



# 2013 Minerals Yearbook

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## BAHRAIN

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# THE MINERAL INDUSTRY OF BAHRAIN

By Mowafa Taib

The Kingdom of Bahrain is the smallest country in the Middle East region in terms of land area (770 square kilometers) and population (1.2 million). Bahrain is one of the six countries that make up the Cooperation Council for Arab States of the Gulf, better known as the Gulf Cooperation Council (GCC). In 2013, Bahrain's primary aluminum output accounted for 1.9% of total world production, making the country the world's 10th-ranked producer of primary aluminum. Other mineral commodities produced in Bahrain included ammonia, cement, crude oil, direct-reduced iron (DRI), iron ore pellets from imported iron ore, ferromanganese, ferrosilicon, methanol, natural gas, refined petroleum products, stainless steel, sulfur, and urea (table 1; Bray, 2014; Central Information Organization, 2014a).

## Minerals in the National Economy

In 2013, Bahrain's gross domestic product (GDP) increased by 4.9% in real terms compared with an increase of 3.4% in 2012. The hydrocarbon sector, which accounted for 21% of the GDP, increased in value by 15.3% in real terms in 2013 compared with a decrease of 8.5% in 2012. The manufacturing sector, which included aluminum, fertilizer, and iron and steel production, accounted for 12% of the GDP. The Government's gas and oil revenue accounted for 88% of the country's total revenue in 2013 compared with about 87% in 2012 (Central Bank of Bahrain, 2014, p. 5, 7; International Monetary Fund, 2014, p. 4).

## Production

United Steel Co. B.S.C. (SULB), which was a joint venture of Gulf United Steel Holding Co. (Foulath, 51% interest) and Yamato Kogyo Co. Ltd. of Japan (49% interest) commenced production at its 1.5-million-metric-ton-per-year (Mt/yr)-capacity DRI plant at the Hidd Industrial Area in Bahrain for the first time, and partial year output in 2013 was 780,000 metric tons (t). Primary aluminum output, which was produced solely by Aluminium Bahrain B.S.C. (Alba), increased by 2.5%. Bahrain's crude oil production increased by about 14% and gross natural gas production increased by 2.6% compared with those of 2012. The increase was attributed to the completion of the Bahrain National Gas Co. B.S.C. (Banagas) expansion projects. Ammonia and urea production, which were solely produced by Gulf Petrochemical Industries Co. B.S.C. (GPIC), increased by 12% and 10%, respectively, compared with those of 2012 (table 1).

## Structure of the Mineral Industry

Bahrain had significant mineral industries for the Gulf region but, with the exception of quarrying for limestone for cement, there were no active mines in the country. The mineral industry included a petrochemical sector, which produced nitrogen fertilizer and depended on locally produced and imported crude oil, and aluminum and iron and steel sectors, which depended

entirely on imported alumina and iron ore, respectively, for their operations. 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. The National Oil and Gas Authority (NOGA) was the Government agency that was responsible for making policy, issuing regulations, and controlling the use of Bahrain's hydrocarbon resources. NOGA Holding Co. was NOGA's business and investment wing and the Government's shareholder in such companies as Bahrain Petroleum Co. B.S.C. (Bapco) (100% interest), Banagas (75% interest), Bahrain Aviation Fueling Co. (60% interest), Bahrain Lube Base Oil Co. (Bloc) (55% interest), Tatweer Petroleum (51% interest), Skaugen Gulf Petchem Carriers (35% interest), and GPIC (33.3% interest). Tatweer Petroleum was a joint venture of NOGA, Mubadala Development Co. of the UAE, and Occidental Petroleum Corp. of the United States and was created to increase crude oil production from the Bahrain oilfield and to meet Bahrain's future energy requirements (National Oil and Gas Authority, 2013, p. 8).

Alba was a public company listed on the Bahrain Bourse and the London Stock Exchange; its 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%) (Aluminium Bahrain B.S.C., 2014a, p. 46; Tatweer Petroleum, 2014).

