



2010 Minerals Yearbook

ZAMBIA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF ZAMBIA

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Copper mining and refining were the predominant components of Zambia's mineral industry. Zambia also was an internationally significant producer of cobalt and semiprecious gemstones (Edelstein, 2011; Shedd, 2011).

Minerals in the National Economy

In 2010, the mining and quarrying sector accounted for 9.9% of Zambia's real gross domestic product (GDP) (at constant 1994 prices) compared with a revised 9.3% in 2009. The country's real GDP increased by 7.6% in 2010; mining and quarrying accounted for 18% of the increase (Bank of Zambia, 2011, p. 32–33, 35).

Copper exports accounted for 78% of Zambia's merchandise exports in 2010. The value of exported copper was estimated to be about \$5.8 billion. The value of exports of cobalt was estimated to be \$304 million, which accounted for 4% of Zambia's exports (Bank of Zambia, 2011, p. 23). The value of imports of oil was estimated to be about \$618 million in 2010; Oil accounted for 13% of Zambia's imports (International Monetary Fund, 2011, p. 20).

Government Policies and Programs

The mining sector is regulated primarily by Act No. 7 of 2008 (the Mines and Mineral Development Act of 2008). Uranium exploration and mining are regulated by the Mines and Minerals Development (Prospecting, Mining and Milling of Uranium Ores and Other Radioactive Mineral Ores) Regulations of 2008.

The Income Tax Act (Chapter 323 of the Laws of Zambia) and recent changes, such as the Income Tax (Amendment) Act of 2008 and Income Tax (Amendment) Act no. 27 of 2009, and the Mines and Minerals Development Act of 2008, address capital allowances, mineral royalties, mining development agreements, the variable profits tax, and the windfall tax. 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. 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].

Production

Data on Zambian mineral production are in table 1. Notable increases in production were estimated for cobalt ore, copper (anode, cathode, and ore), gold, limestone, manganese ore, nickel ore, and sulfuric acid. Production of cobalt metal was estimated, and production of emerald was reported to have decreased significantly in 2010.

Structure of the Mineral Industry

Many of the country's large copper mining and processing operations are 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. 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.

Much of the mineral industry's electrical power is distributed by Copperbelt Energy Corporation Plc, which was owned by Zambian Energy Corporation Ltd. of Ireland (52% equity) and ZCCM Investments Holdings PLC of Zambia (20%). Copperbelt Energy purchased 99.98% of its power from ZESCO Ltd., which was a Government parastatal company, but also had 80 megawatts (MW) of gas-turbine-powered generating capacity. ZESCO's 1,842 MW of generating capacity was powered by its hydroelectric facilities. ZESCO also operated several small isolated diesel-fueled power stations (Copperbelt Energy Corporation Plc, 2011, p. 16–17, 37; ZESCO Ltd., undated).

In the past few years, domestic electrical power demand has exceeded domestic supply, which has adversely affected several proposed high-energy-demand mineral-processing projects in Zambia. Copperbelt Energy joined the Southern African Power Pool in 2009, and ZESCO expected to add 360 MW of electricity-generating capacity in 2013, another 120 MW of capacity in 2015, and an additional 750 MW of generating capacity by 2017. All the generating capacity additions would come from hydroelectric facilities (ZESCO Ltd., undated).

In 2010, Eurasian Natural Resources Corporation PLC (ENRC) of Kazakhstan acquired Enya Holdings BV, which held 90% equity interest in Chambishi Metals plc. In January, First Quantum Minerals Ltd. of Canada completed the acquisition of Kiwara Plc of the United Kingdom, which owned 85% of Kalumbila Minerals Ltd. of Zambia. By November, First Quantum had acquired the remaining 15% equity interest in Kalumbila from LM Engineering of Zambia. Kalumbila's exploration prospects were renamed the Trident project. Data on the capacity and ownership of selected mineral operations are in table 2.

Commodity Review

Metals

Cobalt and Copper.—CNMC Luanshya Copper Mines Ltd. suspended production operations at the Baluba underground copper mine in November in order to rehabilitate the hoisting

system. CNMC Luanshya continued mining operations; ore was stockpiled underground. Ore hoisting was scheduled to resume in January 2011. CNMC Luanshya also resumed work at the Mulyashi open pit mine. Initial production [at the rate of 60,000 metric tons per year (t/yr) of copper ore] from several pits at the mine site was expected to begin in December 2011 or January 2012 (Sinkamba, 2010; Thomson Reuters, 2010).

