



2009 Minerals Yearbook

MAURITANIA

THE MINERAL INDUSTRY OF MAURITANIA

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Mauritania produced copper, crude oil, gold, and iron ore, as well as modest quantities of cement, gypsum, and salt. In 2009, it was the 2d ranked producer of iron ore in Africa after South Africa and 15th in the world in terms of the volume produced. Mauritania took steps towards increased political stability in 2009. The Transitional National Unity Government, which was formed in June, held presidential elections in July, and the country inaugurated a new President in August. Soon thereafter, the World Bank and the International Monetary Fund reactivated their development programs, which had been suspended in 2008 following the coup (Jorgenson, 2010; U.S. Department of State, 2010).

Minerals in the National Economy

In 2009, the value of Mauritania's total exports of goods decreased by 23% to \$1,359 million from \$1,788 million in 2008. The value of iron ore exports (38% of total exports) decreased by about 37% to about \$522 million from \$823 million in 2008. In terms of tonnage, iron ore exports decreased by about 6% to 10.3 million metric tons (Mt) from 10.9 Mt in 2008. The decrease was attributable to the slowdown in the global economy. The value of gold exports (about 17% of total exports) increased by about 36% to \$228 million from about \$167 million in 2008; crude oil exports (16% of total exports) decreased by 33% to \$218 million from about \$326 million in 2008; and copper exports (about 9% of total exports) decreased by 29% to about \$119 million from \$167 million in 2008. The decrease in the value of copper exports, despite a 12% increase in volume in 2009, was attributed to lower world copper prices. The destinations of Mauritania's iron ore exports were China (about 60%), Italy (15%), France and Germany (12% each), and the United Kingdom (1%). The year 2009 was the first year in which Mauritania's iron ore exports to China (which totaled 6.1 Mt) exceeded that exported to Europe (4.2 Mt) (Arab Steel, 2010; Banque Centrale de Mauritanie, 2010, p. 44, 50, 118).

Production

In 2009, the volume of gold production increased by 37%; copper, by 12%; and cement, by 5% compared with that of 2008. Notable decreases in output included that of salt, by 20%; gypsum, by 17%; crude oil, by 7%; and iron ore, by 6% compared with that of 2008 (table 1).

Structure of the Mineral Industry

The Ministère de l'Industrie et des Mines [Ministry of Industry and Mines] and the Ministère du Pétrole et de l'Énergie [Ministry of Petroleum and Energy] were the Government agencies responsible for regulating mineral industry activity. The Direction des Mines et de la Géologie [Department of

Mines and Geology] implemented the Government policies to enhance foreign investment in the mining sector of Mauritania. The mining laws exempted mining companies from customs duties for exploration during the first 5 years of production and permanently on fuel and spare parts. The tax code included a 25% corporate income tax rate after a tax exemption for the first 3 years of production; a tax withholding rate of 14% on repatriated earnings; a 16% value-added tax; and royalties that ranged from 1.5% to 5% depending on the value of the product. L'Unité du Cadastre Minier (the Mining Cadastre Unit) managed the exploration licensing and mining rights issuance process by offering four classes of titles: reconnaissance licenses, 3-year exploration permits, small-scale mining permits, and 30-year mining licenses (Ministry of Industry and Mines, 2008, p. 10-11).

In 2009, the mining laws were modified to give the Government the right to a 10% free-carried interest in any company that was awarded a new mining license. A mining license could be held only by a Mauritania-registered company. The Government also had the option to acquire a further 10% paid interest in the operating company, although the law was vague on how this would operate in practice (Sphere Minerals Ltd., 2010).

Société Nationale Industrielle et Minière (SNIM) was a majority state-owned mining company (78% interest) that operated iron ore mines at Guelb el Aouj, Guelb el Rhein, M'Haoudat, and Zouerate in northern Mauritania. SNIM also owned and operated a 700-kilometer (km) heavy haul railway and a shipping terminal at Nouadhibou Port on the coast of the Atlantic Ocean. Tasiast Mauritanie Ltd. S.A., which was a wholly owned subsidiary of Red Back Mining Inc. of Canada, and Mauritanian Copper Mines S.A., which was a wholly owned subsidiary of First Quantum Minerals Ltd. of Australia, were the two companies that produced gold in Mauritania in 2009. Mauritanian Copper Mines produced copper and Petroleum Nasional Berhad (Petronas) was the country's only producer of crude oil from the Changuitti offshore field. Other mineral production companies included Ciment de Mauritanie and Mauritano-Française des Ciments S.A., which produced cement, and Société Mauritanienne des Industries du Sel (SOMISEL), which produced salt (table 2).

