



2014 Minerals Yearbook

SENEGAL

THE MINERAL INDUSTRY OF SENEGAL

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Senegal ranked among the world's leading producers of attapulgite. In 2014, the mineral sector accounted for only 1.9% of the country's gross domestic product (GDP). GDP growth in 2014, which was estimated to be 4.5%, was driven mostly by the services sector, which accounted for 62% of real GDP. Mineral commodities produced in the country included basalt, cement, clays, gold, gravel, laterite, lead (refined), lime, limestone, mineral sands, natural gas, petroleum (crude), petroleum refinery products, phosphate rock, salt, sand, and silver. Senegal's mineral sector was regulated by law No. 2003–36 of February 2004 (Gassama and others, 2015).

Production

Output levels for most mineral commodities decreased during the year. Cement production decreased by 5.6% to 4.9 million metric tons (Mt); attapulgite, by 18.6% to 191,000 metric tons (t); refined lead, by 16.1% to 2,187 t; lime, by 26.7% to 11,000 t; petroleum refinery products, by 32.6% to 506,000 t; phosphate rock, by 8.7% to 806,000 t; and phosphoric acid, by 23.2% to 199,000 t. Gold production increased by 2.2% to 6,588 kilograms (kg); crude petroleum, by 63.9% to 192,000 barrels; phosphate-based fertilizers, by 219% to 83,000 t; and salt, by less than 1% to 245,000 t. In 2014, production of basalt, laterite, limestone, sand, and silver was estimated. Production of ilmenite, rutile, and zirconium concentrates started in 2014. Data on mineral production are in table 1.

Structure of the Mineral Industry

The majority of the mining operations in Senegal were privately owned. The Government held a minority participating interest in most operations. Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Gold.—Teranga Gold Corp. of Canada, through its subsidiary Sabodala Gold Operations S.A., mined gold from the Sabodala Mine and from the Oromin Joint Venture Group (OJVG) project. In 2014, Teranga produced a total 6,588 kg of gold from the Sabodala Mine and the OJVG Masato deposit. The increase in production was partly attributed to the processing of higher grade ore and improved mill throughput at Sabodala and new production from the commissioning of the Masato deposit in the fourth quarter of 2014. Teranga's mining license for the Sabodala Mine was set to expire on April 30, 2017; however, an agreement signed with the Government on May 31, 2013, extended the company's mining rights to 2022. Teranga acquired a 100% interest in the nongovernment-owned equity in the project by purchasing British Virgin Islands-based Bendon

International Ltd.'s 43.5% participating interest in OJVG for \$105 million and United Kingdom-based Badr Investment Ltd.'s 13% carried interest for \$7.5 million (Teranga Gold Corp., 2015a, p. 15–16, 21).

The Masato deposit, which was the first of the OJVG deposits to be developed, was commissioned in September. The company planned to commission a second deposit (Gora) in the third quarter of 2015. Teranga also explored for gold in Senegal through two other subsidiaries—Société des Mines de Golouma S.A., which held interest in the Golouma mining concession, and Sabodala Mining Company SARL, which held interest in nine exploration licenses. Teranga was in negotiations with the Government to consolidate all its mining concessions in Senegal into one single license, which would grant the company the right to mine and explore for gold in the country through Sabodala Gold Operations S.A. Teranga planned to produce between 6,200 kilograms per year (kg/yr) and 7,200 kg/yr of gold from Senegal operations in 2015, and to further ramp up production to between 7,800 kg/yr and 10,900 kg/yr thereafter (Teranga Gold Corp., 2015a, 16; 2015b, p. 3, 5–6, 14–16).

Several other companies explored for gold in Senegal in 2014. These companies included Bassari Resources Ltd. and Erin Resources Ltd. of Australia; and IAMGOLD Corp., Randgold Resources Ltd., Stratex International plc., and Toro Gold Ltd. of the United Kingdom.

Iron and Steel.—The Faleme iron ore project remained on hold in 2014 pending the resolution of a dispute between the Government and Luxembourg-based ArcelorMittal Holdings AG regarding ArcelorMittal's contractual obligations. In September 2013, an arbitral tribunal within the Court of Arbitration of the International Chamber of Commerce in Paris had ruled in favor of the Government of Senegal, which claimed that ArcelorMittal had breached its contractual obligations for the development of the Faleme project. At the time, a new arbitration phase to determine the potential liability of ArcelorMittal was scheduled for late 2015, but in 2014, ArcelorMittal announced that the parties had engaged in a conciliation procedure and had reached an agreement. A procedural order formally closing the arbitration was issued by the arbitral tribunal on December 12 (ArcelorMittal S.A., 2014, p. 32, 143; 2015, p. 260).

