



2014 Minerals Yearbook

BAHRAIN

THE MINERAL INDUSTRY OF BAHRAIN

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In 2014, Bahrain was the world's 10th-ranked primary aluminum producer and accounted for 1.8% of total world production. Bahrain was one of the world's notable direct-reduced iron (DRI) producers and accounted for 1.9% of world production in 2014. The country was a modest producer of crude oil, natural gas, and refined petroleum products in 2014. Other mineral commodities produced in Bahrain included ammonia, cement, ferromanganese, ferrosilicon, iron ore pellets, methanol, stainless steel, sulfur, and urea (table 1; Bray, 2016, p. 17; Midrex Technologies Inc., 2015, p. 2, 8).

Minerals in the National Economy

In 2014, Bahrain's real gross domestic product (GDP) increased by 4.7% compared with an increase of 5.3% in 2013. The manufacturing and mining sector accounted for nearly 39% of the GDP in 2014, including 12% from the aluminum industry, which employed more than 5,000 people. The oil sector accounted for 20% of the GDP and increased in value by 3% in real terms in 2014 compared with an increase of 15.3% in 2013. The nonoil sector GDP increased in value by 4.9% in real terms in 2014 compared with an increase of 3% in 2013. The Government's oil revenue accounted for 24% of the country's total revenue in real terms in 2014, which was a slight increase from that of 2013 (Bahrain Economic Development Board, 2015a, b, p. 2; Central Informatics Organization, 2015b; International Monetary Fund, 2015, p. 175)..

Production

In 2014, Bahrain increased its full-year DRI production to 1.44 million metric tons (Mt) from a partial year output of 0.78 Mt in 2013. Primary aluminum output increased to 931,427 metric tons (t) in 2014 from 912,700 t in 2013. Bahrain's crude oil production increased by 2.4% compared with that of 2013, and gross natural gas production increased by 8% (table 1).

Structure of the Mineral Industry

Bahrain's mineral sector was composed of a wide range of industries, including the aluminum industry, which depended on imported alumina; the iron and steel industry, which depended on imported iron ore; the cement industry, which depended on locally produced limestone; and the nitrogen fertilizer industry, which depended on locally produced and imported petroleum. Although the Government was a major investor in Bahrain's mineral industries, companies from Kuwait, Saudi Arabia, and the United Arab Emirates (UAE) held substantial equity interest in most of the country's mineral enterprises (table 2).

The National Oil and Gas Authority (NOGA) is the Government agency responsible for making policy, issuing regulations, and controlling the use of hydrocarbon resources in Bahrain. Some of the NOGA's responsibilities include

coordinating hydrocarbon exploration activities with petroleum companies through exploration and production-sharing agreements, implementing oil and gas laws and environmental protection policies, and setting local petroleum products and natural gas pricing policies. NOGA Holding Co. was the NOGA's business and investment branch and the Government's shareholder in such companies as Bahrain Petroleum Co. B.S.C. (Bapco, 100% interest), Bahrain National Gas Co. B.S.C. (Banagas, 75% interest), Bahrain Aviation Fueling Co. (60% interest), Bahrain Lube Base Oil Co. (55% interest), Tatweer Petroleum (51% interest), Skaugen Gulf Petchem Carriers (35% interest), and Gulf Petrochemical Industries Co. B.S.C. (GPIC, 33.3% interest). Tatweer Petroleum was a joint venture between Mubadala Development Co. of the UAE, the NOGA, and Occidental Petroleum Corp. of the United States (table 2; National Oil and Gas Authority, 2015b, c).

