



# 2007 Minerals Yearbook

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## CENTRAL AFRICAN REPUBLIC, CÔTE D'IVOIRE, AND TOGO

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# THE MINERAL INDUSTRIES OF CENTRAL AFRICAN REPUBLIC, CÔTE D'IVOIRE, AND TOGO

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## CENTRAL AFRICAN REPUBLIC

Clay, diamond, gold, limestone, and sand and gravel were the only mineral commodities reported as being produced in Central African Republic. The country's undeveloped mineral resources included copper, graphite, ilmenite, iron ore, kyanite, lignite, manganese, monazite, quartz, rutile, salt, tin, and uranium. Subsistence farming was the mainstay of the economy and accounted for about 50% of the gross domestic product (GDP). The mining sector represented about 7% of the GDP; rough diamond and timber were the country's leading export products (African Development Fund, 2007, p. 3; World Trade Organization, 2007, p. vii).

### Production

Production of gold and diamond, which was mostly artisanal, came from the regions of Berberati, Haute-Kotto, and Haute-Sangha. In 2007, diamond production increased by about 11.5% to 467,711 carats from a revised 419,528 carats in 2006 (table 1); diamond exports, which were mainly destined for Europe and Israel, amounted to about 418,000 carats and were valued at \$59.8 million. Data on mineral production are in table 1.

### Structure of the Mineral Industry

Production and trade of diamond and gold were overseen by Bureau d'Evaluation et de Contrôle de Diamant et d'Or (BECDOR). BECDOR maintained the country's diamond and gold production database and assessed the value of diamond parcels that came from the various diamond exporting companies (collectively known as bureaux d'achat) operating in the country.

### Commodity Review

#### Metals

**Gold.**—Axmin Inc. of Canada continued to work on the development of the Passendro gold project, which is located about 60 kilometers (km) from the town of Bambari. The company planned to develop an open pit mine operation with a gravity carbon-in-leach processing plant. The mine was to produce about 6,900 kilograms per year (kg/yr) of gold (reported as 223,000 troy ounces) during the first 3 years of operation and then would produce an average of 6,200 kg/yr of gold (reported as 200,000 troy ounces) for the remaining life of the mine, which was estimated to be 5.9 years. Gold production was expected to begin in 2010 (Axmin Inc., 2008, p. 1-5).

London-based Pan African Resources plc explored for gold at the Bogoin gold concession, which was located in southwestern

Central African Republic about 120 km north of the capital city of Bangui and at the Dekoa concession, which was located in the west-central part of the country about 330 km from Bangui (Pan African Resources plc, 2008).

Prospero Minerals Corp. of the United States relinquished the gold exploration and mining licenses that it had acquired from Lobaye Gold SARL in March 2006. The company cited that this was because these licenses had apparently been suspended by the Government in May 2006, 3 months before they were transferred to Prospero in August 2006 (U.S. Securities and Exchange Commission, 2007).

**Iron Ore.**—Axmin was to invest \$600,000 in a drilling program for the Topa Hill iron ore prospect. Topa Hill, which was discovered by Axmin in 2006, is located within the company's Bambari-Bakala concession and consists of two iron-rich northwest-trending ranges of hills reportedly containing ore that graded about 64% iron (Axmin Inc., 2008, p. 1).

#### Industrial Minerals

**Diamond.**—All diamond produced in the country was from alluvial deposits; no primary sources of diamond had been discovered by yearend 2007. At least three companies explored for diamond in 2007, including Energem Resources Inc. of Canada, Gem Diamonds Ltd. of the United Kingdom, and Pangea Diamondfields plc. of the British Isles. On November 13, 2007, Energem relinquished its diamond exploration rights for the Bangana, the Bria, the Kotto, and the Quadda concession areas (Energem Resources Inc., 2008, p. 15; Pangea Diamondfields plc, 2008, p. 10-11).

#### Mineral Fuels and Related Materials

**Petroleum.**—Central African Republic did not produce mineral fuels and depended upon imports for its energy requirements. United Reef Ltd. of Canada, which had obtained the rights to a petroleum exploration permit in the country through a farm-in agreement with Denver-based RSM Production Corp. (RSM) in 2004, was unable to continue with its exploration activities in 2007. RSM had declared force majeure under the terms of an agreement with the Government in April 2003 because of civil unrest in the country in 2001 that eventually led to a coup in March 2003. After the coup, a new transitional Government was formed, and RSM was unable to resolve its force majeure status reportedly owing to the Government's failure to acknowledge suspension of its contract under the claim of force majeure. In 2007, RSM announced that its application to the International Center for Settlement of Investment Disputes requesting arbitration of the contract dispute had been formally registered and that a case number had

been assigned. The company's exploration permit was for the Doseo and the Salamat basins in the northern part of the country (United Reef Ltd., 2008).