Titanium, Titanium Mineral Concentrates, and Zirconium.—The Grande Côte Mineral Sands (GCO) Mine, which was operated by Mineral Deposits Ltd. (MDL) of Australia and ERAMET Group of France through their joint-venture company TiZir Ltd., was commissioned during the year. The GCO operation consisted of a coastal mobile dune system that stretches 100 kilometers (km) along Senegal's coast line about 50 km northeast of the capital city of Dakar. Dredging operations at GCO began in March, and operations at the processing facility began in June. In 2014, GCO produced 100,590 t of ilmenite concentrate, 9,040 t of zircon concentrate,

and 663 t of leucoxene and rutile concentrate. At nameplate capacity, the mine was expected to produce an average of 575,000 metric tons per year (t/yr) of ilmenite concentrate; 85,000 t/yr of zircon concentrate; 10,000 t/yr of leucoxene concentrate; and 6,000 t/yr of rutile concentrate (Mineral Deposits Ltd., 2015, p. 3–4, 6).

Production of ilmenite concentrates from the GCO Mine would be transported by rail to the Port of Dakar and then shipped to the Tyssedal smelter in Norway for the production of high-purity pig iron and titanium slag. Titanium slag was to be sold as a feedstock for the production of titanium dioxide pigments. The high-purity pig iron co-product recovered from the smelting process was to be sold to foundry operators. MDL expected operations to ramp up to full nameplate capacity during the third quarter of 2015. As of December 31, the GCO Mine employed a total of 923 people, 92% of whom were Senegalese nationals (Mineral Deposits Ltd., 2015, p. 7, 12, 13).

Industrial Minerals

Cement.—In December, Dangote Cement plc of Nigeria, through its subsidiary Dangote Industries Senegal S.A., commissioned a 1.5-million-metric-ton-per-year (Mt/yr) cement plant in the town of Pout, which is located about 29 km from Dakar. Dangote planned to export cement to neighboring countries, in particular to Mali, Liberia, and Sierra Leone, where it would open bulk cement import and bagging facilities. With the commissioning of the Pout cement plant, the domestic supply of cement in Senegal was expected to far exceed demand, which was estimated to be about 3 Mt/yr. Dangote's decision to invest in Senegal's oversupplied cement industry was partly based on its plans to export not only higher quality cement to countries within the West African Economic and Monetary Union but also to export the cement at a competitive price by sourcing limestone from within Senegal. Limestone is an important raw material needed for the manufacturing of cement, and its availability within West Africa is limited. Senegal's limestone reserves were estimated to be 300 Mt. The Pout cement plant was built at a cost of \$310 million (Dangote Cement plc, 2015, p. 17, 37).

Mineral Fuels

Petroleum.—Based on monthly data reported by Senegal's National Statistics Agency, Senegal produced small amounts of crude petroleum in 2014. Available information, however, was inadequate to determine the source of such production, as reported data from Société des Petroles du Senegal (Petrosen) indicated that crude petroleum production from the Diam Nadio hydrocarbon field had ceased in 1999. Petrosen was Senegal's national petroleum company (Société des Petroles du Sénégal, 2015).

During the year, Scotland-based Cairn Energy plc announced the discovery of petroleum in the FAN-1 exploration well, which is located within the Sangomar Deep Block about 100 km offshore Senegal, and in the SNE-1 exploration well, which is located within the Sangomar Offshore Block about 24 km southeast of FAN-1. Cairn planned to conduct an appraisal of

both wells in 2015. The company held a 40% operating interest in Senegal's Sangomar Deep, Sangomar Offshore, and Rufisque Blocks in partnership with Texas-based ConocoPhillips Co. (35%), Australia-based FAR Ltd. (15%), and Petrosen (10%) (Cairn Energy plc, 2015, p. 13, 24).

African Petroleum Corp. Ltd. of Australia, through its subsidiary African Petroleum Senegal Ltd., held a 90% operating interest in the Rufisque Offshore Profond (ROP) and the Senegal Offshore Sud Profond (SOSP) Blocks in southern and central Senegal, respectively. Petrosen held a 10% interest in the ROP and SOSP Blocks. In 2014, African Petroleum continued to work on the interpretation of 3,600 square kilometers (km²) of three-dimensional (3-D) seismic data for the SOSP Block. The company also reported completing the reprocessing of 1,800 km² of 3-D seismic survey data for the ROP Block during the fourth quarter of 2014, the interpretation of which was underway as of yearend (African Petroleum Corp. Ltd., 2015, p. 3, 13).

In August 2014, Texas-based Kosmos Energy Ltd. acquired a 60% operating interest in the Cayar Offshore Profond (COP) and the St. Louis Offshore Profond (SLOP) Blocks. Kosmos explored for petroleum in these blocks in partnership with Timis Corp. Ltd., through its subsidiary Petro-Tim Ltd., which held a 30% participating interest. The Government, through Petrosen, held a 10% interest in the blocks. Kosmos was to cover the full exploration costs to drill a well in each block for a maximum of \$120 million per well and to increase its participating interest to 65% contingent upon it undertaking the full costs of drilling a third well at a cost of \$120 million. A 7,000-km² 3-D seismic survey for the two blocks was launched in September 2014 (Kosmos Energy Ltd., 2015, p. 15, 18, 33).