United Steel Co. B.S.C. (Sulb) was a public iron and steel company that produced crude steel, DRI, and medium- and heavy-steel sections at its complex in the Hidd Industrial Area. The company's shares were distributed between Foulath Holding B.S.C. (51%) and Yamatu Kogyo Co. of Japan (49%). Aluminium Bahrain B.S.C. (Alba) was a public aluminum company that produced primary aluminum from its smelter at Sitra. The company's shares were distributed among Government-owned Bahrain Mumtalakat Holding Co. (69.38%), SABIC Industrial Investments Co. Ltd. of Saudi Arabia (20.62%), and others (10%). Gulf Aluminium Rolling Mill Co. B.S.C., which was a state-owned company, was one of the first local downstream aluminum producers in the country; it produced rolled aluminum products, including aluminum circles, coils, and sheets (table 2; Gulf Aluminium Rolling Mill Co. B.S.C., 2015).

The Royal Law No. 36 for 2014 was enacted by the Government to limit illegal trading of petroleum. The first article of the law defines illegal trading activities as smuggling and unlicensed export of petroleum products and stipulates the penalties for such offenses. In its second article, the law delineates the NOGA's role as the Government entity that is responsible for issuing and monitoring petroleum products export permits and specifies that possession of petroleum-loaded tankers within Bahrain's shores without the NOGA's approval is a violation of the law (National Oil and Gas Authority, 2015a).

Mineral Trade

In 2014, the value of Bahrain's oil exports accounted for 56% of the total value¹ of exports, which was a slight increase from that of 2013. The value of Bahrain's oil imports accounted for 55% of the total value of imports in 2014, similar to that of 2013. Some of Bahrain's minerals exports included primary

¹Where necessary, values have been converted from Bahraini dinars (BD) to U.S. dollars (US\$) at an average rate of BD2.65=US\$1.00 for 2013 and 2014.

and secondary aluminum products, ferroalloys, pelletized iron ore, and scrap metals; petrochemical products that included ammonia, methanol, and urea; and crude oil and refined petroleum products. Some of Bahrain's mineral imports included alumina, gravel and crushed stone, iron ore, petroleum coke, and oilfield minerals, such as barite and bentonite. Bahrain's aluminum products exports increased by 6.6% to 915,000 t in 2014 from 858,000 t in 2013 owing to increased production at Alba's smelter in Sitra and decreased domestic use (Central Informatics Organization, 2015a–c).

The value of U.S. exports to Bahrain increased by 4.1% to \$1,060 million in 2014 from \$1,017 million in 2013. U.S. exports to Bahrain included civilian aircraft, drilling and oilfield equipment, and industrial engines. The value of U.S. imports from Bahrain increased by 52% to \$965 million in 2014 from \$636 million in 2013 owing to significant increases in imports of steelmaking materials (155%), petroleum products (74%), chemical fertilizers (65%), and aluminum (51%). The United States was Bahrain's largest petrochemical products export market and accounted for 46% of the total volume of those exports in 2014 (Gulf Petrochemical Industries Co. B.S.C., 2015, p. 27; U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Aluminum.—Alba, which had the capacity to produce 931,000 metric tons per year (t/yr) of primary aluminum, increased its production in 2014 by 2.1% to a record level of output. Alba employed 3,000 people in 2014, and nearly 87% of those employed were Bahraini nationals. Alba's aluminum products included extrusion billets (40%), liquid metal (30%), foundry alloys (14%), rolling slabs (13%), and standard aluminum ingots (3%). About 49% of the company's output was used locally, 18% was exported to other countries in the Middle East and North Africa, 15% went to customers in Europe, 13% went to customers in Asia, and 5% went to markets in North America and South America (table 1; Aluminium Bahrain B.S.C., 2015, p. 6, 8, 14, 25, 38).

Alba reached an agreement with the Government in 2014 to secure natural gas allocations for its six-potline expansion project. The project was expected to add about 514,000 t/yr of primary aluminum to the company's current capacity. Alba was estimated to reach a production capacity of 1.4 million metric tons per year (Mt/yr) of primary aluminum by the end of the expansion project, which was expected to make the company's smelter at Sitra one of the world's largest single-site aluminum smelters. The expansion project, which was estimated to cost \$3.5 billion and would include a powerplant with the capacity to produce 1,300 megawatts (MW), was expected to be commissioned by 2016 (Aluminium Bahrain B.S.C., 2015, p. 11; Baxter and Roscoe, 2015).

