



2006 Minerals Yearbook

ANGOLA

THE MINERAL INDUSTRY OF ANGOLA

By Omayra Bermúdez-Lugo

Angola's mineral industry was dominated by diamond and petroleum production. Other mineral commodities produced in the country included cement, granite, marble, and, salt. Undeveloped mineral resources included copper, gold, gypsum, iron ore, lead, lignite, manganese, mica, nickel, peat, phosphate rock, silver, and zinc.

Minerals in the National Economy

Petroleum continued to be the major driving force of Angola's economy, accounting for about 51.7% of the gross domestic product, 96% of exports, and 80% of Government revenues. In 2006, Angola ranked seventh among the world's leading producers of rough diamond by volume and fifth in terms of value. The presence of a significant amount of landmines and other unexploded ordnance continued to hinder mining activities in the country. During Angola's 27-year war, Government and rebel forces and foreign armies laid landmines across the country's 18 Provinces. Although the exact number of landmines is unknown, estimates ranged from between 500,000 and 6 million (Kimberley Process Certification Scheme, 2006a, b; U.S. Department of State, 2006; Reuters, 2007).

Foreign direct investment in the oil and mining sectors of the country was growing fast. Angola was Africa's third ranked recipient of foreign direct investment following Morocco and Equatorial Guinea. The discovery of new oilfields, the increasing cost-effectiveness of deepwater exploration in the context of high oil prices, and the strategic interest of American businesses and of such nontraditional partners as China and India were, according to the World Bank, the driving forces behind the investment activity (World Bank Group, 2006, p. 82-84).

Angola was the second ranked trading partner of the United States in sub-Saharan Africa. U.S. exports to sub-Saharan Africa totaled \$12.1 billion in 2006, or about 1.2% of U.S. total world exports of \$1,036 billion. U.S. imports from sub-Saharan Africa totaled \$59.1 billion for the same period, or about 3.2% of U.S. total imports from the world. In 2006, about 20% of all U.S. imports from the region came from Angola and about 13% of all U.S. exports to the region went to Angola. Angola's exports to the United States were valued at about \$11.7 billion in 2006 compared with about \$8.5 billion in 2005. Of this amount, crude petroleum accounted for about \$11.3 billion; fuel oil, about \$238 million; and gem-quality diamond, about \$35.6 million. Imports from the United States were valued at about \$1.5 billion in 2006 compared with a revised \$929 million in 2005; these included nearly \$480 million in drilling and oilfield equipment and about \$8.9 million in excavating machinery (Langton, 2007, p. 6; U.S. Census Bureau, 2008a, b).

Production

In 2006, petroleum production increased by about 12.6% to reach nearly 514 million barrels compared with about 456

million barrels in 2005 (table 1); diamond production increased by 29.6% to reach 9,175 carats compared with 7,079 carats in 2005. Salt production increased by 16% and crude petroleum production increased by 12.6%. Data on mineral production are provided in table 1.

Structure of the Mineral Industry

The Ministério de Geologia e Minas is the Government entity responsible for the negotiation of mineral rights contracts, for enforcing mining laws, and for conducting geologic surveys. All mineral rights in Angola belong to the state, and all mining and prospecting contracts must be approved by the Council of Ministers. Corpo Especial de Fiscalização y Segurança de Diamantes is the Government agency responsible for overseeing the diamond sector. Empresa Nacional de Diamantes de Angola E.P. (Endiama), which is the Government-owned diamond company, is responsible for creating partnerships with international companies prospecting for diamond and is a partner in all diamond ventures. Endiama's subsidiaries include Sociedade de Comercialização de Diamantes de Angola (Sodiam), which is in charge of the marketing, sale, and trade of all diamond produced in Angola and the entity responsible for Kimberley Process compliance; and Endiama Prospecção e Produção S.A.R.L., which oversees all Endiama's mining and prospecting interests. Sociedade Nacional de Combustíveis de Angola (Sonangol) is the Government-owned company responsible for petroleum exploration and production.