**Uranium.**—In July 2007, French-owned Areva Group announced that it had acquired 92.93% of the shares of South Africa-based UraMin Inc. With this acquisition, Areva took hold of a 90% working interest in 10 separate areas of uranium mineralization at Bakouma in south-central Central African Republic. UraMin had begun an exploration drilling program on the Patricia North deposit in August 2006 and had planned to complete a feasibility study during the third quarter of 2008. Areva planned to integrate UraMin as quickly as possible to optimize synergies with its existing mining activities (Areva Group, 2007).

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## CÔTE D'IVOIRE

Mineral commodities produced in Côte d'Ivoire included cement, clay, diamond, gold, gravel and crushed stone, manganese, natural gas, niobium (columbium), crude petroleum and petroleum products, sand, sulfuric acid, and tantalum. Undeveloped mineral resources included bauxite, cobalt, copper, iron ore, nickel, and silica sand. The Ivorian economy was largely dependent on agriculture, and coffee and cocoa were the principal export crops.

On March 4, 2007, a peace agreement known as the Ouagadougou agreement was signed between the Government of Côte d'Ivoire and the leader of the Forces Nouvelles rebel group after 8 years of political instability that followed the country's first coup d'état in December 1999 (United Nations Security Council, 2007a; U.S. Department of State, 2009). The Ouagadougou agreement led to the signing of an emergency post-conflict economic reform program, which was partly funded by the International Monetary Fund, on August 3, 2007, along with the development of a plan to clear the country's debts to the African Development Bank and the World Bank (African Development Bank, 2008, p. 259-260).

During the civil war, Ivorian rebel forces had taken control of the northern parts of the country by establishing roadblocks that

disrupted travel and transport. In September 2007, commercial exports by road were resumed, and Côte d'Ivoire sent its first truck convoy carrying natural gas and jet fuel north to Burkina Faso. Before the signing of the Ouagadougou agreement, hydrocarbon products had been imported by rail from Abidjan, Côte d'Ivoire, to Ouagadougou, in Burkina Faso (Creamer Media's Engineering News, 2007).

Côte d'Ivoire exported electricity produced from natural gas and hydroelectric sources to Benin, Burkina Faso, Ghana, and Togo. It was estimated that the country would face power shortages by 2009 owing to increasing domestic and foreign demand for electricity. Increases in domestic demand for electricity were reportedly driven by the increase in low-cost Asian-manufactured household appliances, and foreign demand was driven by power shortages in such countries as Ghana, where drought had affected the sources for hydroelectric power generation. Electricity supply in the rebel-controlled northern part of the country had reportedly not been interrupted during the civil war period (Australia's Paydirt, 2007).

## Production

Manganese production increased by 42% to 80,850 metric tons (t) in 2007 from 56,829 t in 2006. Gold production decreased by 6% to 1,243 kilograms (kg) from 1,324 kg; crude petroleum production decreased by about 19% to 17,727 barrels (bbl) from 21,955 bbl. Data on mineral production are in table 1.

## Structure of the Mineral Industry

At least two Indian-based companies were actively exploring for mineral commodities in Côte d'Ivoire in 2007. These included Tata Steel Ltd., which explored for iron ore, and Taurian Resources Private Ltd., which explored for manganese. Perseus Mining Ltd. of Australia and Randgold Resources Ltd. of the United Kingdom explored for gold.

## Commodity Review

### Metals

**Gold.**—The decrease in production from the Ity Mine, which was owned by France-based La Mancha Resources Inc., was reportedly the result of a lower gold recovery rate owing to a higher sulfide content of the ore from the Zia pit. The Government renewed La Mancha's mining contract until 2013 in exchange for the transfer of a 5.1% interest in the Ity Mine to the Government. As a result, La Mancha's interest in the project was reduced to 45.9% from 51%. The remaining interest in the project was held by Société pour le Développement Minier (SODEMI) (44.1%) and the Government (10%) (La Mancha Resources Inc., 2008, p. 7-9).