## Mineral Trade

In 2013, the value of Bahraini exports increased by 5.3% to \$20.9 billion from \$19.8 billion in 2012. The value of oil and refined products exports was \$15.3 billion or 73.2% of total exports. The value of imports increased slightly to \$13.7 billion in 2013 from \$13.2 billion in 2012. The main mineral exports for Bahrain included primary and secondary aluminum products, ferroalloys, pelletized iron ore, and scrap metals, and the major minerals imports included alumina, gravel and crushed stone, iron ore, petroleum coke, and oilfield minerals, such as barite and bentonite (Central Information Organization, 2014a, b).

The value of U.S. exports to Bahrain decreased to \$1,018 million from \$1,176 million in 2012, and the value of U.S. imports from Bahrain decreased to \$636 million from \$701 million in 2012. U.S. exports to Bahrain included mainly civilian aircraft, industrial engines, machines, and passenger cars. Bahrain's exports to the United States included aluminum (\$148 million), nitrogen fertilizer (\$91 million), and finished metals (\$33 million) (U.S. Census Bureau, 2014).

## Commodity Review

### Metals

**Aluminum.**—In 2013, Alba increased its primary aluminum output to about 913,000 t, which was a record high for the company, from 890,000 t in 2012. Alba's mix of aluminum products included extrusion billet (40%), liquid metal (31%), rolling slabs (13%), foundry alloys (13%), and standard ingots (3%). About 50% of the company's output was used locally; 25% was exported to other countries in the Middle East and North Africa; 11% went to Asian markets; 11%, to European markets; and 4%, to American markets. Alcoa World Alumina L.L.C. (AWA) of the United States supplied Alba with alumina under a long-term agreement. Alba's aluminum smelter consumed 775,000 t of petroleum coke to produce 550,000 t of carbon anode. The smelter, which employed 2,937 people in 2013, had a 2,219-megawatt installed powerplant capacity and the capacity to produce 41,000 cubic meters per day of desalinated water (table 1; Aluminium Bahrain B.S.C., 2014a, b).

AWA, which was owned by Alcoa Inc. (60%) and Alcoa Ltd. (40%), both of the United States, agreed to pay a total of \$223 million, including a fine of \$209 million, payable in five equal installments over 4 years, to Alba. The settlement followed the resolution of an investigation by the U.S. Department of Justice and the U.S. Securities and Exchange Commission concerning the lawsuit that was filed by Alba in 2008 in the Pittsburgh Federal District Court. The lawsuit alleged that Alcoa paid millions of dollars, through an agent, in bribes between 1990 and 2005 to Alba officials to win inflated contracts that resulted in Alcoa gaining more than \$400 million in illegal profits. Alba was seeking more than \$1 billion in damages (Alcoa Inc., 2014; Pearson, 2014).

Bahrain's downstream aluminum industries included Bahrain Aluminium Extrusion Co., which had the capacity to produce 25,000 metric tons per year (t/yr) of flat aluminum products; Aluminium Wheel Co. W.L.L., which had the capacity to produce 400,000 wheel castings per year; Bahrain Alloys Manufacturing Co., which had the capacity to produce 30,000 t/yr of aluminum alloys; Bahrain Atomisers International B.S.C., which produced aluminum powder; Bahrain Recycling Plant, which had the capacity to produce 120,000 t/yr of recycled aluminum products; Gulf Aluminium Rolling Mill Co. B.C.S., which produced 155,000 t/yr of rolled aluminum products; and Midal Cables Ltd., which had the capacity to produce 120,000 t/yr of aluminum cables (table 2).

**Ferroalloys.**—Bahrain Ferro Alloys B.S.C., which was a subsidiary of ETA Star Holdings L.L.C. of the UAE, produced ferrochrome, ferromanganese, and ferrosilicon to meet the demand of local and regional steel producers. The company had the capacity to produce 35,000 t/yr of ferromanganese and 250,000 t/yr of ferrosilicon, as well as an unknown capacity of ferrochrome, from its smelter at the Hidd Industrial Area. Bahrain Ferro Alloys was installing a submerged arc furnace capable of producing different ferroalloys. The smelter's production capacity was expected to double when the additional ferroalloys furnace is completed (Bahrain Ferro Alloys B.S.C., 2014).