Several infrastructure projects were underway in Angola during 2006. One of the projects was the modernization of the Luanda Port at a cost of \$131 million through 2010. About \$24 million was to be spent on the project during the first year of construction. Other projects included the refurbishing of the Benguela and the Mocamedes railways. In January, the tender for the rehabilitation of the Benguela railway was granted to China International Fund Limited. The company expected to complete the project by August 2007 at a cost of \$330.5 million. Once completed, the railway would have the capacity to transport about 20 million metric tons per year (Mt/yr) of cargo. About 700 kilometers (km) of the railway line, which runs from the city of Lobito in Benguela Province to Bie Province in the central highlands, had to be cleared of landmines. Also under reconstruction was the Mocamedes railway, which runs from Namibe on the Atlantic coast in southwest Angola through Lubango and Matala in Huila Province and into Menongue (the capital of Kuando Kubango Province) in the southeastern part of the country. The refurbishment of the Mocamedes railway was also expected to be completed in August 2007 at a cost of \$1.2 billion; it would have the capacity to transport about 15 Mt/yr of cargo (Republic of Angola Embassy in the United Kingdom, 2006b, c).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—Norsk Hydro ASA of Norway was studying the possibility of developing a 600,000-metric-ton-per-year (t/yr) primary aluminum smelter in Angola and a 1,635-megawatt hydroelectric facility to supply electricity to the plant (Mining Journal, 2006b; World Aluminium Market, 2006).

Copper.—Simba Mines Inc. of the United States held the rights to carry out prospecting, survey, and reconnaissance operations on the Benguela (35%), the Cachoeiras de Binga (CDB) (40%), and the Zenza (35%) copper properties in Angola. Measured resources at CDB were reported to be 7.1 Mt of copper ore at a grade of 2.14% copper. The company planned to develop a mine at CDB and to produce about 20,000 t/yr of copper initially and to eventually increase capacity to 50,000 t/yr. In April 2006, Simba announced that it had completed phase 1 of its exploration program for CDB, which consisted of mapping, soil geochemistry, and limited geophysics with the purpose of further extending known resources and conducting a bankable feasibility study. In September, the company entered into a definitive agreement to exchange its mining interest in CDB for shares in Australian Forest Industries Inc. (AUFIL). AUFIL, in turn, announced that it also planned to acquire Rockbury Properties Limited's 40% interest in CDB (Simba Mines Inc., 2006a, b).

Industrial Minerals

Cement.—Cement in Angola was produced by two companies, Companhia de Cimento do Lobito S.A. (Secil-Lobito) and Nova Cimangola S.A. (Cimangola). The Cimangola cement plant, which is located in the city of Luanda, had an annual production capacity of 1.2 Mt/yr of cement and 540,000 t/yr of clinker. In 2006, the Government acquired Cimentos de Portugal, SGPS, S.A.'s 49% interest in Cimangola, which increased its total ownership in the company to 89% (AngolaPress, 2006). The Secil-Lobito plant, which is located in the city of Lobito, Benguela Province, had an annual production capacity of 250,000 t of cement and was owned by TecnoSecil Investimentos e Participações SARL of Portugal (TecnoSecil) (51%) and the Government (49%). In 2006, Secil-Lobito produced 173,000 t of cement, or about 70% of its nameplate capacity (Radio Nacional de Angola, 2007).

Diamond.—In Angola, alluvial and eluvial diamond deposits occur in the Provinces of Cunene, Huambo Bie, Kuando Kubango, Kwanza Sul, Lunda, Malange, Moxico Huila, and Uige. In the northern Provinces, diamond deposits extend into the Democratic Republic of the Congo [Congo (Kinshasa)]. About 700 kimberlite pipes containing reserves of about 50 million carats were known to exist in the country. Other deposits were thought to occur in coastal areas and offshore (Diamonds and Human Security Project, The, 2005, p. 2).

At least 10 companies were engaged in diamond exploration and/or production in Angola in 2006; these companies included Alrosa Company Ltd. (ALROSA) of Russia; BHP Billiton

World Exploration Inc. and New Millenium Resources N.L. of Australia; Daumonty Financing Company B.V. of Israel (which was part of the Lev Leviev Group of Israel); De Beers Group, Petra Diamonds Ltd., and Trans Hex Group Ltd. of South Africa; Odebrecht Mining Services Inc. (Odebrecht) of Brazil; Pangea Diamondfields plc of the United Kingdom; and SouthernEra Diamonds Inc. of Canada.

