



2012 Minerals Yearbook

**THE GAMBIA, GUINEA-BISSAU, AND SENEGAL
[ADVANCE RELEASE]**

THE MINERAL INDUSTRIES OF THE GAMBIA, GUINEA-BISSAU, AND SENEGAL

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THE GAMBIA

Mining did not play a significant role in The Gambia's economy. Mineral output was limited to the production of industrial minerals, such as clay, ilmenite, laterite, silica sand, and zircon, and the available data were inadequate to make reliable estimates of output. The Gambia did not produce petroleum and depended upon imports to meet its domestic energy requirements. Several international petroleum companies, including African Petroleum Corp. Ltd. and Texas-based CAMAC Energy Inc. explored for petroleum offshore The Gambia in 2012. African Petroleum, through its subsidiary African Petroleum Gambia Ltd., held a 60% operating interest in Blocks A1 and A4, which covered a combined surface area of 2,668 square kilometers (km²) offshore. More than 30 exploration prospects and leads had been identified in the area, and the recoverable prospective undiscovered resources were reported to be about 500 million barrels. The company planned to continue with its drilling program in 2013. CAMAC Energy held a 100% interest in petroleum exploration, development, and production licenses for offshore Blocks A2 and A5, which covered a combined surface area of 2,666 km² east of deepwater Blocks A1 and A4. CAMAC planned to conduct surveys, acquire and interpret two-dimensional and three-dimensional (3-D) seismic data, identify prospects, and drill one exploration well on each block throughout the initial 4-year exploration-phase program (Petzet, 2012; African Petroleum Corp. Ltd., 2013, p. 4, 14).

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GUINEA-BISSAU

Mineral production in Guinea-Bissau was limited to small-scale production of industrial minerals, such as clay, granite, limestone, and sand and gravel, and available data were not sufficient to estimate the level of output of these commodities. The country's prospective mineral resources included bauxite, diamond, gold, heavy minerals, petroleum, and phosphate rock. Exploration activities for bauxite and phosphate rock were ongoing in 2012. Guinea-Bissau did not produce petroleum and depended upon imports to meet its domestic energy requirements.

Commodity Review

Metals

Bauxite and Alumina.—Sociedade Mineira de Investimentos Bauxite Angola (SMIBA) continued to explore for bauxite in eastern Guinea-Bissau. The company planned to build a 3-million-metric-ton-per-year (Mt/yr) bauxite mine in the Boe region about 280 kilometers (km) east of the capital city of Bissau, a deepwater port in the city of Buba in the southwest, and a hydroelectric plant along the Corubal River. As of yearend 2012, however, no progress had been reported progress on any of these projects. SMIBA had acquired the rights for the development of the project in 2007, but owing to political instability and to the financial crisis of 2008–09, the project had been kept on hold for more than 3 years. SMIBA was 70% owned by Sociedade Nacional de Petróleos de Angola (Sonangol) and Banco Africano de Investimentos of Angola. The remaining 30% interest in the project was held by private Angolan and Guinean investors (Bauxita Angola Sociedade Mineira e Investimentos S.A., 2011; Macaclub, 2012).

Industrial Minerals

Phosphate Rock.—On November 23, Plains Creek Phosphate Corp. of Canada announced the completion of two feasibility studies for the development of the Farim phosphate rock project. The Farim project is located in north-central Guinea-Bissau about 5 km west of the town of Farim and 120 km north of the capital city of Bissau. The deposit consists of one continuous phosphate rock bed that extends across a surface area of about 40 km². Plains Creek was in the process of studying several production scenarios, which ranged from a 1- to 2-Mt/yr beneficiated phosphate rock concentrate operation to a 1.3-Mt/yr direct-shipping-ore mining operation. The updated measured resource estimate for Farim was reported to be 64.6 million metric tons (Mt) of phosphate rock ore at an average grade of 29.11% P₂O₅. The indicated resources were reported to be 28.1 Mt of phosphate rock ore at an average grade of 27.68% P₂O₅, and the inferred resources were estimated to be 18.3 Mt of phosphate rock ore at an average grade of 28.66% P₂O₅ (Plains Creek Phosphate Corp., 2012).

