

THE MINERAL INDUSTRY OF CONGO (KINSHASA)

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The Democratic Republic of the Congo (Congo [Kinshasa]) was a producer of cobalt, columbium (niobium) and tantalum, copper, germanium, gold, and tin ores, and small amounts of steel and refined cobalt. The country also produced cement, crushed stone, diamond and colored gemstones, coal, and crude petroleum. Congo (Kinshasa) had substantial resources of zinc but has not been a producer since 2002.

In 2004, the nominal gross domestic product (GDP) based on purchasing power parity of Congo (Kinshasa) amounted to about \$37 billion; the per capita GDP was about \$630. The real GDP increased by 6.8% in 2004 compared with 5.7% in 2003. The mining sector accounted for 10% of the GDP; manufacturing, 5%; construction and public works, 4%; and electricity and water, 3%. In 2004, the mining sector grew by an estimated 16% compared with 13% in 2003 and 10% in 2002 (International Monetary Fund, 2005a, p. 60, 62; 2005b, p. 212; 2005^{§1}).

In spite of the signing of a peace agreement and the formation of a transitional Government in 2003, civil unrest continued in eastern Congo (Kinshasa) in 2004. The control of natural resources, especially tin mines, allegedly played an important role in the conflict between the Mai-Mai militia and Rassemblement Congolais pour la Démocratie-Goma (RCD-G) in June and September 2004, and between the Government and RCD-G in December. In the second half of 2004, the control of the Djalasiga gold mine in Ituri Province allegedly played an important role in the conflict between the Front des Nationalistes et Intégrationnistes and the Forces Armées du Peuple Congolais, which were local militias (Global Witness, 2005, p. 8, 16; Human Rights Watch, 2005, p. 94-96).

Commodity Review

Metals

Cobalt and Copper.—Congo (Kinshasa) was one of the world's leading cobalt producers. Mine production of cobalt rose to 8,900 metric tons (t) in 2004 from 7,300 t in 2003, and refined cobalt production fell to 735 t in 2004 from 1,200 t in 2003. In 2004, mine production of copper increased to 73,300 t from 59,800 t in 2003 (table 1).

First Quantum Minerals Ltd. of Canada produced copper ore from the Lonshi Mine; the company shipped its ore across the border with Zambia to the Bwana Mkubwa solvent extraction-electrowinning facility. In 2004, the Lonshi Mine produced 669,000 t of ore at a grade of 5.5% copper compared with 711,000 t of ore at a grade of 4.8% copper in 2003. Bwana Mkubwa produced 41,546 t of copper in 2004 compared with 29,513 t in 2003; the increase was partially attributable to a new ore delivery system. Production at Bwana Mkubwa was

expected to be between 40,000 t and 45,000 t in 2005 (First Quantum Minerals Ltd., 2005).

In May 2004, First Quantum announced that resources at the Frontier deposit (formerly known as the Lufua deposit) amounted to 87.6 million metric tons (Mt) at a grade of 1.17% copper. The company planned to complete an updated resource estimate in the first half of 2005 (First Quantum Minerals Ltd., 2005).

Anvil Mining Ltd. of Australia operated the Dikilushi copper mine, which is located near Lake Mweru in Katanga Province. The company exported copper concentrates from the Dikilushi Mine to Namibia for smelting. In 2004, Anvil produced 12,074 t of copper from 270,000 t of ore compared with 13,875 t of copper from 274,000 t in 2003. The increase in the recovery rate to 81% in the fourth quarter of 2004 from 68% in the fourth quarter of 2003 was more than offset by lower grades of ore. In August 2004, Anvil completed a 50% expansion that raised the production capacity to 20,000 metric tons per year (t/yr) of copper (Anvil Mining Ltd., 2004a, p. 5; 2005).

In November 2004, Anvil announced that it had signed a joint-venture agreement with the state-owned Generale Des Carriers Et Des Mines (Gecaminés) and Emiko sprl for the Mutoshi copper-cobalt project near Kolwezi. Anvil agreed to purchase a 70% share in the project; the company planned to produce 25,000 t/yr of copper from the Kulumaziba deposit starting at the end of 2005. In November, Anvil also signed a joint-venture agreement with Gecaminés and Emiko to carry out a feasibility study on the Kinsevere and the Nimbulwa copper-cobalt deposits in Katanga Province (Anvil Mining Ltd., 2005).

