



2011 Minerals Yearbook

BENIN, BURKINA FASO, AND SAO TOME E PRINCIPE

THE MINERAL INDUSTRIES OF BENIN, BURKINA FASO, AND SAO TOME E PRINCIPE

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BENIN

Mining did not play a significant role in Benin's economy. The country produced mostly industrial minerals, which included cement, clay, limestone, marble, and sand and gravel. Gold was also produced in small quantities by artisanal miners.

In 2011, Benin's exports to the United States were valued at about \$2 million compared with \$276,000 in 2010 and \$441,000 in 2009. Imports from the United States were valued at about \$618 million compared with a revised \$463 million in 2010, and \$397 million in 2009. Imports from the United States included nearly \$32.8 million of petroleum products, \$3.4 million of drilling and oilfield equipment, \$1.6 million of specialized mining equipment, \$108,000 of chemical fertilizers, \$20,000 of iron and steel products, and \$34,000 of copper (U.S. Census Bureau, 2012a, b).

Production

Data on mineral production have been estimated for 2011 and are provided in table 1.

Structure of the Mineral Industry

Cement was produced by Ciments du Benin S.A., Société des Ciments d'Onigbolo, and Société des Ciments du Benin. These companies had a combined cement production capacity of 1.6 million metric tons per year (Mt/yr) (table 2). Gold was produced by artisanal miners from gold veins near the villages of Kwatena and Tchantangou, in the Atakora Mountains in northwestern Benin, and from alluvial sediments along the Perma River and its tributaries.

Commodity Review

Mineral Fuels and Related Materials

Petroleum.—In February, *Petróleo Brasileiro S.A.* (Petrobras) acquired a 50% interest in Block 4 offshore Benin from *Compagnie Béninoise des Hydrocarbures (CBH)*. Block 4 covers an area of about 7,400 square kilometers (km²) and is located about 60 kilometers (km) off the coast of Benin. Petrobras planned to conduct a three-dimensional seismic survey across an area of 2,250 km² within the block to determine the potential of the area. CBH, which was a subsidiary of *Lusitania Petroleum*, held the remaining 50% interest in the block (*Petróleo Brasileiro S.A.*, 2011; *Petroleum Economist*, 2011).

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BURKINA FASO

The mineral sector has become a significant contributor to Burkina Faso's economy as gold has overtaken cotton as the country's main export commodity. Since the opening of the country's first commercial gold mine in 2007, revenues from the mineral sector, in the form of royalties and income taxes, increased to an estimated 1.8% in 2011 from 1% in 2010 and 0.5% in 2009. These revenues accounted for about 7% of total Government revenues in 2011. From 2007 to 2010, the total number of industrial gold mines operating in the country increased from one to six, and at least one other gold mine was expected to come online by 2013. A total of 17 companies were actively exploring for gold in the country, which suggests that gold output is likely to increase further in the near future. In addition to gold, the country was in the process of developing its first zinc mine. Amendments to law No. 0312003, which established the country's Mining Code, were also underway (*Oxford Policy Management*, 2011, p. 5, 19; *Africa Report*, The, 2012; *International Monetary Fund*, 2012, p. 15, 69; *Norton Rose*, 2012).

Burkina Faso's exports to the United States were valued at about \$3.6 million in 2011 compared with \$2.4 million in 2010 and \$2.1 million in 2009. About \$1.9 million was in gold exports. Imports from the United States were valued at about \$33.2 million compared with \$46.6 million in 2010 and \$25.8 million in 2009. These imports included nearly \$6 million of excavating machinery, about \$3 million of drilling and oilfield equipment, \$1.8 million of chemical fertilizers, and \$132,000 of iron and steel products (U.S. Census Bureau, 2012a, b).

Production

Gold production (excluding production from artisanal mining) increased by about 38.5% to 31,774 kilograms (kg) compared

with a revised 22,939 kg produced in 2010, and manganese ore production decreased by 13.3% to 49,715 metric tons (t) from 57,355 t in 2010. Mineral production data provided in table 1 for other mineral commodities produced in Burkina Faso are based on estimates.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Gold.—The Inata Mine, which was operated by Société des Mines de Bélahouro S.A., produced a total of 5,194 kg of gold during the year. As of December 31, 2011, revised measured and indicated resources at Inata were estimated to be 57.3 million metric tons (Mt) at an average grade of 1.45 grams per metric ton (g/t) gold. Processing capacity at the mine's plant was increased to 340 metric tons per hour (t/h) during the year from 287 t/h in 2010. The mine was expected to produce about 5,000 kg in 2012 (Avocet Mining plc, 2012, p. 20).