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SENEGAL

Senegal was among the world's leading producers of phosphate rock, which was one of the country's principal export products. Available information was not adequate to make reliable estimates of the value of these exports for 2012, however, nor the mineral commodity's contribution to the GDP. Other mineral commodities of economic importance to the country were attapulgitite and cement. Senegal also produced basalt, gold, laterite, lime, limestone, natural gas, petroleum, petroleum refinery products, salt, and sand. In 2012, Senegal's total exports to the United States were valued at about \$16.8 million compared with \$6.8 million in 2011. These exports, with the exception of gold, did not include significant quantities of mineral products. Exports of gold to the United States were valued at \$32,000 in 2012. Total imports from the United States were valued at about \$149 million compared with \$264 million in 2011; these included \$5.3 million in petroleum products, \$4.9 million in drilling and oilfield equipment, \$4.2 million in chemical fertilizers, \$1.2 million in railway transportation equipment, \$643,000 worth of specialized mining equipment, and \$153,000 worth of iron and steel products (U.S. Census Bureau, 2013a, b).

Production

Output levels for most mineral commodities increased during the year, including laterite (increased by 131%), limestone (120%), basalt (65%), gold (63%), lime (38%), and petroleum refinery products (11%). Petroleum output, on the other hand, decreased by 86% to 57,000 barrels; sand, by 14% to 1,468 metric tons (t); salt, by 8% to 237,000 t; calcium phosphate-based fertilizers, by 3% to 36,000 t; and phosphate rock, by 2% to 1.38 Mt. Data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Gold.—The Sabodala Mine, which is located within the West African Birimian gold belt about 650 km east of the capital city of Dakar, produced 6,666 kilograms (kg) of gold in 2012 compared with 4,089 kg in 2011. The increase in production was attributed to the expansion of the mine's processing plant. The Sabodala Mine produced gold dore bars containing 90% gold and 10% silver and was Senegal's only industrial gold mining operation. From 2013 and onward, the mine was expected to

produce 6,200 kilograms per year of gold owing partly to the commissioning of five new haul trucks. As of December 31, 2012, proven and probable gold reserves were reported to be 35.23 Mt at a grade of 1.4 grams per metric ton gold (Teranga Gold Corp., 2013, p. 6, 9).

Several other companies explored for gold in Senegal in 2012. These companies included Bassari Resources Ltd. and Erin Resources Ltd. of Australia; IAMGOLD Corp. and Oromin Explorations Ltd. of Canada; and Randgold Resources Ltd., Stratex International plc., and Toro Gold Ltd. of the United Kingdom.

Iron and Steel.—Testimony regarding the Government of Senegal's claim that Luxembourg-based ArcelorMittal had breached its contract to build the integrated Faleme iron ore complex was presented before the Court of Arbitration of the International Chamber of Commerce in Paris in September 2012. In early 2011, the Government and ArcelorMittal had engaged in a conciliation procedure in an attempt to reach mutually acceptable terms to solve the dispute, but the two were unable to reach an agreement. As a result, the Government requested that ArcelorMittal pay a penalty of \$750 million. A decision concerning the merits of the claim was expected in early 2013 (Skelton, 2012; ArcelorMittal, 2013, p. 162).

Titanium, Titanium Mineral Concentrates, and Zircon.—Mineral Deposits Ltd. (MDL) of Australia and ERAMET S.A. of France continued to work on the development of the Grande Côte Mineral Sands project (GCMS) through their joint-venture company TiZir Ltd. In 2011, the joint-venture partners combined MDL's 90% interest in GCMS with ERAMET's 100% interest in the Tyssedal ilmenite processing plant to create a vertically integrated titanium minerals operation in Senegal. Through the merger, MDL would secure the offtake of most of its ilmenite production from the GCMS, and ERAMET's Tyssedal plant, which was located in Norway, would receive the additional supply of high-quality ilmenite for the production of titanium slag. In 2012, the joint-venture partners invested \$271 million in the development of the project. The average annual production from the GCMS project was projected to be 575,000 t of ilmenite (including small amounts of rutile and leucosene) and 85,000 t of zircon. The partners planned to commission the project in late 2013 and to transport the ore by rail to the Dakar Port (Mineral Deposits Ltd., 2013, p. 11–13).