ALROSA was in the process of developing several projects in the country, which included bringing to design capacity the second phase of the Catoca ore-treatment plant; the commissioning of the first phase and the construction of the second phase of the Camatchia-Camagico ore-treatment plant; the completion of a hydroelectric powerplant on the Chicapa River; and the establishment of a joint-venture prospecting company with Endiama to develop the Cacolo project, which was for an area located in Lunda Norte Province that was prospective for diamond. The company agreed to invest an initial \$14 million in the project (Mining Journal, 2006a; Alrosa Company Ltd., 2007, p. 34).

New Millenium was in negotiations to sell its 20% interest in three diamond concessions in Angola to an entity whose name was not disclosed reportedly for reasons of confidentiality (New Millenium Resources Limited, 2006).

Pangea mined diamondiferous gravels on a pilot mining basis at the Cassanguidi project, which is located 80 km east of Dundo and 30 km north of Nzaji in Lunda Norte Province. The company produced 25,416 carats from Cassanguidi during the period from February 2005 to March 2006. Stone sizes from the main pit ranged from 0.23 to 0.42 carat, and those from river bed gravels ranged from 0.29 to 0.35 carat. Operations at Cassanguidi were hampered during the fourth quarter of 2006 owing to seasonal rains and resulted in diamond production being less than expected for the quarter. The company reported that average diamond revenue from sales to Sodiam had been disappointing and that plans to develop the project further were to be deferred until there was a mechanism in place to ensure sales at market-related levels. The company also began a bulk-sampling program at the Lumuanza project in September 2006 and commissioned a 20-metric-ton-per-hour dense-medium separation plant. A regional exploration program was also begun to further evaluate the potential of the exploration permit area. The company, however, reported that high structural project overheads, financing ratios, and uncertainties regarding mechanisms to sell future output at market prices, among other things, did not justify continued exploration funding and that the company had decided to cease funding the project. Pangea held a 41% interest in the project through Sociedade Mineira do Lumuanza (Pangea DiamondFields plc, 2007a, b).

Mineral Fuels

Petroleum.—Petroleum was produced offshore the enclave of Cabinda, offshore in the Kwanza Basin north of Luanda, offshore the country's northern coast, and onshore near the city of Soyo. According to World Bank reports, most of the premier international oil companies have acquired interests in Angola, including British Petroleum (BP); Chevron Corp. and Exxon Mobil Corp. of the United States; Eni S.p.A of Italy;

Royal Dutch Shell group of the Netherlands; and Total S.A. of France (World Bank Group, 2006, p. 33-34). Following the coming onstream of the Kizomba B project in Block 15, Angola was producing about 1.4 million barrels per day (Mbbbl/d) of petroleum; its production was expected to continue to increase and to reach 1.8 Mbbbl/d by 2007, 2.1 Mbbbl/d by 2008, and 2.5 Mbbbl/d by 2010 (Republic of Angola Embassy in the United Kingdom, 2006e).

The U.S. Energy Information Administration (2007) reported that Angola would likely see peak petroleum production in 2011 of 2.6 Mbbbl/d followed by production declines if no new discoveries were made in the near future. The country consumed about 62,000 barrels per day (bbl/d) of petroleum in 2006; petroleum consumption was expected to increase, however, owing to ongoing and planned infrastructure projects. Proven petroleum reserves, the majority of which were located offshore, were reported to be 8 billion barrels.

Angola had one petroleum refinery, which produced about 40,000 bbl/d. In 2006, the Government signed a partnership agreement with China Petroleum Corporation (Sinopec) to build a second refinery in the city of Lobito, Benguela Province, with a production capacity of about 200,000 bbl/d. The proposed joint venture would operate the refinery under the name of Sonangol Sinopec International. The project was estimated to cost about \$3.5 billion and was expected to be operational by 2010 (Republic of Angola Embassy in the United Kingdom, 2006a, d).

Outlook

According to the World Bank (2006, p. ii, xii) the Angolan economy will experience a massive oil revenue windfall with a concomitant fiscal gain during the next 2 decades or so. Diamond production is also projected to increase significantly. The World Bank suggests that, to a large extent, Angola's diamond sector remains secretive and that, if improvements are to take place in the industry, they will depend on the implementation of a predictable and transparent legal framework that adequately defines the rights and obligations of investors, the guarantee of tenure rights to investors upon obtaining a mining permit, and the Government's success in liberalizing the market and monitoring and regulating the sector.