Gecaminés and its joint-venture partners produced 19,700 t of copper in 2004 compared with 16,400 t in 2003 and 29,600 t in 1999. The company's production has been inhibited by aging equipment; a lack of investment, fuel, and spare parts; and poor infrastructure (International Monetary Fund, 2005a, p. 66).

Adastra Minerals Inc. of the United Kingdom (formerly American Mineral Fields Inc.) was engaged in a joint venture with Gecaminés to develop the Kolwezi tailings project. The companies planned an initial production level of 30,000 t/yr of copper and 5,000 t/yr of cobalt. Resources were estimated to be nearly 113 Mt at grades of 1.49% copper and 0.32% cobalt (Adastra Minerals Inc., 2004b).

Central African Mining and Exploration Company plc (CAMEC) of the United Kingdom and Enterprises Swanepoel were engaged in a joint venture to build a cobalt processing plant at Kambove. Production was expected to start in the second half of 2005; initial capacity was expected to be 1,200 t/yr of cobalt in concentrates. CAMEC planned to increase capacity to nearly 2,900 t/yr (Central African Mining and Exploration Company plc, 2004).

Gold.—Artisanal and small-scale miners produced gold in Ituri Province in eastern Congo (Kinshasa). National gold production was estimated to be 5,700 kilograms (kg) of gold in 2004 compared with 4,100 kg in 2003 and 7,200 kg in 2000 (table 1).

¹References that include a section mark (§) are found in the Internet References Cited section.

In February 2004, Moto Goldmines Ltd. of Australia commenced exploration for gold in the Kilo Moto goldfield in Ituri Province. The Moto Project included the Durba-Karagba, the Gorumbwa, the Kibali, the Ndala, the Pakaka, the Pamao, and the Tete Bakangwe deposits. In October, the company reported that resources at Gorumbwa, Kibali, and Pakaka were 43 Mt at a grade of 3.1 grams per metric ton (g/t) gold. Moto planned to complete a resource estimate that included Durba-Karagba, Ndala, Pamao, and Tete Bakangwe in the first quarter of 2005. Prefeasibility work was expected to start in early 2005 (Moto Goldmines Ltd., 2004).

Banro Corp. of Canada held the Kamituga, the Lugushwa, the Namoya, and the Twangiza properties in eastern Congo. Measured and indicated resources of contained gold for these properties were estimated to be nearly 63,000 kg. The company began exploration at Namoya in December 2004. Banro planned a \$10 million exploration program for Kamituga, Lugushwa, Namoya, and Twangiza to double the measured and indicated resources. The company also planned an initial scoping study for Twangiza for the second half of 2005 (Tassell, 2005).

In December 2003, CAMEC was awarded exploration licenses at Moba that covered 3,250 square kilometers (km²). In 2004, the company's exploration focused on the Lufuka River Valley, which was in the Tanganyika District of Katanga Province (Central African Mining and Exploration Company plc, 2004).

Silver.—Anvil produced silver as a coproduct at the Dikilushi copper mine. In 2004, silver production amounted to 32,953 kg compared with 35,501 kg in 2003 and 2,108 kg in 2002. Production fell because of lower ore grades. In August 2004, the company completed a 50% expansion that raised production capacity to 50,000 kilograms per year of silver (Anvil Mining Ltd., 2004, p. 5; 2005).

Tin.—Artisanal miners produced cassiterite at Kalima in Maniema Province, at the Bisuru Bibatama Mine near Masisi and the Bisie Mine near Walikale in Nord Kivu Province, and at Miki in Sud Kivu Province. National tin mine production increased to an estimated 2,100 t in 2004 from 800 t in 2003 and 50 t in 2000 because of rising global demand for tin. The increase in demand was partially attributable to environmental regulations in Europe and Japan that mandated the reduction of lead use in printed circuit boards. Most production was unreported and smuggled out of the country through Rwanda (Global Witness, 2005, p. 4, 14).

In December 2004, Metal Processing Association (MPA) signed an exclusive marketing deal with the state-owned mining company Société Aurifère de Kivu et Maniema for all cassiterite production and exports through the end of 2009. MPA was also awarded 37 concessions in eastern Congo (Kinshasa) that it planned to bring into production in 2005 or 2006. The company planned to spend \$30 million to build a new smelter with a capacity of 5,000 t/yr. MPA expected to export 400 t/yr of tin to South Africa and substantial amounts to China (Global Witness, 2005, p. 20).

In December 2003, CAMEC was awarded exploration licenses that covered 5,000 km² in Katanga Province; these properties were located near cassiterite mines. CAMEC was

also considering the development of a small tin mining and smelting operation. The project was expected to produce 240 t/yr of tin; CAMEC planned to make a decision by the first quarter of 2005 (Central African Mining and Exploration Company plc, 2004).