Gold production from the Kalsaka Mine decreased by 3.5% to 2,224 kg compared with 2,302 kg in 2010. The Kalsaka Mine was expected to produce between 1,900 kg and 2,200 kg in 2012. The forecasted decrease in production was based on the company's estimated processing of 1.6 Mt of ore at an average grade of about 1.4 g/t gold. The company planned to extend the mine life of the Kalsaka Mine by acquiring the Sega gold project from Orezone Gold Corp. in 2012. The Sega gold project comprised an area of 313 km² that hosted indicated mineral resources of 8.3 Mt at an average grade of 1.7 g/t gold and inferred resources of 2.9 Mt at an average grade of 1.6 g/t gold. A preliminary economic assessment for Sega was expected to be completed by May 2012 (Cluff Gold plc, 2012, p. 10–11).

At the Taparko-Boroum Mine, gold production increased by 4.2% to 4,137 kg compared with 3,971 kg in 2010. Although the mine processed lower grade ore, production increased as a result of the processing of higher volumes of milled ore. A recovery rate improvement program was underway and was expected to be completed in 2012. The program included the installation of a regrinding mill and two leach tanks, which were expected to increase recovery rates by 5%, and the installation of a mobile crusher. The company also planned to start heap-leach operations by the end of 2012. In August, Nord Gold acquired a 75.1% stake in High River Gold Mines Ltd. of Canada, which was the company that formerly operated the mine through its 90%-owned subsidiary, Société des Mines de Taparko S.A. The remaining 10% ownership in Taparko-Boroum was held by the Government (Nord Gold N.V., 2012, p. 34).

Gold production at the Youga Mine increased by 5.9% to 2,714 kg from 2,563 kg in 2010. Endeavour Mining Corp., which was the company that operated the mine, reported that as of December 31, 2011, proven and probable reserves at Youga were 7.3 Mt at a grade of 1.9 g/t gold. The mine employed 400 full-time workers and 300 contractors. Endeavour planned to carry out a comprehensive exploration campaign in 2012,

which would include the drilling of 19 targets with the objective of increasing the mine's reserves and developing additional resources within the Youga gold belt (Endeavour Mining Corp., 2012, p. 8, 11).

Semafo Inc. reported an increase in gold production at its Mana Mine of 4.5%. The mine produced 5,841 kg of gold in 2011 compared with 5,589 kg of gold in 2010. Semafo planned to commission the fourth phase of its plant expansion program by the second quarter of 2012 and to increase annual production capacity to about 9,300 kilograms per year (kg/yr) of gold by the end of 2014 (Semafo Inc., 2012, p. 12).

Production at the Essakane Mine increased significantly to 11,664 kg from 4,230 kg in 2010 mostly owing to the streamlining of the mine's processing plant, which resulted in a 15% increase in the mill's processing rate. IAMGOLD Corp., which was the company that operated the mine through its subsidiary Essakane S.A., planned to focus its exploration efforts in 2012 on known and newly identified gold anomalies in three target areas within 15 km of the mine (IAMGOLD Corp., 2012, p. 12, 16).

Nord Gold N.V. of the Netherlands was in the process of developing a new gold mine in Burkina Faso. The mine, which will be located about 100 km north of the capital city of Ouagadougou, was expected to be operational by the first half of 2013 and to produce about 2,900 kg/yr of gold. Engineering work was reportedly completed during the year, and by yearend, the first mining fleet equipment had arrived onsite (Nord Gold N.V., 2012, p. 12).

Other companies exploring for gold in the country included Australian companies Ampella Mining Ltd., Boss Resources Ltd., Drake Resources Ltd., Golden Rim Resources Ltd., Gryphon Minerals Ltd., Middle Island Resources Ltd., Mt. Isa Metals Ltd., Predictive Discovery Ltd., Vital Metals Ltd., and West African Resources Ltd.; Canadian companies Channel Resources Ltd., Goldrush Resources, Orezone Gold Corp., Riverstone Resources Inc., Search Gold Resources Inc., and Volta Resources Inc.; and the South African company GoldPlat plc.

Manganese.—The Kiere Mine, which was 100% owned by Boston, Massachusetts-based ACM Corp. through its subsidiary Metal Mass Pty. Ltd., employed 156 people. Production in 2011 was below nameplate capacity mainly as a result of problems with processing equipment. Manganese ore was reportedly shipped to Togo and Côte d'Ivoire for beneficiation and then exported to markets in China, Europe, and India for use in the steel industry. The Kiere Mine is located 110 km northeast of the city of Bobo-Dioulasso (Sama, 2011).

Zinc.—Blackthorn Resources Ltd. of Australia in joint venture with Glencore International plc of Switzerland continued with the development of the Perkoa zinc project, which is located in Sanguie Province about 120 km from Ouagadougou. A Joint Ore Reserves Committee (JORC)-compliant mineral resource estimate for Perkoa was upgraded during the year and resulted in a total for measured and indicated resources of 7.15 Mt of ore at a grade of 53.8 g/t gold, 11% zinc, and 0.16% lead. Blackthorn also held a number of exploration tenements near Perkoa, that were prospective for base metals. The Perkoa Mine was expected to be commissioned by early 2013 (Blackthorn Resources Ltd., 2012, p. 6, 10, 12).

