



# 2016 Minerals Yearbook

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**MAURITANIA [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRY OF MAURITANIA

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The mineral sector was a major contributor to Mauritania's economy in 2016; it accounted for 12.3% of the country's gross domestic product (GDP) and 66.5% of the country's exports. Mauritania's economy continued to be adversely affected by the decline in crude petroleum and metals prices, especially that of iron ore, in the past 5 years. The GDP increased in real terms by 1.7% compared with a revised increase of 0.9% in 2015. Mauritania was Africa's 2d-ranked and the world's 14th-ranked exporter of iron ore in 2016. In addition to iron ore, Mauritania supplied the world with copper, crude petroleum, and gold. The country also produced modest quantities of cement, crude (raw) steel, granite, gypsum, marble, quartz, and salt (table 1; Banque Centrale de Mauritanie, 2017, p. 90, 93, 95; Workman, 2017).

## Minerals in the National Economy

The contribution of the mineral sector, which included crude petroleum and nonfuel mineral production, to the country's GDP increased to 12.3% in 2016 compared with 9.7% in 2015 and 26.2% in 2012. The value of mineral sector activity decreased in real terms by 1.4% in 2016 compared with a revised increase of 6.7% in 2015 and an increase of 4.2% in 2014. The value of petroleum sector activity decreased in real terms by 7.2% in 2016 compared with a decrease of 7.6% in 2015. The contribution of iron ore mining to the country's GDP increased in 2016 to 5.5% compared with a revised 1.7% in 2015 and 19.0% in 2013. Copper and gold production contributed 3.8% to the GDP in 2016 compared with 4.5% in 2015 and 6.1% in 2012 (Banque Centrale de Mauritanie, 2017, p. 90, 93).

The flow of foreign direct investment (FDI) to Mauritania continued in 2016 but at a much reduced rate compared with the historic surge of 2012. The estimated value of FDI to Mauritania in 2016 was \$272 million, which was significantly less than the \$502 million received in 2015 and 80% less than the nearly \$1.4 billion received in 2012. The value of greenfield FDI projects in Mauritania was zero in 2015 and 2016 compared with \$1.3 billion in 2014. The decrease in FDI inflow to Mauritania was attributed to weak mineral prices on the international market (United Nations Conference on Trade and Development, 2017, p. 86, 223).

## Government Policies and Programs

The Ministère du Pétrole et de l'Énergie et des Mines [Ministry of Petroleum, Energy, and Mines] is responsible for overseeing activity in the fuel and nonfuel mineral industries. The Government approved several amendments to its Hydrocarbon Code and Mining Code in 2011. The Direction des Mines et de la Géologie [Department of Mines and Geology] implements the Government's policies to enhance foreign investment in the mining sector of Mauritania. The Code Minier [Mining Law] awards exploration permits on a "first come-first served" basis for a 3-year period that can be renewed twice

for up to 3 years each time. Mining licenses are awarded for a 30-year period and are renewable for up to 10 additional years. The law exempts mining companies from customs duties for equipment during exploration and for the first 5 years of production and permanently on fuel and spare parts. The tax code includes 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, and a 16% value-added tax (Ministère du Pétrole et de l'Énergie et des Mines, 2012).

The revisions to the Mining Code in 2012 changed the method by which royalties are calculated and the area of land that is assigned for exploration permits. Mining royalties range from 1.5% to 6.5% of the price of the final processed mineral product. The royalty for Group 1 minerals, which includes chromium, iron ore, manganese, titanium, and vanadium, is assessed at 2.5% of the international commodity price. The royalty increased to 3% for iron ore sold at The Steel Index (TSI) price of between \$100 and \$150 per metric ton and to 3.5% for iron ore sold at the TSI price of between \$150 and \$200 per metric ton. The royalty for Group 2 minerals, which includes precious and nonferrous metals, is 3% of the price on the London Metal Exchange (LME), except for copper (ranges between 3% and 5%, depending on the LME price), gold (ranges between 4% and 6.5%, depending on the LME price), and platinum-group elements (4%). The royalty for Group 3 minerals, which includes coal and fuel minerals, is 1.5% of the sale price; Group 4 minerals, which includes uranium and other radioactive materials, is 3.5% of the sale price; Group 5 minerals, industrial minerals and construction materials, 2.5%; and Group 6 minerals (gemstones) and Group 7 minerals (diamond), 5% and 6%, respectively. Revisions to the mining law added a 10% tax on all mining transactions (such as transferring a license from one company to another) and made international commodity prices the basis for the royalty calculation. The area of land allocated for each exploration permit was reduced to 500 square kilometers (km<sup>2</sup>) from 1,000 km<sup>2</sup> for all minerals except for the areas allocated for diamond concessions, which remain at 5,000 km<sup>2</sup> (Ministère du Pétrole et de l'Énergie et des Mines, 2012).