Industrial Minerals

Cement.—Senegal produced 4.7 Mt of cement in 2012, which was about the same level as that produced in 2011. Les Ciments du Sahel S.A. and Sococim Industries were the only two companies that produced cement in the country, and their joint production far exceeded domestic demand. Senegal's cement surplus was exported to neighboring countries, in particular to Mali, and production was expected to increase even more (by 1.5 Mt/yr) following the commissioning of a new cement plant to be developed by Dangote Cement plc of Nigeria. The development of the plant, however, was put on hold in 2012 following a dispute regarding the land rights to the property where the plant was to be constructed. Sinoma International Engineering Co. Ltd. of China, which was the

company that built Dangote's 6-Mt/yr Ibese cement plant in Nigeria, was the company contracted to build the plant. Dangote Group held a 90% interest in the project through Dangote Industries Senegal S.A. (Dangote Cement plc, 2012; 2013, p. 18–19, 91).

Sococim Industries, which was owned by Vicat Group of France, reported that although national elections in Senegal in 2012 had delayed major infrastructure projects, the company's domestic sales volume of cement reached about 2.7 Mt and export sales increased by 3.8%. Sococim's clinker production increased by 5.5% to 1.772 Mt from 1.679 Mt in 2011, and its cement production increased by 1.5% to 2.688 Mt from 2.648 Mt. During the year, the company restarted kiln No. 3, which had been idle since 2008 (Vicat Group, 2013, p. 28, 45).

Mineral Fuels

Petroleum.—African Petroleum Corp. of Australia through its subsidiary African Petroleum Senegal Ltd. held a 90% interest in the Rufisque Offshore Profond (ROP) and the Senegal Offshore Sud Profond (SOSP) Blocks offshore southern and central Senegal, respectively. African Petroleum's 2012 exploration activities offshore Senegal included the completion of a 3–D seismic survey of 3,600 km² on the SOSP Block and the reprocessing of 3–D seismic survey data for 1,500 km² of the ROP Block. The final 3–D data for the SOSP Block were due in March 2013, and the final interpretation of the reprocessed data for the ROP Block was expected to be completed during the third or fourth quarter of 2013 (African Petroleum Corp. Ltd., 2013, p. 4, 16, 87).

Ophir Energy plc of the United Kingdom reported that it had plugged and abandoned the Kora-1 well, which was the first well drilled on the AGC Profond Block. The well had been drilled to a total depth of 4,447.5 meters in July 2011, but a technical assessment conducted in 2012 revealed a predominantly claystone and thinly bedded limestone sequence rather than the sandstone reservoir facies that Ophir had anticipated. The well reportedly yielded valuable information on the potential of the block, however, and the company decided to continue to integrate the well results with existing seismic datasets to characterize the block's potential. The assessment of the data was expected to be completed during 2013. Ophir held a 44.2% operating interest in the AGC Profond Block in joint venture with Noble Energy Inc. of Houston, Texas, which held a 30% nonoperating working interest; FAR Ltd. of Australia, which held 8.8% interest; and Rocksource ASA of Norway, which held a 5.0% interest. The Government, through L'Entreprise AGC S.A., had a 12% carried participating interest in the block and the option to increase its participating interest by a maximum of 5%. On December 31, 2012, Noble Energy and Rocksource decided to relinquish their respective participating interests in the block to Ophir. The transfers were

pending Government approval (Noble Energy Inc., 2013, p. 7, 16, 82; Ophir Energy plc, 2013, p. 30).

