emerald do.	2,100	2,500	2,600	2,500	2,300
Tourmaline do.	26,000	26,000	27,000	27,000	25,000
Lime, calcined thousand metric tons	150	150	150	150	150
Limestone:					
For cement and lime do.	750	750	1,200	1,200	1,300
Crushed aggregate do.	650	650	700	700	700
Sand and gravel, construction do.	220	220	300	300	300
Sulfur:					
Gross weight:					
Pyrite concentrate	280,000	285,000	290,000	290,000	290,000
Sulfuric acid ⁵	12,000	12,000	15,000	15,000	15,000
Sulfur content:	,	,	-,	.,	-,
Pyrite concentrate (42% S)	118,000	120,000	122,000	123,000	123,000
Sulfuric acid (32.6% S)	3,910	3,910	4,890	4,900	4,900
Total, S content	122,000	124,000	127,000	128,000	128,000
MINERAL FUELS AND RELATED MATERIALS	122,000	12.,000	127,000	120,000	120,000
Coal, bituminous	240,000	240,000	210,000	220,000	220,000
Petroleum, refinery products thousand 42-gallon barrels	6,200	5,000	5,000	4,400	4,500
In the Pine 7	5,200	2,000	2,000	1,700	7,500

Revised. do. Ditto. -- Zero.

¹Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Table includes data available through February 4, 2010.

³Reported figure.

⁴Terms used are as defined by the International Copper Study Group.

⁵From the Chambishi and the Nkana acid recovery plants.

$\label{eq:table 2} \textbf{ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2008}$

(Metric tons unless otherwise specified)

	Major operating companies		Annual	
Commodity	and major equity owners	Location of main facilities	capacity	
Cement	Chilanga Cement plc (Lafarge S.A., 84%)	Lusaka and Ndola plants	700,000.	
Do.	do.	New plant at Lusaka	830,000.	
Do.	Zambezi Portland Cement Ltd.	Ndola	330,000.1	
Coal, bituminous	Maamba Collieries Ltd. (Government, 100%)	350 kilometers south of Lusaka in the Kanzie and the Izuma Basins	800,000.	
Do.	Collum Coal Mining Industries Ltd.	Near Sinazongwe	200,000.	
Copper and cobalt:				
Ore and concentrate	Lumwana Mining Company Ltd. (Equinox Minerals Ltd., 100%)	Lumwana Mine (Malundwe pit)	20,000,000 ore.	
Do.	Kansanshi Mining plc (Kansanshi Holdings Ltd., ² 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 20.6%)	Kansanshi Mine, north of Solwezi	12,000,000 sulfide ore, 6,000,000 oxide ore.	
Do.	Konkola Copper Mines plc (Vedanta Resources plc., 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 20.6%)	Nchanga open pit	4,500,000 ore.	
Do.	do.	Nchanga underground mine	2,800,000 ore.	
Do.	do.	Konkola Mine, Chililabombwe	2,400,000 ore.	
Do.	do.	Fitwaola open pit	NA.	
Do.	Mopani Copper Mines plc (Carlisa Investments Corp., ³ 90%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 10%)	Nkana Mine	5,500,000 ore.	
Do.	do.	Mufulira Mine	2,500,000 ore.	
Do.	Luanshya Copper Mines Ltd. (Enya Holdings BV, ⁴ 85%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 15%)	Baluba underground mine	1,400,000 ore. ⁵	
Do.	NFC Africa Mining plc (China Nonferrous Metal Mining Corp., 85%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 15%)	Chambishi Mine	800,000 ore, which yields about 50,000 copper in concentrate.	
Do.	Chibuluma Mines plc (Metorex Ltd., 65%, and Industrial Development Corp. of South Africa Ltd., 35%)	Chibuluma South Mine, about 20 kilometers from Kitwe	600,000 ore, which yields about 14,000 copper in concentrate. ⁶	
Do.	Albidon Ltd.	Munali nickel mine, about 60 kilometers south of Lusaka	1,200,000 ore, which yields about 1,700 copper and 500 cobalt coproduct.	
Metal	Konkola Copper Mines plc (Vedanta Resources plc., 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 20.6%)	Tailings leach plant at Chingola	80,000 copper cathode.	
Do.	KCM (Smelterco) Ltd. (Vedanta Resources plc., 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 20.6%)	Nchanga copper smelter	500,000 copper anode (blister copper).	
Do.	do.	Nkana copper smelter	240,000 copper anode (blister copper).	
Do.	do.	Nkana copper refinery	180,000 copper cathode.	
Do.	Mopani Copper Mines plc (Carlisa Investments Corp., 3 90%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 10%)	Mufulira in situ leach and SX-EW ⁷ plant	17,000 copper cathode.	
Do.	do.	Mufulira (ISASMELT) smelter ⁸	200,000 copper anode.	
Do.	do.	Mufulira refinery	275,000 copper cathode.	
Do.	do.	Nkana heap leach	38,000 copper cathode.	
Do.	do.	Nkana cobalt refinery	2,500 cobalt metal.	