## Production

Notable increases in mineral production in 2016 compared with that of 2015 included increases in the production of salt by an estimated 43%, and iron ore, by 14%. Notable decreases in mineral production in 2016 compared with that of 2015 included that of copper, which decreased by 27%; gold, by 15%, and crude petroleum, by 11%. Data on mineral production are in table 1.

## Structure of the Mineral Industry

Almost all the 70-plus local and international companies that were involved in mineral exploration and production in

Mauritania were privately owned. Together, these companies held more than 139 mineral exploration permits and 24 mining licenses. Tasiast Mauritanie Ltd. S.A. (a wholly owned subsidiary of Kinross Gold Corp. of Canada) and Mauritanian Copper Mines S.A. (MCM) (a wholly owned subsidiary of First Quantum Minerals Ltd. of Australia) produced gold in 2016. MCM was the sole producer of copper in 2016, as was PETRONAS International Corporation Ltd. (a subsidiary of Petroliaam Nasional Berhad of Malaysia) for crude petroleum. Four companies produced cement—BSA Ciments S.A., Ciment de Mauritanie S.A., Mauritano-Française des Ciments S.A., and Société des Ciments du Nord. Société Arabe des Industries Métallurgiques S.A. (SAMIA) was the sole producer of gypsum, Quartz Inc. Mauritania S.A. produced quartz, and Société Mauritanienne des Industries du Sel (SOMISEL) produced salt (table 2; Quartz Inc., 2017).

Société Nationale Industrielle et Minière (SNIM) was a majority state-owned mining company (78.35% interest); it operated iron ore mines at Guelb el Rhein, d'Idjill Kedia, 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 Atlantic coast. SNIM subsidiaries included Granites et Marbres de Mauritanie S.A. (GMM), Société Arabe des Industries Métallurgiques S.A. (SAMIA), and Société Arabe du Fer et de l'Acier S.A. (SAFA) (Société Nationale Industrielle et Minière, 2017d).

Société Mauritanienne des Hydrocarbures et de Patrimoine Minier (SMHPM), which was Mauritania's national petroleum company, held a 10% carried interest in all offshore and onshore petroleum exploration projects (Société Mauritanienne des Hydrocarbures et de Patrimoine Minier, 2017). Table 2 is a list of major mineral production facilities.

## Mineral Trade

The value of Mauritania's exports increased slightly to \$1,401 million in 2016 from \$1,389 million in 2015, but they were significantly less than that of 2012, which was \$2,641 million. The decrease was mainly attributable to lower mineral commodity prices on world markets in 2015 and 2016. Mineral commodity exports, which included copper, crude petroleum, gold, and iron ore, represented 66% of Mauritania's total exports in 2016 compared with 68% in 2015. Mauritania's iron ore exports, which increased to nearly 13.3 million metric tons (Mt) in 2016 from a revised 11.6 Mt in 2015, increased also in value by 23% to \$418 million from \$340 million in 2015. This represented a 69% decrease compared with iron ore exports in 2013, which were valued at \$1,358 million. Seventy-four percent of Mauritania's iron ore exports in 2016 went to China; 12%, to Germany; 9%, to France; and 5%, to the Netherlands. Gold exports decreased in value by 13% to \$289 million in 2016 from \$334 million in 2015; the decrease was attributed to reduced output at the Tasiast Mine owing to a labor union strike. Copper exports however, decreased in value by 29% to \$138 million in 2016 from \$195 million in 2015; the decrease was attributable to a 26% decrease in copper output and a 5% decrease in copper prices in 2016. The value of crude petroleum exports increased

by 19% to \$87 million in 2016 from \$73 million in 2015; the increase in value was attributed to the 49% increase in the volume of crude petroleum exports (Banque Centrale de Mauritanie, 2017, p. 36, 95).

Mauritania's exports to the United States, which were valued at \$50.3 million in 2016, consisted mainly of crude petroleum (\$48.2 million). In 2016, Mauritania's imports from the United States were valued at \$116.3 million. Minerals and mineral-related imports included excavating machinery (\$6.6 million), inorganic chemicals (\$4.4 million), fuel oil (\$3.5 million), unspecified manufactured mineral supplies (\$2.7 million), specialized mining equipment (\$1.9 million), drilling and oilfield equipment (\$0.9 million), and iron and steel products (\$0.8 million) (U.S. Census Bureau, 2017a, b).