ENRC started construction of an \$80 million copper solvent extraction-electrowinning (SX/EW) plant, which was expected to increase the Chambishi facility's copper cathode production capacity to 55,000 t/yr by 2012. The expansion project also was expected to increase the quality of the plant's copper output to Grade A (high grade) from standard electrolytic grade (Eurasian Natural Resources Corporation PLC, 2011, p. 47).

After the acquisition of majority interest in Chambishi Metals in April, ENRC restarted the Chambishi's facility's cobalt leaching, purification, and electrowinning facilities. By yearend, Chambishi Metals had produced 3,300 metric tons (t) of cobalt metal primarily from imported ores (Eurasian Natural Resources Corporation PLC, 2011, p. 35).

In 2010, First Quantum mined 23 million metric tons (Mt) of ore from the Main and the Northwest pits at the Kansanshi Mine compared with a revised 18.7 Mt of ore mined in 2009. The Kansanshi SX-EW plant produced 184,182 t of copper cathode in 2010, of which 47% was recovered from ore produced by First Quantum. Kansanshi also produced 46,941 t of copper in concentrate and 3,400 kilograms (kg) of gold. A project to expand Kansanshi's copper production capacity was underway. Phase I, which was expected to increase the treatment capacity of the copper oxide ore circuit to 7.2 million metric tons per year (Mt/yr) from 4 Mt/yr, was expected to be completed in 2011. Phase 2, which was expected to increase the treatment capacity of the copper oxide ore circuit to 12 Mt/yr, was scheduled to be completed in 2012. Phase 3, which included the installation of a new 25-Mt/yr-capacity concentrator, was scheduled to be completed in 2014. As a result of the expansion projects, Kansanshi's copper production capacity was expected to be increased to 400,000 t/yr by 2015 from 250,000 t/yr in 2010 (First Quantum Minerals Ltd., 2011a, p. 15–16; 2011b, p. 38).

In 2010, the throughput capacity of the Kansanshi gold recovery facilities was increased by more than 35%. The installation of a gravity-based gold concentration unit to treat residues from the Kansanshi plant's high-pressure leach circuit was expected to be completed by midyear 2011 (First Quantum Minerals Ltd., 2011a, p. 15).

First Quantum's Bwana Mkubwa SX-EW plant, which had been on care-and-maintenance status since October 2008, reopened in January 2010. The plant, which processed copper ore from First Quantum's Lonshi Mine in Congo (Kinshasa), was returned to care-and-maintenance status in October after First Quantum shipped its permitted allocation of ore from Congo (Kinshasa). Bwana Mkubwa produced 7,415 t of copper cathode in 2010 (First Quantum Minerals Ltd., 2011a, p. 22).

With the completion of the expansion of the Nkana copper refinery to 300,000 t/yr from 180,000 t/yr, Konkola Copper Mines plc (KCM) produced 222,000 t of copper cathode in 2010 compared with 155,000 t in 2009. Of KCM's total cathode output, 60% was derived from Konkola's ores

(Vedanta Resources plc, 2010b; 2011b; London Stock Exchange Group plc, 2011, p. 57).

KCM continued work on the Konkola Deep Mine project, which was to extend the mine capacity and the expected mine life. In 2010, KCM initiated the installation of the 7.5-Mt/yr-capacity Nchanga East concentrator and the 3-Mt/yr-capacity Nchanga West concentrator. KCM also ordered a third electric furnace for the Nchanga copper smelter at Chingola. Installation of emergency power generators with a total of 24 MW of electricity-generating capacity was expected to be completed in 2011. Also underway was the development of the upper ore body at the Nchanga underground mine; the evaluation of the Chingola refractory ore (CRO) project (a 50,000-t/yr-capacity operation that was expected to reprocess 150,000 t of refractory ore tailings that had an average grade of 0.9% copper); and the evaluation of the installation of a second cobalt furnace (Outotec OYJ, 2010; Vedanta Resources plc, 2010a, p. 43–44; 2011a, p. 40–41).

Konnoco Zambia Ltd. initiated construction of the 2.5-Mt/yr-capacity Konkola North copper mine. The proposed mine was expected to produce 45,000 t/yr of copper in concentrate. Konnoco Zambia Ltd. was a joint venture of African Rainbow Minerals Ltd. of South Africa and Vale Ltd. of Brazil (African Rainbow Minerals Ltd., 2010).