References Cited

- Alrosa Company Ltd., 2007, 2006 annual report: Moscow, Russian Federation, Alrosa Company Ltd., 53 p.
- AngolaPress, 2006, Govt buys extra 49 percent of Nova Cimangola shares: AngolaPress, October 7, (Accessed October 18, 2006, at <http://www.angolapress-angop.ao/noticia-e.asp?ID=478151>.)
- Diamonds and Human Security Project, The, 2005, 2005 diamond industry annual review: Ottawa, Ontario, Canada, The Diamonds and Human Security Project, 12 p.
- Kimberley Process Certification Scheme, 2006a, Statistical charts: Ottawa, Ontario, Canada, Kimberley Process Certification Scheme. (Accessed February 20, 2008, at https://mmsd.mms.nrcan.gc.ca/kimberleystats/Global_Summary - 2006 chart.pdf.)
- Kimberley Process Certification Scheme, 2006b, Statistical tables: Ottawa, Ontario, Canada, Kimberley Process Certification Scheme. (Accessed February 20, 2008, at https://mmsd.mms.nrcan.gc.ca/kimberleystats/Global_Summary - 2006 data.pdf.)
- Langton, Danielle, 2007, U.S. trade and investment relationship with sub-Saharan Africa—The African Growth and Opportunity Act and beyond: Washington, DC, Congressional Research Service, 27 p.
- Mining Journal, 2006a, Endiama-Alrosa JV: London, United Kingdom, Mining Journal, April 28, p. 10.
- Mining Journal, 2006b, Hydro mulls Angola: London, United Kingdom, Mining Journal, October 6, p. 1.
- New Millenium Resources Limited, 2006, Shareholder update: South Perth, Australia, New Millenium Resources Limited press release, June 23, 4 p.
- Pangea DiamondFields plc., 2007a, Cassanguidi project: Randburg, South Africa, Pangea DiamondFields plc. (Accessed August 21, 2007, at <http://www.pangeadiamondfields.com/cassanguidi.htm>.)
- Pangea DiamondFields plc., 2007b, Exploration update: Randburg, South Africa, Pangea DiamondFields plc. press release, 4 p.
- Radio Nacional de Angola, 2007, Secil Lobito aumenta producao de cimento: Luanda, Angola, Radio Nacional de Angola. (Accessed July 5, 2007, at <http://www.rna.ao/ngolayeto/noticias.cgi?ID=14242>.)
- Republic of Angola Embassy in the United Kingdom, 2006a, Agreement signed on building new refinery: Republic of Angola Embassy in the United Kingdom [London] newsletter, no. 113, March, 8 p.
- Republic of Angola Embassy in the United Kingdom, 2006b, Benguela and Mocamedes railways to be rehabilitated: Republic of Angola Embassy in the United Kingdom [London] newsletter, no. 111, December 2005 to January 2006, 8 p.
- Republic of Angola Embassy in the United Kingdom, 2006c, Modernization of port of Luanda: Republic of Angola Embassy in the United Kingdom [London] newsletter, no. 112, February, 7 p.
- Republic of Angola Embassy in the United Kingdom, 2006d, Oil production attains 1.4 million barrels a day: Republic of Angola Embassy in the United Kingdom [London] newsletter, no. 111, December 2005 to January 2006, 8 p.
- Republic of Angola Embassy in the United Kingdom, 2006e, Training Angolans for the oil industry: Republic of Angola Embassy in the United Kingdom [London] newsletter, no. 111, December 2005 to January 2006, 8 p.
- Reuters, 2007, Oil and diamond-rich country slow to rebuild: Reuters, March 30. (Accessed February 20, 2008, at http://www.alertnet.org/db/crisisprofiles/AO_REC.htm?v=in_detail)
- Simba Mines Inc., 2006a, Overview: Bay City, Michigan, Simba Mines Inc. (Accessed October 17, 2006, at <http://www.simbajamba.com/Corporate/Index.html>.)
- Simba Mines Inc., 2006b, Simba completes phase 1 exploration program: Bay City, Michigan, Simba Mines Inc. press release, April 21, 2 p.
- U.S. Census Bureau, 2008a, U.S. exports to Angola from 2003 to 2007 by 5-digit end-use code: U.S. Census Bureau, (Accessed June 20, 2008, at <http://www.census.gov/foreign-trade/statistics/product/enduse/exports/c7620.html>.)
- U.S. Census Bureau, 2008b, U.S. imports from Angola from 2003 to 2007 by 5-digit end-use code: U.S. Census Bureau, (Accessed June 20, 2008, at <http://www.census.gov/foreign-trade/statistics/product/enduse/imports/c7620.html>.)
- U.S. Department of State, 2006, Background note—Angola: U.S. Department of State, October. (Accessed October 18, 2006, at <http://www.state.gov/r/pa/ei/bgn/6619.htm>.)
- U.S. Energy Information Administration, 2007, Angola, in Country analysis brief: U.S. Energy Information Administration, January. (Accessed February 21, 2008, at <http://www.eia.doe.gov/emeu/cabs/Angola/Oil.html>.)
- World Aluminium Market, 2006, Norsk Hydro eyes aluminium production in Angola: World Aluminium Market, September 30. (Accessed February 21, 2008, at <http://www.world-aluminium-market.com/news/20060930/15.html>.)
- World Bank Group, 2006, Angola country economic memorandum—Oil, broad-based growth, and equity: World Bank Group report no. 35362-AO, October 2, 126 p.