See footnotes at end of table.

TABLE 2—Continued ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2008

(Metric tons unless otherwise specified)

	Major operating companies		Annual
Commodity	and major equity owners	Location of main facilities	capacity
Copper and cobalt—Continued			
Metal—Continued	Chambishi Metals plc (Enya Holdings BV, 4 90%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 10%)	Chambishi cobalt plant and Nkana slag dump	27,000 copper cathode, 7,000 cobalt metal. ⁵
Do.	First Quantum Minerals Ltd.	Bwana Mkubwa SX-EW ⁶ plant, which treats ore from the Lonshi Mine, Congo (Kinshasa)	52,000 copper cathode.
Do.	Sable Zinc Kabwe Ltd. (Metorex Ltd., 100%)	Sable copper leach and electrowinning plant at Kabwe treats feed imported from concentrates produced from the Ruashi stockpiles, Congo (Kinshasa)	14,000 copper cathode, 300 cobalt carbonate.
Do.	Sino-Metals Leach Zambia Ltd. (China Nonferrous Metals Mining Co. Ltd., Sino-Africa Mining Investments Ltd., NFC Africa Mining Plc, and China Hainan Construction Co. Ltd.)	Chambishi	8,000 copper cathode.
Do.	Triple Plate Junction Smelting Ltd. (Triple Plate Junction Plc, 90%)	Ndola copper smelter	800 copper anode.
Gold, content of ore kilograms	Kansanshi Mining plc (Kansanshi Holdings Ltd., ² 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 20.6%)	Kansanshi Mine	1,000.
Lime, quicklime	Ndola Lime Company Ltd. (Zambia Consolidated Copper Mines Investment Holdings Plc, 100%)	Ndola	300,000.9
Lead, metal, secondary	Pagrik Zambia Ltd. (Gravita Group, 100%)	Lusaka	1,000.
Manganese	Small-scale miners	Luapula	250.
Nickel, Ni content of ore	Albidon Ltd.	Munali Mine, about 60 kilometers south of Lusaka	10,500.
Petroleum, refined 42-gallon barrels	Indeni Petroleum Refinery Ltd. (Total Outre Mer, 50%, and Government, 50%)	Indeni refinery at Ndola	3,500,000.
Sulfur:			
Pyrite ore, gross weight	Konkola Copper Mines Plc	Nampundwe Mine, 48 kilometers west of Lusaka	300,000.
Sulfuric acid	do.	Nkana No. 3 and No. 4 acid plants	380,000.
Do.	do.	Nchanga acid plant	180,000.
Do.	First Quantum Minerals Ltd.	Bwana Mkubwa acid plant	350,000.

Do., do. Ditto. NA Not available.

¹Under construction.

²Subsidiary of First Quantum Minerals Ltd.

³Carlisa Investments Corp. is owned by Glencore International AG, 81.2%, and First Quantum Minerals Ltd., 18.8%.

⁴Enya Holdings BV is owned by International Mineral Resources AG and Beny Steinmetz Group Resources.

⁵Suspended.

⁶Also includes some cobalt content.

⁷Solvent extraction-electrowinning.

⁸Construction of the ISASMELT smelter that had a copper-in-concentrate input capacity of 720,000 metric tons per year (t/yr) was completed at Mufulira, and commissioning began in late 2006. The ISASMELT smelter replaced the old smelter at Mufulira that had an input capacity of 420,000 t/yr copper concentrate and an output capacity of 160,000 t/yr of copper anode.

⁹Plant has the capacity to produce up to 5,000 metric tons of hydrated lime (slaked) from quicklime.