Lumwana Mining Company Ltd., which was a subsidiary of Equinox Minerals Ltd. of Canada, mined 17.58 Mt of ore in 2010 and processed 18.58 Mt of ore to produce 354,256 t of copper concentrate that contained 146,690 t of copper compared with processing 13.69 Mt of ore to produce 253,917 t of copper concentrate that contained 109,413 t of copper in 2009. Lumwana started a debottlenecking and optimization program at the processing plant that was expected to increase copper ore throughput capacity to 25 Mt/yr by yearend 2011 from 20 Mt/yr. Development of the Chimiwungo open pit and crushing plant started in 2010. Initial ore production from Chimiwungo was expected by yearend 2012 (Equinox Minerals Ltd., 2011, p. 17–18, 21).

Metorex Ltd. installed additional electricity-generating facilities at the underground Chibuluma copper mine in 2010. The \$1 million expansion of electricity-generating capacity was expected to address the effect of erratic electrical power supply that had affected the mining and milling operations previously. Copper sulfide ore was concentrated to a grade of 45% to 50% copper, and the concentrate was shipped to the Chambishi copper smelter. In 2010, Metorex milled 571,000 t of copper ore to produce 17,729 t of copper in concentrate. Metorex initiated a resource replacement exploration program in 2010. Metorex's Sable Zinc Kabwe Ltd. produced 4,050 t of copper cathode and 42 t of cobalt carbonate from purchased ore (Metorex Ltd., 2011, p. 39–41).

In 2010, Mopani Copper Mines Plc produced about 197,000 t of copper cathode and 1,100 t of cobalt from the Mufulira and the Nkana copper mines. Mopani was expanding the input capacity of the Mufulira smelter to 870,000 t/yr of copper concentrate from 650,000 t/yr, which was expected to increase the smelter's copper anode output to about 260,000 t/yr from 200,000 t/yr (First Quantum Minerals Ltd., 2011a, p. 6; Glencore International plc, undated).

NFC Africa Mining plc started production from the West ore body at the Chambishi Mine in November. Production from the West ore body was expected to increase the Chambishi Mines' copper ore output by 1 Mt/yr (China Daily, 2010).

Manganese.—Manganese ore primarily was produced primarily by small-scale operations near Mansa in Luapula Province and Mkushi in Central Province. The joint venture of Genesis Procurement Ltd. and Luapula Base Metals Ltd. increased output to about 60,000 t/yr of ore from three mines in the Mansa area. Other international companies involved in manganese ore production included Ore and Steel Feed Industries, which was a subsidiary of Contrarian Investment Holdings (Proprietary) Ltd. of South Africa, and Peniel Mines, which was a subsidiary of MGR Commodities and Gems of South Africa. International companies exploring for manganese included African Asian Mining Development Ltd. of South Africa, the joint venture of Allegra Mining (which was a subsidiary of Ethan Minerals Ltd. of Australia) and Eagle Eye Mining Ltd. of Zambia), a subsidiary of Parrogate of India, and Tycoon Mining Investments of China. Red Rock Resources plc of the United Kingdom's manganese license in the Chiwewe area continued to be occupied by illegal miners despite the granting of an injunction by the Government (Global Times, 2010).

Nickel.—In January, operations at the Munali nickel mine and mill resumed after being on care-and-maintenance status in 2009. Albidon Zambia Ltd., which was a subsidiary of Albidon Ltd. of Australia, mined 701,303 t of ore at Munali from which 33,478 t of nickel concentrate was produced. All the concentrate, which contained 2,809 t of nickel, was sold to the Jinchuan Group Ltd. of China (Albidon Ltd., 2011, p. 3, 6–9).

Outlook

In the near term, the Zambian mineral industry is expected to continue to recover from the disruptions that were caused by the dramatic decline in international mineral prices (especially copper and nickel) that was associated with the global economic crisis in late 2008 and early 2009. Announced expansions of copper mine output capacities would allow annual copper production to reach 1 Mt/yr when all the projects reach their full proposed production levels. Historically, the country's mining industry has been dominated by the copper sector, although Zambia has many deposits and occurrences of other metals. Current exploration of manganese, nickel, and uranium occurrences could lead to additional development of Zambia's mineral resources. Landlocked Zambia faces several internal and external obstacles to successful diversification of its mineral resources, however; these include the availability of electrical energy and fuel supplies, cyclical world commodity prices, high transportation costs, limited national infrastructure, and the threat that high HIV/AIDS rates in the region pose to maintaining a skilled labor force.