By yearend 2014, Gulf Aluminium Rolling Mill Co. B.S.C., which had the capacity to produce 165,000 t/yr of aluminum products, was expected to build a new aluminum remelt facility. Fives Group of France was expected to carry out the procurement and construction of the project, which was expected to develop Gulf Aluminum's metal recycling

capabilities and to decrease the cost of metal casting by adding the capacity to produce 120,000 t/yr of aluminum slabs. Fives was expected to start work in the third quarter of 2015 and to complete the project in 21 months (table 2; Aluminium Bahrain B.S.C., 2015, p. 31; Watts, 2015).

Iron and Steel.—In 2014, Sulb increased production by about 85% compared with that of 2013 after completing its first full year of production at its DRI plant at the Hidd Industrial Area, which was commissioned in 2013. In addition to its 1.5-Mt/yr-capacity DRI plant, Sulb's iron and steel works at the Hidd Industrial Area comprised a 0.97-Mt/yr electric-arc-furnace crude-steel melt shop and a 0.6-Mt/yr medium- and heavy-section rolling mill (table 2; Midrex, 2015, p. 2, 8; Organization for Economic Co-operation and Development, 2015, p. 28).

Bahrain Steel BSCC E.C., which was wholly owned by Foulath Holding B.S.C., operated two iron-pelletizing plants at the Hidd Industrial Area with a combined capacity of 11 Mt/yr of pelletized iron ore. The first plant, which was upgraded in 2007, had a design capacity of 5 Mt/yr of iron pellets, whereas the second plant had the capacity to produce 6 Mt/yr of iron pellets. The company sourced its iron ore from suppliers in Brazil, Chile, Norway, and Sweden through long-term agreements. Bahrain Steel sent its production to India, Oman, Qatar, and Saudi Arabia in addition to the domestic market (table 2; Sponge Iron India, 2014, p. 3, 5, 8).

Industrial Minerals

Cement.—In 2014, Bahrain had the capacity to produce about 2.4 Mt/yr of cement from two plants and a cement-grinding mill. Falcon Cement Co., which was owned by Cemena Holding Company B.S.C. of Bahrain, operated a plant (located in the Hufaira Industrial Area) with the capacity to produce 1.2 Mt/yr of cement. The company's products included portland and sulfate-resistant cement and mainly supplied the domestic market (table 2; Falcon Cement Co. B.S.C., 2015).

Al Sager Cement Co., which was the second-ranked cement producer in Bahrain, embarked on a development project to increase the production capacity at its plant in the Hidd Industrial Area to 825,000 t/yr from 750,000 t/yr. In May, the company approved a \$30 million development project with LV Technology Public Company Ltd. of Thailand to supply equipment and carry out the expansion project. This expansion resulted from increased domestic demand for cement owing to new construction projects (Ministry of Industry and Commerce, 2014; World Cement, 2014).

Nitrogen.—In 2014, GPIC, which was Bahrain's sole petrochemicals producer, had a slight decrease in its ammonia output, whereas it had slight increases in both its methanol and urea outputs compared with those of 2013. About 75% of the company's total products (by volume), or 1.2 Mt, was exported to global markets using 66 ships. Urea accounted for about 57% of GPIC's exports, followed by methanol (37.3%) and ammonia (5.7%). Most of the company's ammonia production was used to produce urea locally. GPIC's ammonia exports, which amounted to 70,228 t, were sent to the Republic of Korea (41%), Taiwan (26%), Indonesia and Thailand (9% each), Japan and the United States (6% each), and Singapore (3%). GPIC's methanol

exports, which amounted to 459,438 t, were sent to Taiwan and the United States (27% each), China (19%), Singapore (13%), the Republic of Korea (5%), UAE (4%), Italy (3%), and the Netherlands and Thailand (1% each). GPIC's urea exports, which amounted to 698,272 t, were sent to the United States (62%), South America (21%), Thailand (13%), and Africa (4%) (table 1, 2; Gulf Petrochemical Industries Co. B.S.C., 2015, p. 8, 18–19, 26–27).