**Iron and Steel.**—Foulath owned a majority interest in Gulf Industrial Investment Co. E.C. (GIIC), United Stainless Steel Co. B.S.C. (USCO), and SULB. GIIC, which was established as an integrated iron and steel producer, operated two Allis-Chalmers (grate-kiln) pelletizing plants at the Hidd Industrial Area with a combined production capacity of 11 Mt/yr of iron ore pellets for use in DRI plants. USCO had the capacity to produce 100,000 t/yr of stainless steel from imported black hot-band coils at its plant in the Hidd Industrial Area (table 2; Gulf Industrial Investment Co. E.C., 2013; Universal Rolling W.L.L., 2014).

In 2013, SULB completed building a \$1 billion steel mill at the Hidd Industrial Area. The SULB iron and steel complex's three-module mill included a 1.5-Mt/yr-capacity DRI plant, a melt shop with a combined capacity of 850,000 t/yr of crude steel, and a 600,000-t/yr-capacity heavy-section rolling mill. Production from the complex began in the second quarter of 2013. Universal Rolling W.L.L., which was owned by Bahraini and Saudi investors and the Bahrain-based International Investment Bank, produced steel-reinforcing bar (rebar) from its mill in the Hidd Industrial Area. The production capacity of the mill was 200,000 t/yr of rebar (Universal Rolling W.L.L., 2014; Sulb Co. B.S.C., 2015).

### Industrial Minerals

**Cement.**—Bahrain had one cement plant and one cement grinding mill in 2013. Falcon Cement Co., which was owned by Cemena Holding Company B.S.C. of Bahrain, produced cement at its plant in the Hufaira Industrial Area and had the capacity to produce 1.2 Mt/yr of cement (Falcon Cement Co. B.S.C., 2014). Arabian Gulf Cement Co. W.L.L. Bahrain, which was a subsidiary of Star Cement Co. W.L.L. of the UAE, operated a clinker-grinding mill and had the capacity to produce 400,000 t/yr of cement. Clinker was transferred from the company's other cement plants in the UAE. Star Cement was owned by UltraTech Cement Middle East Investments Ltd. of India (UltraTech Cement Middle East Investments Ltd., 2014).

**Nitrogen (Ammonia), Methanol, and Urea.**—In 2013, GPIC increased its ammonia production by 12%; urea production, by 10%; and methanol output, by 7% compared with those of 2012. GPIC continued construction work for its expansion plan to increase its production capacity to 766,500 t/yr of ammonia and 1.3 Mt/yr of urea. Most of the company's production of methanol and urea was exported, and most of the 461,000 t of ammonia output was used for urea production, whereas the remaining was exported. Ammonia exports, which amounted to about 73,000 t, were sent to Taiwan (27%), China and Australia (19% each), India (18%), and the Republic of Korea (16%). GPIC's methanol exports, which amounted to 447,000 t, went to China (57%), the United States (21%), Singapore (16%), Italy (3%), Thailand (2%), and Latin American countries (1%). GPIC's urea exports went to the United States (52%), Latin America (20%), Thailand (15%), and the remainder (13%) to African countries, Australia, Bangladesh, and the Philippines (Gulf Petrochemical Industries Co. B.S.C., 2014, p. 16, 25).

## Mineral Fuels

**Natural Gas and Petroleum.**—Bahrain's proven crude oil resources were estimated to be 125 million barrels (Mbbbl) and proven natural gas resources 190 billion cubic meters as of yearend 2013. Bahrain produced about 17.5 Mbbbl of petroleum from the Bahrain oilfield, which was operated by Bapco, and 54.6 Mbbbl from Bahrain's 50% share of the Abu Saafa offshore oilfield; the Abu Saafa field was owned jointly by Bahrain and Saudi Arabia and operated by Saudi Arabia Oil Co. Banagas's total natural gas production, which included dry and associated gas, increased to 19.2 billion cubic meters in 2013 from 15.4 billion cubic meters in 2012. The increase was attributable to the completion of the company's series of expansions, which increased the production and processing capacity to 8.5 million cubic meters per day of natural gas from 3.5 million cubic meters per day (table 2; Bahrain Natural Gas Co. B.S.C., 2014).