## Commodity Review

### Metals

**Copper.**—The Guelb Moghrein Mine produced 32,818 metric tons (t) of copper in 2016 compared with 45,001 t in 2015. The decrease was the result of a 46% reduction in copper grade and a 9% decrease in the tonnage of ore milled. MCM milled 3.9 Mt of sulfide ore in 2016 compared with 4.0 Mt in 2015. The percentage of copper in sulfide ore processed decreased to 0.9% in 2016 from 1.2% in 2015. The total probable and proven reserves at the Guelb Moghrein Mine, which include high- and low-grade stockpiled materials, were estimated to be 22.5 Mt of ore grading 0.65% copper and 0.63 gram per metric ton (g/t) gold. The company, which estimated the life of the mine to be 10 years in 2016, planned to produce 29,000 t and 30,000 t of copper in 2017 and 2018, respectively (First Quantum Minerals Ltd., 2017, p. 21, 22; 2018).

OreCorp Mauritania S.A.R.L. (OreCorp), which was a subsidiary of OreCorp Ltd. of Australia, held two licenses (Nos. 1415 and 1416) at south Akjoujt to explore for copper, gold, and nickel in an area of about 500 km<sup>2</sup>. The Akjoujt South project lies in the Proterozoic Mauritanide Belt and is located 30 km south of the Guelb Moghrein Mine. In 2015, OreCorp carried out a diamond-drill program to test for previously defined geophysical targets of copper-nickel sulfide mineralization. In 2016, OreCorp carried out shallow drilling and trenching at the project site and planned to conduct deep core drilling in 2018 (OreCorp Ltd., 2017, p. 19–20, 30).

**Gold.**—Mauritania's gold output decreased to 7,127 kilograms (kg) in 2016 from 8,618 kg in 2015. Two mines produced gold in Mauritania in 2016—the Guelb Moghrein copper-gold mine and the Tasiast gold mine. The Guelb Moghrein Mine produced 1,678 kg of gold in 2016, which was about 16% less than the 1,991 kg of gold produced in 2015. The Tasiast gold mine produced 5,449 kg in 2016 compared with 6,813 kg of gold in 2015, which was a 20% decrease. As of yearend 2016, estimates of proven and probable mineral reserves at the Tasiast deposit were 244,500 kg (reported as 7.861 million troy ounces). The open pit mine, which used heap leach and milling for ore processing, had an expected mine life of 13 years. Kinross, which operated and owned the mine, was in the process of carrying out phase 1 of its expansion plan for the Tasiast Mine. Once completed, the expansion would increase

the mill's throughput capacity to 12,000 metric tons per day (t/d) from its current capacity of 8,000 t/d by mid-2018. Annual production at the Tasiast Mine between 2018 and 2029 is expected to be 12,700 kilograms per year (kg/yr). The company also completed the phase 2 expansion study, which would increase the milling capacity at the mine to 30,000 t/d and nearly double gold production to 25,256 kg/yr during the period from 2020 to 2029 (table 1; Kinross Gold Corp., 2016a, p. 2; 2016b; First Quantum Minerals Ltd., 2017, p. 17, 21, 40).

Algold Resources Ltd. of Canada became the sole owner of the Tijirit exploration license in 2016 following the acquisition of the license from Gryphon Minerals Ltd. of Australia in March. The Tijirit deposit lies within the Archean Reguibat shield in northwestern Mauritania; it is located 25 km southeast of the Tasiast Mine in Mauritania's gold mining district. The Tijirit gold project encompassed connecting exploration licenses covering an area of about 1,460 km<sup>2</sup>. In 2016, Algold was working on updating the project's mineral resources, which in August 2016 were estimated to be 900 kg in total measured and indicated resources of gold and 7,513 kg in total inferred resources of gold at a cutoff grade of 1.0 g/t gold (Algold Resources Ltd., 2016, p. ix, 87).

Artisanal gold mining was reported in the Chami region in western Mauritania by the Federal Institute for Geosciences and Natural Resources of Germany. In 2016, there were more than 10,000 artisanal gold miners in Mauritania. The Ministry of Petroleum, Energy, and Mines was considering ways to legalize and support such mining activity in the Chami region (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, 2017; 2018, p. 30).