Mineral Fuels

Natural Gas and Petroleum.—In 2014, Bahrain produced a total of 73.9 million barrels (Mbbbl) of crude oil, including about 17.8 Mbbbl from the Bahrain oilfield, which was operated by Bapco, and 56.1 Mbbbl from Bahrain's 50% share of the Abu Saafa offshore oilfield. The Abu Saafa oilfield was jointly owned by Bahrain and Saudi Arabia and was operated by the Saudi Arabian Oil Co. (Saudi Aramco). Banagas' total natural gas production, which included dry and associated gas, increased to 31.6 billion cubic meters in 2014 from 29.4 billion cubic meters in 2013 (table 1, 2; Central Bank of Bahrain, 2014, p. 6).

By yearend 2014, Banagas commissioned a new gas compression station that had the capacity to process about 1.7 million cubic meters per day of natural gas received from the Bahrain oilfield. The project was carried out by JGC Gulf International Co. Ltd., which had its shares distributed between JGC Corp. of Japan (75%) and JGC Singapore Ptd. of Singapore (25%), at a cost of \$42.4 million (National Oil and Gas Authority, 2014; JGC Gulf International Co. Ltd., 2015).

By the third quarter of 2014, Bapco continued its plans to increase the production capacity at its oil refinery at Sitra to 360,000 barrels per day (bbl/d) from 267,000 bbl/d. The plans were expected to include four refinery modernization packages, including a crude-oil-processing unit and associated facilities, a hydrocracker unit and associated facilities, a residue conversion unit and associated facilities, and other utilities with an estimated cost of \$9 billion. As part of the Sitra refinery modernization project, Bapco awarded a \$55 million contract for engineering and design of a residue conversion unit to Technip Corp. of France. The project, which was expected to take 16 months to complete, was expected to develop a residue conversion unit that would process higher viscosity grades of crude oil into refined oil products. Bapco also awarded Chevron Lummus Global LLC of the United States a contract for approximately \$100 million to carry out the installation of a residue hydrocracker, including vacuum gas oil hydrocracker units and technologies, as part of the Sitra refinery modernization project. The new technologies were expected to support the production of improved transportation fuels and lubricants (Baxter, 2014a, c).

Outlook

Bahrain's economy is expected to grow at a rate of 2.7% in 2015 and 2.4% in 2016, according to the International Monetary Fund. The country's nonhydrocarbon sector is expected to continue to be an important component of economic growth in the short term. Although the hydrocarbon sector is expected to have a slower rate of growth as a result of the decline in global

crude oil prices, it is still expected to continue its significant contribution to the economy. The Government's projections of decreased national expenditures and revenue, combined with an increase in the country's deficit, are expected to affect many mineral industry development plans in the short and medium terms. Beginning in 2015, the Government is expected to gradually decrease \$1.62 billion of annual natural gas subsidies that were used to supply 35 domestic industrial companies. These measures are expected to mitigate a projected budget deficit of 5.7% of the country's GDP during the next 2 years. Alba's expansion project was expected to increase its production capacity by 50% within 2 years, which would be a significant contribution to the development of the mineral industry. Bahrain is expected to continue its petroleum and natural gas exploration to increase its oil and gas production capacities; however, this process is expected to progress at a slower pace owing to insufficient funding in the short term. The country is expected to increase use of enhanced oil recovery technologies, such as steam injection and water flooding, in order to improve output at its oil and gas wells. Bahrain is expected to remain a global supplier of aluminum, ammonia, DRI, and urea and a regional supplier of pelletized iron ore (Baxter, 2014b; Baxter and Roscoe, 2015; Bahrain Economic Development Board, 2015b, p. 2, 21–22; International Monetary Fund, 2015, p. 175; Thomson Reuters, 2015).