Equigold NL of Australia through its subsidiary Equigold Côte d'Ivoire S.A. continued to work on the development of the Bonikro gold project. As of June 30, 2007, mineral resources at Bonikro were estimated to be about 28 million metric tons (Mt) at an average grade of 1.92 grams per metric ton (g/t) gold. By the end of the year, construction work had commenced

onsite and was focused on access road construction, plant site clearing, surveying, site earthworks, concrete works in the carbon-in-leach area, and building construction. Commissioning of the processing plant was scheduled for April 2008, and first commercial production was expected by May 2008. The estimated mine life of the project was 8 years at an estimated average production rate of about 3,700 kg/yr (reported as 120,000 troy ounces per year). Gold reserves at Bonikro were estimated to be 16 Mt at a grade of 1.8 g/t gold (Equigold NL, 2008).

Randgold Resources continued to work on a 30,000-meter drilling program for the Tongon gold project, which was to form the basis for a final feasibility study. Infill drilling along a 1.5-km-long structure in the northern zone had confirmed continuity of the geology and mineralization. A decision on whether to develop a mine or not was to be made in 2008 (Randgold Resources Ltd., 2007).

By the end of 2007, Cluff Gold plc. of the United Kingdom reported that all pads and ponds at the Angovia Mine, which is located about 40 km northwest of Yamoussoukro, were completed. In addition, a dry plant had been commissioned and a processing plant was 80% completed. The Angovia gold mine operated between 1998 and 2003, reportedly producing about 5,600 kg of gold (reported as 180,000 troy ounces) during that period. In 2004, Cluff Gold concluded the purchase of exploration data covering the Mount Yaoure license, including drill assay results from drilling completed around the Angovia Mine. The data were purchased from the previous license holder, Compagnie Minière d'Or SA, which was a subsidiary of Compagnie Générale des Matières Nucléaires S.A. The reopening of the Angovia Mine was scheduled for early 2008, and the mine was expected to produce about 1,240 kg/yr of gold (Cluff Gold plc., 2007, 2008).

**Iron Ore.**—Tata Steel signed a joint-venture agreement with Government-owned Société pour le Développement Minier de la Côte d'Ivoire on December 11, 2007, for the development of the Mount Nimba iron ore deposit. The Mount Nimba deposit is spread over three countries—Guinea, Côte d'Ivoire, and Liberia—and was estimated to host about 1 billion metric tons of iron ore reserves. Tata Steel, which held a 75% interest in the project, planned to invest \$1.5 billion to develop the mine and related infrastructure. The initial phase of the project would involve the completion of exploration and detailed feasibility assessments followed by the development of a mine and beneficiation facilities. The mine was expected to be completed by 2010. As much as 60% of the iron ore from the mine would be supplied to Tata Steel facilities located in the United Kingdom and the Netherlands (Creamer Media's Mining Weekly, 2007; Mineweb, 2007).

**Manganese.**—Taurian Resources explored for manganese in the Zanzan region in northeastern Côte d'Ivoire. The company held two exploration licenses—one for the Bondokou area, which consisted of numerous hills containing manganese mineralization, and one for the Toumodi area, which consisted of two hills containing manganese mineralization. Four target areas (the Borumba, the Kofu, the Nanyango, and the Siminimi deposits) were identified within the Bondokou area, and two target areas (the Blafo and Ghetto targets) were identified within the Toumodi area. The company was in the early stages of

exploration and was in the process of conducting geophysical analyses and drilling, blasting, and pitting at some of the prospective areas during the year (Taurian Resources Private Ltd., 2009a, b).

The Government, through Société pour le Développement Minier de la Côte d'Ivoire, reported first manganese production from a pilot plant to be 56,830 t in 2006 and 80,850 t in 2007. It was not clear whether this production was from Taurian Resources operations in Bondokou and Toumodi or from other sources within the country (Mr. Jean Likane-Yagui, General Manager, Société pour le Développement Minier de la Côte d'Ivoire, written commun., August 18, 2008).