**Iron Ore.**—Mauritania's iron ore production increased to nearly 13.3 Mt in 2016 from 11.6 Mt in 2015 despite the fluctuations in iron ore prices on the world market. The increase was attributed to the commissioning of the 4-Mt/yr Guelb el Rhein 2 plant (Guelb 2) in Zouerate (the second plant in the Guelb el Rhein mining complex) in 2015. Iron ore exports increased to 30% of total exports in 2016 from 24% in 2015. SNIM was the sole producer of iron ore in Mauritania; it operated three iron ore mines—the Guelb el Rhein Mine, the Kedia d'Idjill Mine, and the M'Haoudat Mine. The Guelb el Rhein deposit contained several hundred million metric tons of magnetite ore grading 37% iron. Iron ore mined at Guelb el Rhein is concentrated at the Guelb el Rhein plants by dry magnetic separation to increase the ore grade to 68.5% iron. Hematite iron ore deposits are located at the Kedia d'Idjill and the M'Haoudat areas, which accounted for 60% of SNIM's iron ore production (tables 1, 2; Société Nationale Industrielle et Minière, 2017a, p. 8; 2017b, c).

In 2016, SNIM continued the implementation of its strategic program, which was approved in 2013 and consisted of building new iron ore concentration plants that use low-grade ore. SNIM aimed to increase its iron ore production capacity to 25 million metric tons per year (Mt/yr) by 2019 and 40 Mt/yr by 2025 from 16 Mt/yr in 2016. By yearend 2016, Mauritania had the capacity to process, transport, and export more than 16 Mt/yr of iron ore following completion of construction of a second loading dock at the Port of Nouadhibou on the Atlantic coast (table 2;

Société Nationale Industrielle et Minière, 2013, 2016, 2017c; Manson, 2014).

In 2016, SNIM was involved in upgrading the 5-Mt/yr Guelb el Rhein 1 plant (Guelb 1) following the commissioning of the 4-Mt/yr Guelb 2 plant in 2015. Both plants produced high-grade concentrated iron ore (Société Nationale Industrielle et Minière, 2017b).

Glencore plc of Switzerland and the United Kingdom held interests in three iron ore deposits in Mauritania through three of its subsidiaries (Al Aouj Mining Co. S.A., Sphere Lebtheinia S.A., and Sphere Mauritania S.A.). Al Aouj Mining Co. completed the El Aouj East feasibility study and the updated reserve estimates for the El Aouj East and Askaf North properties. The El Aouj Mining Co. S.A. was a 50–50 joint venture of SNIM and Glencore. In November 2015, the company increased the total reserve estimate for the El Aouj East site to 931 Mt from 756 Mt of magnetite ore grading 35% iron. In 2016, Sphere Mauritania S.A. suspended the development of the Askaf iron ore project owing to the collapse of iron ore prices in the world market. In September 2015, Sphere offered to sell 80% interest in the company to Al Rawda Resources Ltd. of the United Arab Emirates, but the deal had not been made final by yearend 2016 (Sphere Minerals Ltd., 2015, 2016; Glencore plc, 2018, p. 217).

Bumi Mauritania S.A. which was subsidiary of PT Bumi Resources Minerals Tbk (BRMS) of Indonesia, held two iron ore concessions in the S'fariet region in the north and the Tamagot region in the center of Mauritania. The S'fariet permit (no. 270) was located about 250 km north of the town of Zouerate, where SNIM had its main iron ore mining operations. The Tamagot concession (permits no. 849 and 850), which covers 1,291 km<sup>2</sup>, is located about 50 km south of the town of Akjoujt. Bumi planned to carry out additional diamond and reverse-circulation drilling, metallurgical testing, and sample analysis (PT Bumi Resources Minerals Tbk, 2018).

### *Mineral Fuels and Related Materials*

**Uranium.**—In 2016, Aura Energy Ltd. of Australia started the Tyriss definitive feasibility study (DFS) by drilling 4,250 meters at the Tiris site to explore for and update the estimate of its uranium mineral resources. The DFS was expected to be completed by yearend 2017. Resources at the Tiris deposit were estimated to be 66 Mt grading 334 parts per million (ppm) U<sub>3</sub>O<sub>8</sub> for a total of 22,000 t of U<sub>3</sub>O<sub>8</sub>. Aura Energy hoped that the results of the scoping study would lead to the construction of a uranium mine and leach processing plant capable of producing 454,000 kg/yr of U<sub>3</sub>O<sub>8</sub> for 15 years. Aura Energy expected to begin production by late 2018 to early 2019 (Aura Energy Ltd., 2017, p. 2, 6, 11, 16, 33).