Société Africaine de Raffinage (SAR) was the country's only petroleum refinery. The refinery produced butane, diesel, gasoline, gas oil, kerosene, and fuel oil from imported crude petroleum, mostly from Nigeria. The Government had considered closing the plant—which has been in operation since the 1960s—and converting it into an import and storage terminal, but in 2014, Petrosen and its joint-venture partners secured a \$350 million loan to finance imports of crude petroleum and continued its operation. The recent discovery of petroleum offshore Senegal, however, would likely increase the prospects of allocating resources in the future to keep the refinery operational. The SAR refinery was owned by Petrosen (46%), Saudi Binladin Group of Saudi Arabia (34%), and Total S.A. of France (20%) (Ba and Farge, 2014; Société Africaine de Raffinage, 2015).

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TABLE 1
SENEGAL: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ^{2,3}	2010	2011	2012	2013	2014
Basalt ⁴	1,167	1,415	2,328	3,791 ^r	3,800 ^e
Cement, hydraulic	4,066	4,677	4,689	5,191	4,899
Clay, fuller's earth (attapulgitite)	204	181	180 ^{r,e}	235	191
Gold, mine output, Au content kilograms	4,381	4,089	6,666	6,445	6,588
Laterite ⁴	226	1,035	2,386	682 ^r	700 ^e
Lead, secondary ⁵ metric tons	-- ^r	-- ^r	2,385 ^r	2,607	2,187
Lime	24	26	36	15 ^r	11
Limestone ⁴	1,248	1,093	2,407	1,681 ^r	1,700 ^e
Natural gas ^e thousand cubic meters	24,000	36,000	--	--	--
Petroleum: ⁶					
Crude oil thousand 42-gallon barrels	398	403	57	117	192
Refinery products	617	738	818	751	506
Phosphate rock and related products:					
Phosphate rock	1,079	1,411	1,381	882	806
Phosphoric acid, P ₂ O ₅ content	312	362	363	259	199
Phosphate-based fertilizers	45	37	36	26	83
Salt	232	258	237	243	245
Sand ⁴	2,040	1,706	1,468	1,500 ^e	1,500 ^e
Silver kilograms	576	539	670	898	900 ^e
Titanium:					
Ilmenite concentrate metric tons	--	--	--	--	100,590
Leucoxene and rutile concentrate do.	--	--	--	--	663
Zirconium, zircon concentrate do.	--	--	--	--	9,040

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

¹Table includes data available through December 8, 2015.

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

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

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

⁵Reported data are for fiscal year beginning on March 31 of the year indicated.

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 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of mine facilities	Annual capacity
Attapulгите		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, Thies region	NA.
Basalt		Various quarries	Ngoundiane, Thies region	NA.
Cement		Les Ciments du Sahel S.A.	Kirene plant, Kirene, east of Dakar	2,400.
Do.		Sococim Industries (Vicat Group, 100%)	Rufisque cement plant, east of Dakar	3,500.
Do.		Dangote Cement Senegal S.A. (Dangote Cement plc, 90%)	City of Pout, 29 kilometers from Dakar	1,500.
Gold	kilograms	Sabodala Gold Operations S.A. (Teranga Gold Corp., 90%, and Government, 10%)	Sabodala Mine, 650 kilometers east of Dakar	6,500.
Do.	do.	Oromin Joint Venture Group, 90% (Teranga Gold Corp., 90%, and Government, 10%)	Masato deposit, 600 kilometers southeast of Dakar	500.
Lead	metric tons	Gravita Senegal SAU (Gravita India Ltd., 100%)	Recycling lead-acid battery plant, Dakar	3,800.
Petroleum products	thousand 42-gallon barrels per day	Société Africaine de Raffinage (Société des Petroles du Senegal, 46%; Saudi Binladin Group, 34%; Total S.A., 20%)	SAR refinery, 23 kilometers from Dakar	25,000.
Phosphate rock		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.
Phosphate rock, aluminum		Société Senegalaise de Phosphates de Thies SA	Lam Lam, Sebikhotane, and Allou-Kagne	NA.
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 ₃ .
Salt		Société des Salins du Sine Saloum	Salt marshes, Saloum River	230.
Titanium minerals:				
Ilmenite concentrate	metric tons	TiZir Ltd., 90% (Mineral Deposits Ltd., 50%, and Eramet Group, 50%)	Grande Côte Mine, 50 kilometers northeast of Dakar	575.
Leucoxene and rutile concentrate	do.	do.	do.	16.
Zirconium, zircon concentrate	do.	do.	do.	85.

Do., do. Ditto. NA Not available.