### *Industrial Minerals*

**Diamond.**—Kimberlites were known to occur at Kanangone, Seguela, and Tortiya; diamond was produced only from alluvial deposits at Seguela and Tortiya. Despite some progress on the political front, on October 29, 2007, the United Nations Security Council renewed until October 31, 2008, the ban that it had imposed on rough diamond originating in Côte d'Ivoire, stating that the situation in the country continued to pose a threat to international peace and security in the region (United Nations Security Council, 2007b).

### *Mineral Fuels*

Construction of a second petroleum refinery with a capacity of 60,000 bbl/d was underway in 2007. The construction of the refinery was to be funded by a consortium of United States-based Energy Allied International and WCW International and Government-owned Société Nationale d'Opérations Pétrolières de la Côte d'Ivoire (PETROCI). The refinery was to be completed by 2011. Energy Allied and WCW International each held a 30% interest in the project, and PETROCI held the remaining 40% interest. The consortium planned to build West Africa's first strategic storage facility for petroleum products and crude petroleum adjacent to the refinery in conjunction with other multinational companies. The refinery and storage facilities would be built on a peninsula between the Atlantic Ocean and the Ebrie lagoon, west of Abidjan's Vridi port canal (Alexander's Gas & Oil Connections, 2007; Oil & Gas Journal, 2007).

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## TOGO

Mineral commodities produced in Togo included cement, clinker, diamond, gold, limestone, and phosphate rock. Undeveloped mineral resources included bauxite, gypsum, iron ore, manganese, marble, rutile, and zinc. According

to International Monetary Fund reports, Togo had been experiencing an economic, political, and social crisis since the early 1990s, which had severely hampered the country's effort to achieve development (International Monetary Fund, 2008, p. 1-4).

Subsistence farming and commerce were the main economic activities in the country; most of the industrial activity was limited to phosphate rock production. Phosphate rock production, however, decreased by about 55% in 2007 owing in part to the depletion of easily accessible phosphate rock deposits and a lack of funds for new investment. In September 2007, the Government obtained a loan from the Islamic Development Bank to inject capital into the sector and production was expected to increase to 1.4 Mt in 2008 (U.S. Department of State, 2009).

## Production

Data on mineral production are in table 1.

## Structure of the Mineral Industry

At least one company, Lithic Metals and Energy Ltd. explored for chromite, nickel, and uranium in Togo in 2007. Table 2 is a list of major mineral industry facilities.

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TABLE 1  
CENTRAL AFRICAN REPUBLIC, CÔTE D'IVOIRE, AND TOGO: ESTIMATED PRODUCTION OF MINERAL COMMODITIES<sup>1,2</sup>

(Metric tons unless otherwise specified)

Country and commodity	2003	2004	2005	2006	2007	
<b>CENTRAL AFRICAN REPUBLIC<sup>3</sup></b>						
Clay	NA	NA	NA	78,886 <sup>4</sup>	79,000	
Diamond <sup>5</sup>	carats	332,700 <sup>4</sup>	350,000	383,300 <sup>4</sup>	419,528 <sup>r,4</sup>	467,711 <sup>4</sup>
Gold	kilograms	7 <sup>4</sup>	7	15 <sup>r,4</sup>	10 <sup>4</sup>	10
Limestone		NA	NA	85,000 <sup>4</sup>	85,000 <sup>4</sup>	85,000
Sand and gravel		NA	NA	NA	172,436 <sup>4</sup>	173,000 <sup>c</sup>
<b>CÔTE D'IVOIRE<sup>6</sup></b>						
Cement		650,000	650,000	650,000	650,000	650,000
Diamond	carats	230,000	300,000	300,000	300,000	300,000
Gold <sup>7</sup>	kilograms	1,313 <sup>4</sup>	1,219 <sup>4</sup>	1,335 <sup>4</sup>	1,324 <sup>4</sup>	1,243 <sup>4</sup>
Gravel and crushed stone		600,412 <sup>4</sup>	659,097 <sup>4</sup>	660,000	660,000	660,000
Manganese ore		--	--	--	56,829 <sup>4</sup>	80,850 <sup>4</sup>
Natural gas	million cubic meters	1,457 <sup>4</sup>	2,000 <sup>4</sup>	2,200 <sup>4</sup>	2,200	2,200
<b>Niobium (columbium) and tantalum:</b>						
Columbite	kilograms	130	130	130	130	130
Tantalite	do.	400	400	400	400	400
<b>Petroleum:</b>						
Crude	thousand 42-gallon barrels	7,506 <sup>4</sup>	8,125 <sup>4</sup>	14,574 <sup>4</sup>	21,955 <sup>r,4</sup>	17,727 <sup>4</sup>
Refinery products	do.	19,000	19,000	19,000	19,000	19,000
Sand		233,737 <sup>4</sup>	173,056 <sup>4</sup>	173,000	173,000	173,000
Sulfuric acid		3,000	3,000	3,000	3,000	3,000
<b>TOGO<sup>8</sup></b>						
<b>Cement:</b>						
Clinker		1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Hydraulic <sup>9</sup>		800,000	800,000	800,000	800,000	800,000
Diamond	carats	87,200	123,000	41,000	28,176 <sup>r,4</sup>	17,362 <sup>4</sup>
Limestone		2,400,000	2,400,000	2,400,000	2,400,000	2,400,000
<b>Phosphate rock, beneficiated product:</b>						
Gross weight	thousand metric tons	1,471 <sup>4</sup>	1,115 <sup>4</sup>	1,350	1,650	750
P <sub>2</sub> O <sub>5</sub> content	do.	530	418 <sup>4</sup>	481	590 <sup>4</sup>	270