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TABLE 1
BAHRAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²	2010	2011	2012	2013	2014	
METALS						
Aluminum metal, primary	metric tons	850,700	881,310	890,217	912,700	931,427
Iron and steel:						
Crude steel ^c		950	950	950	970	970
Direct-reduced iron		--	--	--	780	1,440
Iron ore pellets ^{3, c}		8,000	11,000	11,000	11,000	11,000
Stainless steel ^c	metric tons	90,000	90,000	90,000	90,000	90,000
Steel-reinforcing bar ^c	do.	200,000	200,000	200,000	200,000	200,000
Ferromanganese	do.	5,600	35,300	35,000	35,000	35,000
Ferrosilicon	do.	3,700	3,000	3,000	3,000	3,000
INDUSTRIAL MINERALS						
Cement ^c		1,200 ^r	1,300 ^r	1,350 ^r	1,350 ^r	1,500
Nitrogen:						
N content of ammonia		357	380	341	378	372
N content of urea		290	310	288	316	319
Sulfur ^c		137	132	135	64 ^r	64
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural:						
Gross	million cubic meters	15,762	15,641	15,370	13,600 ^r	14,700
Dry	do.	12,800	13,100	13,700	15,800	16,900
Methanol		417	443	416	446	453
Natural gas plant liquids:						
Propane	thousand 42-gallon barrels	1,000	990	1,000	924 ^r	995
Butane	do.	937	908	900	868 ^r	832
Naphtha	do.	1,835	1,760	1,800	1,698 ^r	1,883
Petroleum:						
Crude ⁴	do.	66,376	69,452	63,302	72,124	73,882
Refinery products:						
Liquefied petroleum gas	do.	548	584	600	654 ^r	685
Gasoline	do.	7,600	6,205	7,000	5,640 ^r	6,398
Kerosene and Jet fuel	do.	1,606	1,168	1,600	26,604 ^r	23,253
Distillate fuel oil	do.	31,755	28,470	32,000	16,675 ^r	14,287
Residual fuel oil ^c	do.	15,330	16,279	18,000	2,012 ^r	3,684
Other ^c	do.	42,523	43,320	41,903	48,377 ^r	51,926
Total	do.	99,362	96,026	101,103	99,962	100,233

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through December 23, 2015.

²Aggregates, ferrochrome, sand, and stone were also produced, but available information was inadequate to make reliable estimates of output.

³Pellets were produced from imported iron ore and exported for use by direct-reduction plants.

⁴Includes the country's share of production from the Abu Saafa field.