Commodity Review

Metals

Copper.—The Guelb Moghrein Mine, which was an open pit mine located near Akjouj about 250 km northeast of Nouakchott, was 100% owned and operated by Mauritanian Copper Mines. The company produced 37,000 metric tons (t) of copper in concentrate in 2009, which was a 12% increase from the 33,073 t produced in 2008. The mine employed 1,051 workers and, as of 2009 yearend, it had a remaining life of 7.5 years. Mauritanian Copper Mines increased the mining rate

to 3.8 million metric tons per year (Mt/yr) at a 3:1 strip ratio (waste/ore) from 3.2 Mt/yr in 2008. The expansion allowed for the processing of lower grade ore, which, in turn, increased the reserves at the mine. The 2009 yearend estimates of copper reserves at the Guelb Moghrein Mine were about 20.0 Mt of proven reserves and 9.6 Mt of probable reserves with a cutoff grade of 1.23% and 1.31% copper, respectively (First Quantum Minerals Ltd., 2010).

Gold.—Red Back's holdings in Mauritania comprised three permits that covered 16,222 square kilometers (km²), including the Ahmeyim-Tijirit, the Karet, and the Tasiast permits. The Tasiast gold mine produced 3,932 kilograms (kg) of gold in its first full year of production in 2006; 3,943 kg of gold in 2007; 3,745 kg of gold in 2008; and 5,686 kg of gold in 2009. Estimates of total ore reserves at the Tasiast deposit were 115.2 Mt at a grade of 1.35 grams per metric ton (g/t) gold, or 155,930 kg of gold (5.03 million troy ounces). The proved reserves included 49.4 Mt of gold at a grade of 1.36 g/t gold, probable reserves were 61.5 Mt at a grade of 1.40 g/t of gold, and stockpile reserves were 4.3 Mt at a grade of 0.68 g/t gold (Red Back Mining Inc., 2010).

Mauritanian Copper Mines produced 2,894 kg of gold at the Guelb Moghrein copper-gold mine in 2009 compared with 1,920 kg in 2008. As of yearend 2009, updated mineral reserves were about 2.0 Mt of proved ore reserves grading 0.85 g/t gold and 9.6 Mt of probable ore reserves grading 0.99 g/t gold (First Quantum Minerals Ltd., 2010).

Shield Mining reported results from its drilling and soil sampling programs at the Tijirit gold prospect, which is located 35 kilometers (km) southeast of the Tasiast gold mine. The company identified a broad zone of low-grade gold mineralization that was parallel to the Tasiast belt and associated with the banded iron formations. The better results included 30 meters (m) of mineralization grading 0.9 g/t gold and 38 m of mineralization grading 0.75 g/t gold at the Lily prospect in the Tijirit project area. Shield Mining planned a followup study at Tijirit in 2010, as well as an aerial gravity survey of the Akjoujt copper-gold license area (EL448), which was 100% owned by the company and located 33 km southwest of the Guelb Moghrein copper-gold mine (Shield Mining Ltd., 2010a, p. 3; 2010b, p. 1-2).

Iron Ore.—The volume of iron ore produced by SNIM was 10.3 Mt of iron ore in 2009, which was a decrease of 6% and 13% compared with that of 2008 and 2007, respectively. SNIM expected a rebound in production to 11.4 Mt/yr in 2010 because of increased demand of the international market. The company had set a target of 12 Mt/yr of iron ore exports for 2011. SNIM arranged for \$710 million in loans from international financial institutions, including a \$175 million loan from the African Development Bank, to achieve its goal of increasing its production capacity from its three mining centers in the Zouérate region of Northern Mauritania by 4 Mt/yr. The financing would cover the cost of the expansion of the existing mines (the Guleb el Rhein, the Kedia d'Idjill Mine, and the M'Haoudat Mine) and the construction of a new beneficiation plant at the Guelb el Rhein Mine in the Zourate area that would produce 4 Mt/yr of concentrated iron ore. The loans would also pay for a new ore-carrier port at Nouadhibou,

which would be located 500 m south of the existing port, to enable handling of 170,000-t-capacity ships in the first phase and 250,000-t-capacity ships in the second phase, as well as for upgrading the 700-km iron ore railway between the mines and the port (African Development Bank, 2009; Arab Steel, 2009, 2010).