<sup>1</sup>Revised. do. Ditto. NA Not available. -- Zero.

<sup>2</sup>Estimated data are rounded to no more than three significant digits.

<sup>3</sup>Table includes data available through March 31, 2009.

<sup>4</sup>In addition to the commodities listed, Central African Republic produced quartz crystals, but information is inadequate to make reliable estimates of output.

<sup>5</sup>Reported figure.

<sup>6</sup>Production is approximately 70% to 80% gem quality.

<sup>7</sup>In addition to the commodities listed, Côte d'Ivoire produced clay and crushed granite, but information is inadequate to make reliable estimates of output.

<sup>8</sup>Does not include production from artisanal mining.

<sup>9</sup>Togo also presumably produced gold, but output is not reported, and available information is inadequate to make reliable estimates of output.

<sup>9</sup>Includes cement produced from imported clinker.

TABLE 2  
CÔTE D'IVOIRE AND TOGO: STRUCTURE OF THE MINERAL INDUSTRIES IN 2007

(Metric tons unless otherwise specified)

Country and commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>CÔTE D'IVOIRE</b>				
Cement		Société des Ciments d'Abidjan	Abidjan plant	750,000.
Do.		Société Ivoirienne de Ciment et Matériaux (Holcim Ltd.)	do.	500,000.
Do.		Société des Ciments du Sud-Ouest	San Pedro	100,000.
Gold	kilograms	Société des Mines d'Ity (La Mancha Resources Inc., 45.9%; Société pour le Développement Minier, 44.1%; Government 10%)	Ity Mine	1,900.
Do.	do.	Yaouré Mining SA (Cluff Gold plc, 90%, and Government, 10%)	Angovia Mine, northwest of Yamoussoukro (under development)	1,240
Manganese		Société pour le Développement Minier de la Côte d'Ivoire	Pilot plant	NA.
Petroleum, crude	thousand 42-gallon barrels	Canadian Natural Resources Ltd., 57.61%; Svenska Petroleum, 27.39%; Société Nationale d'Opérations Pétrolières de la Côte d'Ivoire (Petroci), 15%	Baobab oilfield	17,520.
Do.	do.	Canadian Natural Resources Ltd., 58.67%; Tullow Oil plc, 21.33%; Société Nationale d'Opérations Pétrolières de la Côte d'Ivoire, 20%	East Espoir oilfield	6,700.
Do.	do.	Devon Energy Corp.; Société Nationale d'Opérations Pétrolières de la Côte d'Ivoire (Petroci), Pluspetrol Group; International Finance Corp.	Lion and Panther oilfields	2,000.
Petroleum products	do.	Société Ivoirienne de Raffinage	Abidjan	25,500
<b>TOGO</b>				
Cement <sup>1</sup>		Ciments du Togo	Lome plant	800,000 cement.
Do.		West African Cement Company	Tabligbo	1,000,000 cement; 1,200,000 clinker.
Limestone <sup>1</sup>		Ciments de l'Afrique de l'Ouest	do.	2,400,000.
Phosphate rock		International Fertilizer Group Togo	Akoumape and Hahotue	2,000,000.

Do., do. Ditto. NA Not available.

<sup>1</sup>Based on information available as of yearend 2005.