NOGA's strategic projects included exploration for natural gas in the deep layers of the Bahrain oilfield; exploration and production in the marine areas of Block 1, which is located north of Bahrain; exploration and production in Blocks 3 and 4, which are located southeast of Bahrain Island; and conducting research on the most effective ways for consuming natural gas. The Government created Skaugen Gulf Petchem Carriers, which was a joint venture of I.M. Skaugen S.E. of Norway and NOGA Holdings (35% interest each) and Capital Management House (30% interest) to transport liquefied petroleum gas and liquefied natural gas (LNG). The Government was building an LNG import terminal to accommodate its imports of 14.2 million cubic meters per year of natural gas. In 2013, Bloc, which was a majority state-owned company, produced lubricating oil at its plant. The plant was considered the first of its kind in the region and had the capacity to produce 2.8 Mbbbl/yr of high-viscosity index group III lubricant base oils.

Tatweer Petroleum moved forward with three crude oil and natural gas exploration and production projects. The projects would include exploration for natural gas in the deep layers of the Bahrain field; exploration and production in the marine areas of Block 1, which is located in northern Bahrain; and exploration and production in Blocks 3 and 4 in cooperation with Occidental Petroleum (National Oil and Gas Authority, 2013, p. 16).

Bapco planned to increase the production capacity at its oil refinery in Sitra to 330,000 barrels per day (bbl/d) from 265,000 bbl/d. The expansion project was expected to cost between \$6 billion and \$8 billion to build and be completed by 2019. Bapco moved forward with the engineering work for a pipeline that would transport crude oil from Saudi Arabia to the Sitra refinery in Bahrain. The pipeline would be more than 100 kilometers long and would cost \$350 million to build. Construction was expected to be completed in 2015 (Bloomberg L.P., 2013; National Oil and Gas Authority, 2013, p. 17).

## Outlook

Bahrain is likely to remain an important world supplier of aluminum, ammonia, and urea as well as regional supplier of DRI, ferroalloys, and pelletized iron ore. The Government, which received \$10 billion in financial assistance in 2011 from

the other GCC countries for 10 years, is planning to invest about \$1 billion in infrastructure and housing projects in 2014.

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

(Thousand metric tons unless otherwise specified)

Commodity <sup>2</sup>	2009	2010	2011	2012	2013
METALS					
Aluminum metal, primary	848	851	881	890	913
Ferromanganese	5,700	5,600	35,300	35,000	35,000
Ferrosilicon	6,500	3,700	3,000	3,000	3,000
Iron and steel:					
Direct-reduced iron	--	--	--	--	780
Iron ore pellets <sup>3</sup>	3,286	8,000	11,000	11,000	11,000
Stainless steel <sup>c</sup>	90,000	90,000	90,000	90,000	90,000
Steel-reinforcing bar <sup>e</sup>	200,000	200,000	200,000	200,000	200,000
INDUSTRIAL MINERALS					
Cement	700	700	800	800	1,200
Nitrogen:					
N content of ammonia	390	357	380	341	378
N content of urea	332	290	310	288	316
Sulfur <sup>e</sup>	72	137	132	135	135
MINERAL FUELS AND RELATED MATERIALS					
Gas, natural:					
Gross	15,388	15,762	15,641	15,370 <sup>r</sup>	19,249
Dry	12,700 <sup>r</sup>	12,800 <sup>r</sup>	13,100 <sup>r</sup>	13,700 <sup>r</sup>	15,800
Methanol	410	417	443	416	446
Natural gas plant liquids:					
Butane	907	937	908	900	985
Naphtha	1,730	1,835	1,760	1,800	1,898
Propane	953	1,000	990	1,000	1,058
Petroleum:					
Crude <sup>4</sup>	66,510	66,376	69,452	63,302	72,123
Refinery products:					
Liquefied petroleum gas	365	548	584	600	600
Gasoline	7,600	7,600	6,205	7,000	7,000
Kerosene and jet fuel	1,716	1,606	1,168	1,600	1,600
Distillate fuel oil	32,120	31,755	28,470	32,000	32,000
Residual fuel oil <sup>c</sup>	15,330	15,330	16,279	18,000	18,000
Other <sup>e</sup>	38,377	42,523	43,320	41,903	40,763
Total	95,508	99,362	96,026	101,103	99,963

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through June 30, 2014.