TABLE 1
ANGOLA: PRODUCTION OF MINERAL COMMODITIES¹

Commodity		2002	2003	2004	2005	2006
INDUSTRIAL MINERALS						
Cement:^c						
Hydraulic	thousand metric tons	597 ²	700	740	1,315 ^{r,2}	1,373 ²
Clinker	do.	452 ²	480	480	500	500
Diamond ³	thousand carats	5,022 ⁴	5,700 ⁴	6,146 ^{r,5}	7,079 ^{r,5}	9,175 ^{2,5}
Granite ^c	thousand cubic meters	1,500	1,500	1,500	1,500	1,500
Marble ^c	do.	100	100	100	100	100
Salt ^c	metric tons	30,000	30,000	30,000	30,000	35,000 ²
MINERAL FUELS AND RELATED MATERIALS						
Petroleum:^c						
Crude	thousand 42-gallon barrels	329,600	321,200	383,250 ²	456,250 ²	513,560 ²
Refinery products ⁶	do.	14,000	14,000	14,000	14,000	12,600

^cEstimated; estimated data are rounded to no more than three significant digits. ^rRevised.

¹Table includes data available through November 6, 2007.

²Reported figure.

³Production was approximately 90% gem and 10% industrial grade.

⁴Does not include smuggled production.

⁵Kimberley Process Certification Scheme.

⁶Includes asphalt and bitumen.

TABLE 2
ANGOLA: STRUCTURE OF THE MINERAL INDUSTRY IN 2006

(Metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Cement		Nova Cimangola S.A. (Government, 89%, and private investors, 11%)	Luanda	1,200,000; 540,000 clinker.
Do.		Companhia de Cimento do Lobito (TecnoSecil Investimentos e Participações SARL, 51%, and Government, 49%)	City of Lobito, Benguela Province	250,000.
Diamond	thousand carats	Sociedade Mineira de Catoca Lda. (Endiama EP., 32.8%; ALROSA S.A., 32.8%; Daumonty Financing Company B.V., 18%; Odebrecht Mining Services Inc., 16.4%)	Catoca Mine, Lunda Sul Province, 36 kilometers south of Saurimo	6,500.
Do.	do.	Endiama EP., 51%; New Millenium Resources Ltd., 34%; Mombo Lda., 15%	Rio Lapi Mine, 45 kilometers northeast of Saurimo, Lunda Sul Province	240.
Do.	do.	Trans Hex Group Ltd., 35%, and Endiama EP., 40%	Fucauma Mine, northeastern Angola	120.
Do.	do.	Trans Hex Group Ltd., 32%, and Endiama EP., 40%	Luarica Mine, northeastern Angola	NA.
Do.	do.	Sociedade de Desenvolvimento Mineiro de Angola S.A.R.L. (Government, 50%, and Odebrecht Mining Services Inc., 50%)	Luzamba alluvial mine, Cuango Valley	NA.
Petroleum, refinery products	thousand 42-gallon barrels	Fina Petróleos de Angola (Total S.A., 64.1%, and Government, 34%)	Refinery, Luanda	14,600.
Steel		Chung Fong Holding Company, 51%, and Government, 49%	Relaunching of steel plant (under development)	NA.
Do.		Grupo Ferpinta of Portugal	Two pipe mills at Viana, 30 kilometers east of Luanda.	6,000

NA Not available.