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SAO TOME E PRINCIPE

Mining did not play a significant role in the economy of Sao Tome e Principe. Mineral production was limited to clay and volcanic rock, and information was inadequate to make reliable estimates of output for these commodities. Potential exists for the development of the country's petroleum industry. All other mineral product requirements were imported.

TABLE 1
BENIN AND BURKINA FASO: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Country and commodity	2007	2008	2009	2010	2011	
BENIN						
Cement, hydraulic	thousand metric tons	1,347 ^{r,3}	1,347 ^{r,3}	1,315 ^{r,3}	1,305 ^{r,3}	1,300
Clay		77,295 ³	77,000	77,000	77,000	77,000
Gold	kilograms	19 ³	20	20	20	20
Gravel	cubic meters	25,348 ³	25,000	25,000	25,000	25,000
Limestone	thousand metric tons	1,057 ³	1,000	1,000	1,000	1,000
Marble		342 ³	300	300	300	300
Sand	thousand cubic meters	5,500	5,500	5,500	5,500	5,500
BURKINA FASO⁴						
Cement		420,000 ^r	450,000 ^r	450,000 ^r	450,000 ^r	450,000
Dolomite	cubic meters	3,000	3,000	3,000	3,000	3,000
Gold	kilograms	2,250 ³	6,033 ^{r,3,5}	11,581 ^{r,3,5}	22,939 ^{r,3,5}	31,774 ^{3,5}
Granite	cubic meters	300,000	300,000	300,000	300,000	300,000
Manganese:						
Ore, processed		--	--	--	57,355 ^{r,3}	49,715 ^{r,3}
Mn content		--	--	--	25,800 ^r	22,400
Phosphate rock:						
Gross weight		2,400	2,400	2,400	2,400	2,400
P ₂ O ₅ content		650	650	650	650	650
Pumice and related volcanic materials		10,000	10,000	10,000	10,000	10,000
Salt		5,000	5,000	5,000	5,000	5,000
Stone, marble		100,000	100,000	100,000	100,000	100,000

^rRevised. -- Zero.

¹Estimated data are rounded to no more than three significant digits.

²Table includes data available through January 14, 2013.

³Reported figure.

⁴In addition to the commodities listed, sand and gravel and other construction materials are produced, but information is inadequate to make reliable estimates of output.

⁵Does not include production from artisanal mining, which was estimated to fluctuate between 1,600 and 5,000 kilograms per year.

TABLE 2
 BENIN AND BURKINA FASO: STRUCTURE OF THE MINERAL INDUSTRIES IN 2011

(Metric tons unless otherwise specified)

Country and commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
BENIN				
Cement		Ciments du Benin S.A. (HeidelbergCement AG, 52.51%, through its subsidiary Scancem International SA)	Cotonou plant	300,000 cement.
Do.		Onigbolo Cement Co. (OCC) (Dangote Industries Ltd., 43%, and Société des Ciments du Benin, 51%)	Onigbolo plant	600,000 cement.
Do.		Société des Ciments du Benin (Government, 50%, and LaFarge Group, 50%)	do.	700,000 cement.
BURKINA FASO				
Cement		Diamond Cement Burkina S.A. (West African Cement S.A.)	Ouagadougou	700,000.
Gold	kilograms	Société des Mines de Bélahouou S.A. (Avocet Mining plc, 90%, and Government, 10%)	Inata Mine, 220 kilometers north of Ouagadougou	5,200.
Do.	do.	Burkina Mining Company S.A. (Endeavour Mining Corp., 90%, and Government, 10%)	Youga Mine, 180 kilometers southeast of Ouagadougou	3,100.
Do.	do.	Essakane S.A. (IAMGOLD Corp., 90%, and Government, 10%)	Essakane Mine, 330 kilometers northeast of Ouagadougou	9,800.
Do.	do.	Kalsaka Mining S.A. (Cluff Gold plc, 78%; IMARB Indústria Metalúrgica, 12%; Government 10%)	Kalsaka Mine, 150 kilometers west of Ouagadougou	2,300.
Do.	do.	Semafo Burkina Faso S.A. (Semafo Inc., 90%, and Government, 10%)	Mana Mine, 200 kilometers west of Ouagadougou	5,900.
Do.	do.	Société des Mines de Taparko S.A. (Nord Gold N.V., 90%, and Government, 10%)	Taparko-Boroum Mine, 200 kilometers from Ouagadougou	4,100.
Manganese		ACM Corp. (Burkina Manganèse S.A., 100%)	Kiere Mine, 10 kilometers northeast of Bobo-Dioulasso	60,000 ore.

Do., do. Ditto.