Zinc and Germanium.—In August 2004, Adastra resumed negotiations with Gecaminés on an agreement to resume production of zinc at the Kipushi Mine in Katanga Province. Measured and indicated resources at Kipushi were 16.9 Mt at grades of 16.7% zinc and 2.2% copper (Adastra Minerals Inc., 2004a).

Gecaminés and Enterprises Swanepoel Ltd. were in a joint venture to develop a project to reprocess zinc and germanium tailings near Kolwezi. Resources were estimated to be 1 Mt at grades of 20% zinc, 500 g/t germanium, and 200 g/t silver. CAMEC had the option to participate in this project; the company planned to make a decision by mid-2006 (Central African Mining and Exploration Company plc, 2004, undated\$).

Industrial Minerals

Cement.—Congo (Kinshasa) had four cement plants with a combined capacity of nearly 930,000 t/yr. Cement production rose to 402,500 t in 2004 from 331,000 t in 2003 and 173,000 t in 1999. The increase may have been attributable to rapid growth in the construction industry (International Monetary Fund, 2005a, p. 62, 66).

Diamond.—National diamond production increased to nearly 30.9 million carats in 2004 from 27 million carats in 2003 and 20.1 million carats in 1999. Exports of diamond amounted to \$828 million in 2004, or nearly 46% of total exports (International Monetary Fund, 2005a, p. 66, 86).

The state-owned Société Minière de Bakwanga (MIBA) produced mostly industrial and near-gem quality diamond at Mbuji-Mayi in Kasai-Oriental Province. The company produced more than 7.3 million carats in 2004. MIBA planned to increase production to 8.5 million carats in 2006 and 10 million carats in 2008 and to raise the percentage of gem-quality diamond mined to 6% in 2008 from less than 4% in 2003 (Tshofu, 2004; Northwest Territories Department of Industry, Tourism and Investment, 2005, p. 11).

An estimated 700,000 artisanal miners produced diamond at Luozi in Bas-Congo Province; at Gbadolite, Kota-Koli, and Yakoma in Equateur Province; at Bafwansende and Kisangani in Haut-Congo Province; at Lubutu in Maniema Province; and at various operations in Bandundu, Kasai-Occidental, and Nord Kivu Provinces. Reported artisanal diamond production increased to 22.1 million carats in 2004 from 19.1 million carats in 2003 and 15.3 million carats in 1999. The increase in reported production was attributable to the Government's participation in the Kimberley Process certification program for eliminating trade in conflict diamond and the abolition of the diamond export monopoly granted to International Diamond Industries (International Monetary Fund, 2005a, p. 48-49, 66).

In May 2004, SouthernEra Diamonds Inc. of Canada reported that it had been awarded 41 exploration licenses near Mbuji-Mayi that covered 13,000 km²; these properties were prospective for primary and alluvial deposits. By October,

SouthernEra had engaged in exploration for kimberlites on 21 of these properties. The company also was awarded exploration permits in the Tshikapa/Kasai/Luebo alluvial diamond field in Kasai-Occidental Province and another alluvial diamond field in Kasai-Oriental Province. SouthernEra planned a systematic exploration program for alluvial diamond in early 2005 (Tassell, 2005).

CAMEC was awarded exploration licenses for properties that covered 12,000 km² in the Sankuru District of Kasai Province in April 2004. The company subsequently engaged in exploration at these properties and planned the acquisition of new properties covering 2,150 km². In August, Gravity Diamonds Ltd. of Australia signed a joint-venture agreement with BHP Billiton Ltd. of Australia to explore BHP's properties in the Kasai Craton. In October, BRC Diamond Corp. of Canada was awarded 13 exploration licenses for diamond in the Luabo District of Kasai Province; these properties covered about 4,900 km² (Central African Mining and Exploration Company plc, 2004; Tassell, 2005).