### **Outlook**

Increasing the country's output of iron ore production has been a major goal of the Government's economic development plan. Mauritania will likely continue to develop its infrastructure and mineral resources in general and iron ore in particular despite the fluctuations in mineral commodity prices. SNIM is planning to increase its capacity to produce iron ore to 25 Mt/yr

by 2019 and to 40 Mt/yr by 2025 from the current 16 Mt/yr. Gold production at the Tasiast gold mine is expected to increase to more than 12,000 kg/yr by 2018 following the completion of its phase 1 expansion plan and to 25,000 kg/yr by 2020 following the completion of phase 2. Aura Energy is expected to start uranium production in Mauritania for the first time at the Tiris uranium mine in 2019.

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TABLE 1  
MAURITANIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2012	2013	2014	2015	2016
<b>METALS</b>					
Copper, mine production, Cu content	37,670	37,970	33,079	45,001	32,818
Gold, mine production, Au content kilograms	7,652	9,513	9,625	8,618	7,127
Iron and steel, raw steel	5,000 <sup>r</sup>	5,000 <sup>r</sup>	5,000 <sup>r</sup>	5,000 <sup>r</sup>	5,000
Iron ore, mine production:					
Gross weight thousand metric tons	11,170 <sup>r</sup>	12,531 <sup>r</sup>	13,306 <sup>r</sup>	11,607 <sup>r</sup>	13,268
Fe content do.	7,254 <sup>r</sup>	8,149 <sup>r</sup>	8,278 <sup>r</sup>	7,254 <sup>r</sup>	8,292
<b>INDUSTRIAL MINERALS</b>					
Cement, hydraulic	630,000	690,000	870,000 <sup>r</sup>	860,000 <sup>r</sup>	880,000 <sup>e</sup>
Gypsum <sup>e</sup>	60,000 <sup>r</sup>	60,000 <sup>r</sup>	60,000 <sup>r</sup>	70,000	70,000
Salt	700	700	700	700	1,000 <sup>e</sup>
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Petroleum, crude thousand 42-gallon barrels	2,400	2,460	2,200	1,933	1,727

<sup>e</sup>Estimated. <sup>r</sup>Revised. do. Ditto.

<sup>1</sup>Table includes data available through February 23, 2018. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>In addition to the commodities listed, crude construction materials (clays, sand and gravel, and stone), granite, marble, phosphate rock, and quartz may have been produced in Mauritania, but available information was inadequate to make reliable estimates of output.

TABLE 2  
MAURITANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Ciment de Mauritanie S.A.	Nouakchott	900
Do.		Mauritano-Française des Ciments S.A.	do.	450
Do.		BSA Ciment S.A. (Vicat Group, 65%)	do.	450
Do.		Société des Ciments du Nord (Ciments du Maroc)	Nouadhibou	NA
Copper		Mauritanian Copper Mines S.A. (MCM) (First Quantum Minerals Ltd., 100%)	Guelb Moghrein Mine, Akjoujt, Inchiri District	45
Gold	kilograms	Tasiast Mauritanie Ltd. S.A. (Kinross Gold Corp., 100%)	Tasiast gold mine, 300 kilometers north of Nouakchott	8,000
Do.	do.	Mauritanian Copper Mines S.A. (MCM) (First Quantum Minerals Ltd., 100%)	Guelb Moghrein Mine, Akjoujt, Inchiri District	2,000
Gypsum		Société Arabe des Industries Métallurgiques S.A. (SAMIA) [Industrial Bank of Kuwait, 50%, and Société Nationale Industrielle et Minière (SNIM), 50%]	Sebkha N'dramcha, Nouakchott	75
<b>Iron and steel:</b>				
Iron ore		Société Nationale Industrielle et Minière (SNIM) (Government, 78.35%; 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, Tiris Zemmour region	16,000
Iron ore, concentrated		do.	Guelb el Rhein 1 and 2, Tiris Zemmour region	9,000
Steel	metric tons	Société Arabe du Fer et de l'Acier S.A. (SAFA) [Société Nationale Industrielle et Minière (SNIM), 100%]	Nouadhibou	5,000
Petroleum, crude	thousand 42-gallon barrels	PETRONAS International Corporation Ltd. (Petroliam Nasional Berhad, 100%)	Chinguetti oilfield, 80 kilometers offshore	2,500
Quartz		Mauritania Minerals Co. S.A. (MMC), 90%, and Government, 10%)	Oum Agueineina	300
Do.		Quartz Inc. Mauritania S.A. (Quartz Inc., 90%, and Government, 10%)	Chami Province	200
Salt	metric tons	Société Mauritanienne des Industries du Sel (SOMISEL)	Sebkha de N'Terert and Sebkhet ej Jill brine pits, in the southwestern part of the country	1,000

Do., do. Ditto. NA Not available.