<sup>2</sup>Aggregate, ferrochrome, rock, and sand are also produced, but available information is inadequate to make reliable estimates of output.

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

<sup>4</sup>Includes Bahrain's share of production from the Abu Saafa field.

TABLE 2  
BAHRAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Aluminum:</b>				
<b>Metal:</b>				
Primary and secondary		Aluminium Bahrain B.S.C. (Bahrain Mumtalakat Holding Co., 69.38%; SABIC Industrial Investments Co. Ltd., 20.62%; others, 10%)	Smelter at Sitra	912,000
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	155,000
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 Aluminium Extrusion Co.	do.	25,000
Casting	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	1,200,000
<b>Iron and steel:</b>				
Direct-reduced iron		United Steel Co. B.S.C.	Hidd Industrial Area	1,500,000
Iron ore, pellets		Gulf Industrial Investment Co. E.C. (Gulf United Steel Holding Co., 100%)	Pellet plant at Hidd	11,000,000
Crude steel		United Steel Co. B.S.C.	Hidd Industrial Area	850,000
Heavy sections		do.	do.	600,000
Steel, stainless, rolled		Universal Rolling W.L.L.	do.	100,000
Hot-rolled		United Stainless Steel Co. B.S.C. (Gulf United Steel Holding Co., 100%)	do.	100,000
Ferroalloys		Bahrain Ferro Alloys B.S.C. (ETA Star Holding L.L.C., 100%)	do.	55,000
Methanol		Gulf Petrochemical Industries Co. B.S.C. (National Oil and Gas Authority, 33.3%; Petrochemical Industries Co., 33.3%; Saudi Basic Industries Corp., 33.3%)	Sitra	450,000
<b>Natural gas:</b>				
Extracted	million cubic meters	Bahrain Petroleum Co., B.S.C. (Closed) (National Oil and Gas Authority, 100%)	Bahrain field, Awali	13,900
<b>Liquids:</b>				
Butane	thousand 42-gallon barrels	Bahrain National Gas Co. B.S.C. (National Oil and Gas Authority, 75%; Arab Petroleum Investment Corp., 12.5%; Caltex Bahrain, 12.5%)	Natural gas plant at Awali	1,100
Naphtha	do.	do.	do.	1,020
Propane	do.	do.	do.	1,800
<b>Nitrogen:</b>				
Ammonia		Gulf Petrochemical Industries Co. B.S.C. (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 2013

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Petroleum:</b>				
Synthetic coke		Aluminium Bahrain B.S.C. (Bahrain Mumtalakat Holding Co., 69.38%; SABIC Industrial Investments Co. Ltd., 20.62%; others, 10%)	Sitra	600,000
Crude	thousand 42-gallon barrels	Saudi Arabian Oil Co.	Abu Saafa field, offshore	93,400 <sup>1</sup>
Do.	do.	Bahrain Petroleum Co., B.S.C. (Closed) (National Oil and Gas Authority, 100%)	Bahrain field, Awali	17,500
Refinery products	do.	do.	Sitra	265,000
Lube oil	do.	Bahrain Lube Base Oil Co. [National Oil and Gas Authority, 55%; Bahrain Petroleum Co., B.S.C. (closed), 27.5%; Neste Oil Corp., 27.5%]	do.	2,800
Sulfur		Bahrain Petroleum Co., B.S.C. (closed) (National Oil and Gas Authority, 100%)	do.	135,000

Do., do. Ditto. NA Not available.

<sup>1</sup>Production is pumped to Bahrain and subsequently refined and marketed by Bahrain Petroleum Co.