Gemstones.—Tourmaline was produced from granitic pegmatites in eastern Congo (Kinshasa). Most of these pegmatites were in the rare-metal class and were associated with Early Proterozoic granites. Pegmatites in eastern Congo (Kinshasa) were found in the Katanga, Nord Kivu, and Sud Kivu Provinces. In early 2004, a mine in an undisclosed location produced an estimated 20 to 30 kilograms per month of tourmaline; production appears to have decreased later in the year. A 3-kg sample from this mine was 30% gem-quality, 60% cabochon-quality, and 10% bead-quality. Most of the tourmaline was green; blue-green, yellow-green, and pink rough also was produced (Laurs, Simmons, and Falster, 2004)

Mineral Fuels

Petroleum.—Perenco S.A. of France and its joint-venture partners produced crude petroleum from fields that included the Liawenda and the Tschiede; Total S.A. of France also produced petroleum. Crude petroleum production increased to 10.1 million barrels (Mbbbl) in 2004 from 9.2 Mbbbl in 2003 and 8.7 Mbbbl in 1999. Exports of crude petroleum amounted to \$360 million in 2004, or 20% of total exports (International Monetary Fund, 2005a, p. 86).

Congo's only petroleum refinery shut down in 1999; the country relied on imports to meet its petroleum product requirements. In 2004, imports of petroleum products amounted to \$130 million, or 6% of total imports (International Monetary Fund, 2005a, p. 87).

Outlook

Production of cobalt, copper, diamond, germanium, gold, and tin in Congo (Kinshasa) could rise and zinc production could restart in the near future. Cobalt and copper production could increase because of the Kambove, the Kolwezi tailings,

and the Mutoshi projects; diamond, because of the expansion of MIBA's operations; gold, because of the Moto project; tin, because of new smelters proposed by CAMEC and MPA; and zinc and germanium, because of the Kipushi and the Kolwezi projects. The development of these projects depended heavily upon political and economic stability and favorable conditions in world markets. The outlook for gold and tin was particularly dependent upon political stability because of continued civil unrest in eastern Congo (Kinshasa).

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TABLE 1
CONGO (KINSHASA): PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2000	2001	2002	2003	2004
METALS					
Cobalt:					
Mine output, Co content ^{2,3}	11,000 ^e	11,600 ^r	11,900 ^r	7,300 ^r	8,900
Metal, Co content ⁴	4,320	3,199 ^r	2,149 ^r	1,200 ^r	735
Columbium (niobium) and tantalum:					
Columbite-tantalite concentrate: ⁵					
Gross weight	450	200 ^e	100 ^e	50	50
Nb content ^e	130	60	30	25	25
Ta content	130	60	30	25	25
Copper:					
Mine output, Cu content	30,800 ^r	37,800 ^r	34,000 ^{r,e}	59,800 ^r	73,300
Metal, primary:					
Smelter, electrowon (low grade)	33,000 ^r	25,000 ^r	10,000 ^r	8,000	20,000
Refined, electrolytic	-- ^r	-- ^r	-- ^r	-- ^r	--
Germanium kilograms	--	--	3,500	2,500	2,500
Gold ^e do.	7,200 ^r	6,100 ^r	7,600 ^r	4,100 ^r	5,700
Silver do.	--	--	2,108 ^r	35,501 ^r	32,953
Steel ³	159,000	307,000 ^r	150,000 ^r	140,000 ^r	130,000
Tin ^e	50	200 ^r	250 ^r	800 ^r	2,100
Zinc, mine output, Zn content	-- ^r	1,014	--	--	--
INDUSTRIAL MINERALS					
Cement, hydraulic ³	169,000	201,000	265,000 ^r	331,000	402,500
Diamond:^{3,6}					
Artisanal thousand carats	11,366 ^r	11,843 ^r	15,629 ^r	19,142 ^r	22,128
Large-scale do.	4,640 ^r	6,355 ^r	6,050 ^r	7,839 ^r	8,752
Total do.	16,006 ^r	18,198 ^r	21,679 ^r	26,981 ^r	30,880
Lime ^e	25,000	25,000	25,000	25,000	25,000
Stone, crushed ³	191,000 ^r	185,000 ^r	194,000 ^r	203,000 ^r	213,000
Sulfuric acid ^e	80,000	80,000	80,000	80,000	15,000
MINERAL FUELS AND RELATED MATERIALS					
Coal, bituminous ^e	--	1,000	1,000	1,000	1,000
Petroleum, crude ³ thousand 42-gallon barrels	8,500	9,400 ^r	8,400 ^r	9,200 ^r	10,100

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. -- Zero.

¹Table includes data available through December 20, 2005.

²Includes mine production and reprocessed tailings.

³Reported data from International Monetary Fund Country Report No. 05/373, October 2005.

⁴Salable refined production only; excludes white alloy and matte.

⁵Columbite-tantalite concentrates are produced by artisanal miners, but data on production are speculative and unreliable for estimating.

⁶An estimated 20% of total diamond is gem quality; the majority of production is from artisanal mining.