In December, Sphere Investments Ltd. of Australia changed its name to Sphere Minerals Ltd. The company had been developing iron ore resources in Mauritania for more than 10 years. Sphere was a 50-50 partner with SNIM in the joint venture of El Aouj Mining Co. S.A. to develop the Guelb el Aouj deposit and had been developing the mineral resources of the Lebtheinia iron ore project and the EL172 Sinter Feed Blend project, which was also known as the Askaf project. Sphere was the sole owner of both the Lebtheinia and the Askaf permits. The company set an overall exploration target from the Guelb el Aouj and Askaf deposits of 1,830 to 2,550 Mt grading 40% to 46% Davis Tube mass recovery and 68% to 71% Davis Tube concentrate Fe (Sphere Minerals Ltd., 2010).

The results of a definitive feasibility study for the Guelb el Aouj project, which was conducted by SNC-Lavalin International Inc. of Canada, supported establishing an open pit iron ore mine and building a pellet plant at the site of the Guelb el Aouj East project. The envisaged plant would have the capacity to produce 7 Mt/yr of direct-reduced iron (DRI) for 30 years by processing 17 Mt/yr of magnetite-quartzite primary crusher feed. In 2009, SNIM and Sphere jointly selected UBS Investment Bank of Switzerland to find a third partner in the project that would hold 51% equity and be technically capable of executing the project (Sphere Investments Ltd., 2009, p. 4).

In October, Sphere updated the mineral resources for the Lebtheinia Iron ore project, which is located east of the country's iron ore port at Nouadhibou and 48 km south of the iron ore railway that was operated by SNIM. The total mineral resources at the Lebtheinia Center deposit were 2,742 Mt grading 32.2% iron, of which 2,179 Mt grading 32.3% iron was indicated resources and 563 Mt grading 31.8% iron was inferred resources. The inferred resources included 209 Mt grading 30.7% iron from the lower oxidized zone. The company announced exploration targets of 250 to 500 Mt grading 34% to 37% iron at the Akhdar deposit and 80 to 150 Mt grading 34% to 37% iron at the Abiad deposit of the Askaf project area (EL172). Sphere planned to produce between 3 and 5 Mt/yr of direct shipping ore (DSO) sinter feed blend and pellet feed at Askaf. The company began a 9,500-m followup drilling program, as well as metallurgical testing to be completed by the end of June 2010 to determine the production level and product type at Askaf (Sphere Minerals Ltd., 2010).

Mineral Fuels and Related Materials

Petroleum.—According to the U.S. Energy Information Administration, Mauritania's crude oil production averaged 16,510 barrels per day (bbl/d) and consumption was 20,000 bbl/d in 2009. Exploration operations were carried out by state-owned Société Mauritanienne des Hydrocarbures (SMH), as well as by several international oil companies. The companies that had active crude oil or natural gas exploration projects

in onshore or offshore blocks in Mauritania in 2009 included Baraka Petroleum Ltd. of Australia, CNPCIM (a subsidiary of China National Petroleum Co.), Dana Petroleum plc of the United Kingdom, IPG Oil Ltd. of the United States; Petronas, Repsol YPF E & P of Spain, Total S.A. of France, Tullow Oil plc of the United Kingdom, Wintershal AG of Germany, and Zaver Petroleum Corp. Ltd. of Pakistan (Ministère du Pétrole et de l'Énergie, 2009).

Uranium.—In 2009, four companies prospected for uranium in Mauritania. They included Aura Energy Ltd. and Forte Energy N.L. (both of Australia), Mauritania Ventures Ltd. (a subsidiary of Alba Mineral Resources plc of the United Kingdom), and Shield Mining Ltd. of Australia.

Forte Energy, which held seven exploration licenses that covered 8,103 km² in the Zedens region in northern Mauritania, conducted vehicle-based radiometric surveys and very-low-frequency electromagnetic surveys at the Bir En Nar prospect and at several anomalies identified near Bir Moghrein. The company began a 6,000-m direct drilling program for 300 holes over 14 prospects in August to delineate an initial Joint Ore Reserves Committee (JORC)-compliant resource at the Bir En Nar permit and planned a 2,000-m reverse circulation drilling program to test several targets at the Bir Moghrein permit (Australia's Paydirt, 2010, p. 32).

In October, Forte announced results from a geophysical survey of nine targets at Bir En Nar and Bir Moghrein and declared four priority targets to be at drill-ready stage. In addition, new radiometric airborne surveys were scheduled to commence in November. Forte and Areva N.C. of France agreed to establish a joint venture to produce uranium in Mauritania as soon as Forte verifies the presence of at least 27,000 to 36,000 t of uranium from its nine uranium exploration permits (Forte Energy N.L., 2009; Australia's Paydirt, 2010).