Société Africaine de Raffinage, which began operating in 1963, was the country's only petroleum refinery. The refinery had a production capacity of about 27,000 barrels per day and employed 243 people. It produced butane, diesel, gasoline, gas oil, kerosene, and fuel oil for domestic consumption. The refinery was owned by Société des Petroles du Sénégal (46%), Saudi Binladin Group of Saudi Arabia (34%), and Total S.A. of France (20%) (Société Africaine de Raffinage, 2012).

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

(Thousand metric tons unless otherwise specified)

Commodity ³		2008	2009	2010	2011	2012
Basalt ⁴	metric tons	1,037	1,321	1,167	1,415	2,328
Cement, hydraulic		3,084	3,320	4,066	4,677	4,689
Clays, fuller's earth (attapulgitite)		167	181	204	181 ^r	181 ^e
Gold, mine output, Au content	kilograms	600 ⁵	5,055	4,381	4,089	6,666
Laterite ⁴	metric tons	71	103	226	1,035	2,386
Lime		82	46	24	26	36
Limestone ⁴	metric tons	1,025	1,415	1,248	1,093	2,407
Natural gas ^e	thousand cubic meters	7,000	17,500	24,000	36,000	36,000 ^e
Petroleum: ⁶						
Crude oil	thousand 42-gallon barrels	99	249	398	403	57
Refinery products		896	739	617	738	818
Phosphate rock and related products:						
Phosphate rock		645	949	1,079	1,411	1,381
Phosphoric acid, P ₂ O ₅ content		180	283	312	362	363
Calcium phosphate-based fertilizers		50	44	45	37	36
Salt		241	222	232	258	237
Sand ⁴	metric tons	6,421	2,065	2,040	1,706	1,468

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

¹Table includes data available through December 19, 2013.

²In addition to the commodities listed, Senegal also produced sand and gravel, stone for local construction purposes, and silver, but information is inadequate to make reliable estimates of output.

³Major source of information: Agence National de la Statistique et de la Démographie.

⁴Values converted from cubic meters to metric tons. Specific gravity, in grams per cubic meter—basalt, 2.8; laterite, 2.55; limestone, 2.6; and sand, 2.6.

⁵Government estimate of unreported production of artisanal gold.

⁶Crude petroleum values have been converted from metric tons to 42-gallon barrels using a conversion factor of 7.4 barrels of crude petroleum per metric ton.

TABLE 2
SENEGAL: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Attapulgitite		Senegal Mines SA (Sepiol SA, 51%, and Government, 49%)	240 kilometers south of Dakar	100.
Do.		Société Senegalaise de Phosphates de Thies S.A.	Lam Lam	NA.
Cement		Les Ciments du Sahel S.A.	Kirene plant	2,400.
Do.		Sococim Industries (Vicat Group 100%)	Rufisque, east of Dakar	3,500.
Gold	kilograms	Sabodala Gold Operations S.A. (Teranga Gold Corp., 90%, and Government, 10%)	650 kilometers east of Dakar	6,700.
Petroleum products	thousand 42-gallon barrels per day	Société Africaine de Raffinage (Société des Petroles du Senegal, 46%; Saudi Binladin Group, 34%; and Total S.A., 20%)	Refinery, 23 kilometers from Dakar	27.
Phosphate rock, aluminum		Société Senegalaise de Phosphates de Thies S.A.	Lam Lam, Sebikhotane, and Allou-Kagne	NA.
Phosphate rock, calcium		Industries Chimiques du Sénégal Group (Archean Group, Government of India, and Indian Farmers Fertilizer Cooperative Ltd., 85%; and Government of Senegal, 15%)	Taiba Mine, 100 kilometers from Dakar	2,000.
Phosphoric acid		Industries Chimiques du Sénégal Group (Indian Farmers Fertilizer Cooperative Ltd., 85%, and Government, 15%)	Darou I plant and Darou II plant, 100 kilometers from Dakar	660 P ₂ O ₅ .

Do. Ditto. NA Not available.