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TABLE 1
ZAMBIA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2006	2007	2008	2009	2010
METALS					
Cobalt:					
Mine output, Co content	8,000	7,500	7,000 ^r	4,900 ^r	5,700
Metal, Co content	4,665 ⁴	4,335 ⁴	4,049 ^{r,4}	1,271 ^{r,4}	1,092 ⁴
Copper:⁵					
Mine output, Cu content:					
By concentration or cementation	350,000 ^r	341,000 ^r	392,000 ^r	554,000 ^r	670,000
Leaching, electrowon	124,000	168,000	163,000	140,000 ^r	150,000
Total	474,000 ^r	509,000 ^r	555,000 ^r	694,000 ^r	820,000
Metal, smelter, primary, includes low-grade electrowon	290,000	224,000	232,000	330,000	490,000
Refinery, primary:					
Electrowon	178,000	200,000	175,000	145,000 ^r	160,000
Other	240,000	230,000	267,000 ^r	290,000 ^r	370,000
Total	418,000	430,000	442,000 ^r	435,000 ^r	530,000
Gold kilograms	956	1,270	1,930	3,100	3,400
Iron and steel, crude steel	--	--	--	10,000	40,000
Lead, metal, secondary	1,000	1,000	1,000	1,000	1,000
Manganese:					
Gross weight	--	2,000 ^r	55,000 ^r	40,000 ^r	120,000
Mn content	--	644	17,000 ^r	13,000 ^r	40,000
Nickel, Ni content of concentrates	--	--	750	280	2,809 ⁴
Silver kilograms	3,000	3,500	4,000	6,000	6,500
INDUSTRIAL MINERALS					
Cement	550,000	540,000	560,000	880,000	1,126,728 ⁴
Clays:					
Brick	3,300	3,300	3,000	3,000	3,100
Building, not further specified	33,000	33,000	30,000	30,000	31,000
China and ball	200	200	200	200	200
Gemstones:					
Amethyst kilograms	1,500,000	1,300,000	900,000	1,400,000	1,300,000
Beryl do.	5,000	5,000	4,000	6,000	5,500
Emerald do.	2,100	2,100	1,600	37,850 ^{r,4}	21,086 ⁴
Tourmaline do.	27,000	25,000	15,000	21,000	20,000
Lime, calcined thousand metric tons	160	165	135	130	140
Limestone:					
For cement and lime do.	1,200	1,200	1,300	2,000	2,600
Crushed aggregate do.	700	700	700	750	800
Sand and gravel, construction do.	300	300	300	320	350
Sulfur:					
Gross weight:					
Pyrite concentrate	290,000	290,000	290,000	100,000	--
Sulfuric acid ⁶	15,000	15,000	40,000 ^r	600,000 ^r	990,000
Sulfur content:					
Pyrite concentrate (42% S)	122,000	123,000	123,000	42,000	--
Sulfuric acid (32.6% S)	4,890	4,900	17,000 ^r	200,000 ^r	300,000
Total, S content	127,000	128,000	140,000 ^r	240,000 ^r	300,000
MINERAL FUELS AND RELATED MATERIALS					
Coal, bituminous	210,000	220,000	220,000	200,000	200,000
Petroleum, refinery products thousand 42-gallon barrels	5,000	4,400	4,500	4,500	4,500

^rRevised. do. Ditto. -- Zero.

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

²Table includes data available through January 9, 2012.

³In addition to the commodities listed, palladium, platinum, and selenium may be produced, but information is inadequate to estimate output.

⁴Reported figure.

⁵Terms used are as defined by the International Copper Study Group.

⁶From the Chambishi and the Nkana acid recovery plants.

TABLE 2
ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Lafarge Cement Zambia plc (Pan African Cement Ltd., ¹ 50%, and Financiere Lafarge S.A., ¹ 34%)	Chilanga II plant, about 15 kilometers south of Lusaka	830,000.
Do.	do.	Ndola plant	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	330,000.
Coal, bituminous	Maamba Collieries Ltd. (Nava Bharat consortium, 65%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 35%)	350 kilometers south of Lusaka in the Kanzie and the Izuma Basins	NA.
Do.	Collum Coal Mining Industries Ltd.	Near Sinazongwe	240,000.
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%)	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. ³
Do.	do.	Reprocessing material from the TD3a, the TD3b, the TD5, and the TD7 tailings dams, Chingola	NA.
Do.	Mopani Copper Mines plc (Carlisa Investments Corp., ⁴ 90%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 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	5,500,000 ore.
Do.	do.	Mufulira Mine	2,500,000 ore.
Do.	CNMC Luanshya Copper Mines Ltd. (NFC Africa Mining plc, 100%)	Baluba underground mine	1,800,000 ore.
Do.	NFC Africa Mining plc [China Nonferrous Metal Mining (Group) Company Ltd., 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., 85%, and Zambia Consolidated Copper Investments Holdings Plc, 15%)	Chibuluma South Mine, about 12 kilometers west of Kitwe	600,000 ore, which yields about 18,000 copper in concentrate.
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 Finance Ltd., 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 20.6%)	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 smelter	240,000 copper anode (blister copper). ³
Do.	do.	Nkana copper refinery, Kitwe	300,000 copper cathode.