TABLE 2
BAHRAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum:				
Metal:				
Primary and secondary		Aluminium Bahrain B.S.C. (Bahrain Mumtalakat Holding Co., 69.38.5%; SABIC Industrial Investments Co. Ltd., 20.62%; others, 10%)	Smelter at Sitra	931,000
Secondary		Bahrain Recycling Plant (private, 100%)	Dross and scrap remelt facilities at Askar	4,500
Rolled products		Gulf Aluminium Rolling Mill Co. B.S.C. (Bahrain Mumtalakat Holding Co., 38%; Saudi Basic Industries Corp., 30%; Industrial Bank of Kuwait, 17%; Gulf Investment Corp., 6%; Government of Iraq, 5%; Government of Oman, 2%; Government of Qatar, 2%)	Rolling mill at Sitra	165,000
Do.		Midal Cables Ltd. (Intersteel W.L.L., 50%, and Saudi Cable Co., 50%)	Rolling mill at Manama	120,000
Alloys		Bahrain Alloys Manufacturing Co	Sitra	30,000
Flat products		Bahrain Aluminum Extrusion Co.	do.	25,000
Wheel castings		Aluminium Wheel Co. W.L.L.	Manama	400,000
Powder		Bahrain Atomisers International B.S.C.	East Riffa Area	NA
Cement		Arabian Gulf Cement Co. W.L.L. (Star Cement Co. W.L.L., 100%)	Clinker grinding mill at Hidd	400,000
Do.		Falcon Cement Co. (Cemena Holding Company B.S.C., 100%)	Hufaira Industrial Area	1,241,000
Do.		Al Sager Cement Co. (private, 100%)	Plant at Hidd	825,000
Iron and steel:				
Direct-reduced iron		United Steel Co. B.S.C. (Sulb) [Foulath Holding B.S.C., 51%, and Yamatu Kogyo Co. of Japan, 49%]	Hidd Industrial Area	1,500,000
Iron ore pellets		Bahrain Steel BSCC E.C. (Foulath Holding B.S.C., 100%)	Pellet plants at Hidd	11,000,000
Steel:				
Crude		United Steel Co. B.S.C. (Sulb) [Foulath Holding B.S.C., 51%, and Yamatu Kogyo Co. of Japan, 49%]	Hidd Industrial Area	970,000
Heavy sections		do.	do.	600,000
Hot-rolled		United Stainless Steel Co. B.S.C. (Gulf United Steel Holding Co., 100%)	do.	100,000
Stainless		Universal Rolling W.L.L.	do.	200,000
Ferroalloys		Bahrain Ferro Alloys B.S.C. (ETA Star Holdings L.L.C., 100%)	do.	55,000
Methanol		Gulf Petrochemical Industries Co. B.S.C. (GPIC) (National Oil and Gas Authority, 33.3%; Petrochemical Industries Co., 33.3%; Saudi Basic Industries Corp., 33.3%)	Sitra	450,000
Natural gas:				
Extracted	million cubic meters	Bahrain Petroleum Co., B.S.C. (Bapco) (closed) (National Oil and Gas Authority, 100%)	Bahrain field, Awali	13,900
Liquids:				
Butane	thousand 42-gallon barrels	Bahrain National Gas Co. B.S.C. (Bangas) (National Oil and Gas Authority, 75%; Boubyan Petrochemical Co. 12.5%; Chevron Bahrain, 12.5%)	Natural gas plant at Awali	1,100
Naphtha	do.	do.	do.	1,020
Propane	do.	do.	do.	1,800
Nitrogen:				
Ammonia		Gulf Petrochemical Industries Co. B.S.C. (GPIC) (National Oil and Gas Authority, 33.3%; Petrochemical Industries Co., 33.3%; Saudi Basic Industries Corp., 33.3%)	Sitra	500,000
Urea		do.	do.	700,000

See footnotes at end of table.

TABLE 2—Continued
BAHRAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:				
Synthetic coke		Aluminium Bahrain B.S.C. (Bahrain Mumtalakat Holding Co., 69.38.5%; SABIC Industrial Investments Co. Ltd., 20.62%; others, 10%)	do.	600,000
Crude	thousand 42-gallon barrels	Saudi Arabian Oil Co. (Saudi Aramco)	Abu Saafa offshore oilfield	93,400 ¹
Do.	do.	Bahrain Petroleum Co., B.S.C. (Bapco) (closed) (National Oil and Gas Authority, 100%)	Bahrain field, Awali	15,600
Refinery products	do.	do.	Sitra	267,000
Lube oil	do.	Bahrain Lube Base Oil Co. [National Oil and Gas Authority, 55%; Bahrain Petroleum Co., B.S.C. (Bapco) (closed), 27.5%; Neste Oil Corp., 27.5%]	do.	2,800
Sulfur		Bahrain Petroleum Co., B.S.C. (Bapco) (closed) (National Oil and Gas Authority, 100%)	do.	135,000

Do., do. Ditto. NA Not available.

¹Production from the field is pumped to Bahrain and subsequently refined and marketed by Bahrain Petroleum Co.