Aura Energy explored for uranium at two locations in Mauritania—the Reguibat Craton, which is located in northern Mauritania, and the Fai, which is located in central Mauritania. Aura Energy held 10 uranium exploration permits in Mauritania. The company held 100% interest in three permits and 70% interest in two joint ventures with CGM Resources (five permits) and Ghazal Minerals (two permits). Aura completed a 392-hole drill program and verified the presence of 2-m to 4-m thick layers of uranium mineralization within 6 m of the surface. Aura planned to perform additional drilling in 2010 (Aura Energy Ltd., 2010, p. 4).

Outlook

The future of Mauritania's mineral industry shows potential for expansion because the new Government was able to receive a commitment of more than \$3 billion from international donors to carry on 187 development projects. Gold production is expected to increase in the next 5 years following the acquisition of Red Back Mining by Kinross Gold Corp. of Canada for \$7.1 billion, which accelerated the exploration program at the Tasiast deposit. Copper and gold production are expected to increase from the Akjoujt, the Sabussiri, and the Tirijit exploration projects following the acquisition of Shield Minerals by Gryphon Minerals Ltd. of Australia in 2010. Uranium

production in Mauritania could commence in 2012. The prospect of establishing large-scale iron and steel production plants at Sphere's Askaf, Guelb el Aouj, and Lebtheinia projects was enhanced by the bid by Xstrata plc of Switzerland to buy Sphere in 2010. Mauritania's capacity to export iron ore is expected to increase significantly when the construction of a second loading wharf at the port of Nouadhibou on the Atlantic coast is completed in 2012 (Avery, 2010, p. 5; Muhammad, 2010).

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TABLE 1
MAURITANIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²		2005	2006	2007	2008	2009
METALS						
Copper in concentrate		--	5,031	31,956	33,073	37,000
Gold	kilograms	--	322	2,251	6,254	8,580
Iron ore:						
Gross weight	thousand metric tons	11,133	10,658	11,817	10,950	10,275
Iron content ^e	do.	7,000	6,928	7,680	7,120	6,680
Steel, crude		5,000 ^r	5,000 ^r	5,000 ^r	5,000 ^r	5,000
INDUSTRIAL MINERALS						
Cement		300,000	273,963	409,513	322,419	339,977
Gypsum		43,266	45,222	49,229	44,428	36,928
Salt		20 ^e	310	420	570	455
MINERAL FUELS AND RELATED MATERIALS						
Petroleum, crude	thousand 42-gallon barrels	--	11,168	5,517	4,422	4,104

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

¹Table includes data available through October 31, 2010.

²In addition to the commodities listed, modest quantities of crude construction materials (clays, sand and gravel, and stone) presumably were produced, but output was not reported quantitatively. The minimill of Société Arabe de Fer et d'Acier en Mauritanie produced rebar and wire, but available information is inadequate to make reliable estimates of output.

TABLE 2
MAURITANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Ciment de Mauritanie (Private Mauritanian investors, 90%, and Compañía Valenciana de Cementos, 10%)	Nouakchott	400
Do.		Mauritano-Française des Ciments S.A.	do.	450
Copper		Mauritanian Copper Mines (First Quantum Minerals Ltd., 100%)	Guelb Moghrein Mine, 250 kilometers northeast of Nouakchott	37
Gold	kilograms	do.	do.	2,900
Do.	do.	Tasiast Mauritanie Ltd. S.A. (Red Back Mining Inc., 100%)	Tasiast, 300 kilometers north of Nouakchott	7,300
Gypsum		Société Arabe des Industries Métallurgiques Mauritano-Koweitiennes (SAMIA)	Sebkhia N'dramcha, between Nouakchott and Akjoujt	50
Iron ore		Société Nationale Industrielle et Minière (SNIM) (Government, 78.4%; Industrial Bank of Kuwait K.S.C., 7.17%; Arab Mining Co., 5.66%; Iraq Foreign Development Fund, 4.59%; Office National des Hydrocarbures et des Mines, 2.30%; Islamic Development Bank, 1.79%; private investors, 0.14%)	Guelb el Rhein, Kedia d'Idjill, and M'Haoudat Mines, Tris Zemmour	12,000
Do.		El Aouj Mining Co. S.A. [Sphere Investments Ltd., 50%, and Société Nationale Industrielle et Minière (SNIM), 50%]	Guelb el Aouj Mine, ¹ Zouerate	17,000
Petroleum, crude	thousand 42-gallon barrels	Petroliam Nasional Berhad (Petronas)	Chinguetti oilfield, 80 kilometers offshore	5,000
Salt	metric tons	Société Mauritanienne des Industries du Sel (SOMISEL)	Sabkha de N'terert and d'Idjill brine pits, in the southwestern part of the country	500

Do, do. Ditto

¹Under development.