See footnotes at end of table.

TABLE 2—Continued
ZAMBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
<u>Copper and cobalt—Continued</u>			
Metal—Continued	Mopani Copper Mines plc (Carlisa Investments Corp., ⁴ 90%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 10%)	Mufulira in situ leach and solvent extraction-electrowinning ⁵ plant	17,000 copper cathode.
Do.	do.	Mufulira (ISASMELT) smelter	200,000 copper anode.
Do.	do.	Mufulira refinery	275,000 copper cathode.
Do.	do.	Nkana solvent extraction plant	15,000 copper cathode.
Do.	do.	Nkana cobalt plant	2,400 cobalt metal.
Do.	Chambishi Metals plc [Eurasian Natural Resources Corporation PLC (ENRC), 90%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 10%]	Chambishi cobalt plant	27,000 copper cathode, 3,400 cobalt metal.
Do.	Chambishi Copper Smelting Company, Ltd. [China Nonferrous Metal Mining (Group) Company Ltd., 60%, and Yunnan Copper Industry (Group) Co. Ltd., 40%]	Chambishi copper smelter	150,000 copper anode (blister copper).
Do.	First Quantum Mining and Operations Ltd. (First Quantum Minerals Ltd., 100%)	Bwana Mkubwa solvent extraction-electrowinning plant, near Ndola	52,000 copper cathode.
Do.	Sable Zinc Kabwe Ltd. (Metorex Ltd., 100%)	Sable copper leach and electrowinning plant at Kabwe	14,000 copper cathode, 600 cobalt carbonate.
Do.	Sino-Metals Leach Zambia Ltd. [China Nonferrous Metals Mining (Group) Company Ltd., Sino-Africa Mining Investments Ltd., NFC Africa Mining Plc, and China Hainan Construction Co. Ltd.]	Chambishi	8,000 copper cathode.
Do.	Kansanshi Mining plc (Kansanshi Holdings Ltd., ² 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 20.6%)	Kansanshi high-pressure leach and solvent extraction-electrowinning plant	250,000 copper cathode.
Gold, content of ore kilograms	do.	Kansanshi Mine	3,200.
Iron and steel, crude steel	Universal Mining and Chemical Industries Ltd. (Trade Kings Group)	Kafue	100,000.
Lead, metal, secondary	Pagrik Zambia Ltd. (Gravita Group, 100%)	Lusaka	1,000.
Lime, quicklime	Ndola Lime Company Ltd. (Zambia Consolidated Copper Mines Investment Holdings Plc, 100%)	Ndola	300,000. ⁶
Manganese	Small-scale miners	Mansa area, Luapula Province and Mkushi area, Central Province	120,000.
Nickel, Ni content of ore	Albidon Zambia Ltd. (Albidon Ltd., 100%)	Munali Mine, about 60 kilometers south of Lusaka	10,500.
Petroleum, refined 42-gallon barrels	Indeni Petroleum Refinery Ltd. (Government, 100%)	Indeni refinery at Ndola	3,500,000.
<u>Sulfur:</u>			
Pyrite ore, gross weight	Konkola Copper Mines plc (Vedanta Resources Finance Ltd., 79.4%, and Zambia Consolidated Copper Mines Investments Holdings Plc, 20.6%)	Nampundwe Mine, 48 kilometers west of Lusaka	300,000. ³
Sulfuric acid	do.	Nchanga acid plant	675,000.
Do.	First Quantum Minerals Ltd.	Bwana Mkubwa acid plant, near Ndola	350,000.

⁶Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

¹Subsidiary of Lafarge S.A.

²Subsidiary of First Quantum Minerals Ltd.

³Operations suspended. Facility on care-and-maintenance status.

⁴Carlisa Investments Corp. is owned by Glencore International plc, 81.2%, and First Quantum Minerals Ltd., 18.8%.

⁵Closed in 2009.

⁶Plant has the capacity to produce up to 5,000 metric tons of hydrated lime (slaked) from quicklime.