

# THE MINERAL INDUSTRY OF

# BAHRAIN

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The mineral industry of Bahrain supplied more than 90% of Government revenues and export earnings in 1996. Crude oil from Bahrain's Awali Field was supplemented by shared production from the Abu Saafa offshore field that straddles the territorial waters of Bahrain and Saudi Arabia. In early 1996, Saudi Arabia assigned to Bahrain the total production from the Abu Saafa Field commencing April 1, 1996. The availability of natural gas, principally from the Khuff reservoir, for electric power generation has fostered the Nation's aluminum smelting and fabrication industries for a quarter of a century. Feedstock for the aluminum plant was imported with about 75% of the alumina supply obtained from Alcoa of Australia. Aluminium Bahrain's (ALBA) smelter at 460,000 metric tons per year (t/yr) capacity is the largest in the Middle East.

Production of the nation's mineral commodities for the most part has stabilized. Output of crude petroleum has been maintained at nearly 15 million barrels per year sustained by natural gas injection; it is expected to continue near this level throughout this decade. Unless additional reserves are identified, domestic onshore production is expected to cease by 2000.

ALBA has operated at near-capacity levels throughout the decade. However, production targets were temporarily reduced in 1993 and part of 1994 to support world aluminum prices. (See table 1.) Billet and rolling slab represent about 40% of production.

Aluminum accounted for more than one-fourth of total exports by value in 1996. Nearly two-thirds of the exported aluminum was delivered to member countries of the Gulf Cooperation Council (GCC).

Combined exports of methanol and ammonia were 870,500 metric tons (t) in 1996. All production was exported to markets principally in Asia and Western Europe. A 1,700-metric-ton-per-day (t/d)-capacity urea plant is scheduled to commence production by yearend 1997. Therefore, ammonia exports are likely to fall substantially in 1998 in favor of providing feedstock to the urea plant.

Bahrain's oil and natural gas industry was wholly Government-owned, and most other mineral commodity ventures were Government-controlled. However, private domestic and foreign investment was being encouraged by allowing fully foreign-owned companies to register in Bahrain. The Bahrain Aluminium Extrusion Co. (Balexco), formerly wholly owned by the Government, has been totally privatized. It was the first state-owned company offered for privatization.

A 36,500 t/yr expansion program was underway, elevating the ALBA aluminum smelter's capacity to 496,500 t. The expansion involved extending the third potline by 76 cells and

is scheduled for completion in May 1997. Additional production would be absorbed by increasing demand from downstream industries in Bahrain and the GCC. This includes Balexco where expansion to 21,000 t/yr was effected with the commissioning of a third extrusion line in 1996. The Bahrain Alloys Manufacturing Co. uses molten aluminum from the Alba smelter to manufacture foundry alloys for the automotive and aerospace industries with markets principally in Europe.

The Gulf Aluminum Rolling Mill Co., Bahrain's coil and sheet producer for the construction and foil industry, tripled capacity to 120,000 t/yr in 1996. Raytheon Co. of the United States was the consultant for the expansion engineering work.

The bulk of Bahrain's natural gas production is extracted from the Khuff Zone. Only 23% of the natural gas supply is derived from associated gas in the Awali Field. More than one-fourth of total natural gas production was injected for enhanced recovery operations necessary to maintain petroleum production at the Awali Field. The remaining output was utilized in the production of electric power and as a petrochemical feedstock.

Gulf Petrochemical Industries Co. (GPIC), a joint venture between Bahrain and Kuwait, operated an ammonia and methanol plant at Sitra producing more than 400,000 t/yr of each commodity in recent years. The petrochemical use of natural gas was approximately 1.2 billion cubic meters in 1996. GPIC has awarded a construction contract for its 1,700 t/d urea plant, which will consume 80% of GPIC's ammonia output. Total cost of the project is estimated at just under \$140 million.

The 250,000 barrels-per-day (bbl/d) capacity refinery at Sitra has consistently operated at or above capacity. About 84% of the refinery's throughput was delivered by pipeline from Saudi Arabia and the remainder from the Awali Field. The domestic demand for petroleum products exceeded 10,000 bbl/d, with the remaining output destined for the export market.

Proven crude oil reserves were estimated at 60 billion barrels and natural gas reserves were estimated at about 170 billion cubic meters.

The island Nation's basic infrastructure is in place, including a network of petroleum pipelines and storage facilities to accommodate Sitra refinery receipts from the Awali Field and the Abu Saafa Field shared with Saudi Arabia. In addition, 16 product pipelines extend for 5 kilometers (km) from the Sitra refinery storage facilities to a deepwater terminal for export. Natural gas pipelines servicing Bahrain's power generation and industry complexes totaled 32 km in length.

The Directorate of Electricity operates plants at Manama, Sitra, and Rifaa. Their combined capacity is 992 megawatts (MW). An additional 200 MW from Alba's 800-MW

powerplant is available. Bahrain Petroleum Co. also produces its own electricity from a 60-MW plant.

### **Major Sources of Information**

Ministry of Industry and Development

Manama, Bahrain

Bahrain National Oil Co.

P.O. Box 25504

Awali, Bahrain

Telephone: (973) 754 666

Fax: (973) 753 203

Bahrain Petroleum Co.

Awali, Bahrain

Telephone: (973) 754 444

Fax: (973) 752 924

Bahrain National Gas Co.

P.O. Box 29099

Rifaa, Bahrain

Telephone: (973) 756 222

Fax: (973) 756 991

Caltex Bahrain

P.O. Box 25125

Awali, Bahrain

Telephone: (973) 753 134

Fax: (973) 753 122

Harken Bahrain Oil

P.O. Box 11715

Manama, Bahrain

Telephone: (973) 531 735

Fax: (973) 536 592

Aluminium Bahrain (ALBA)

P.O. Box 570

Manama, Bahrain

Telephone: (973) 661 751

TABLE 1  
BAHRAIN: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1992	1993	1994	1995	1996 e/
Aluminum, smelter output, primary metal	292,400	447,514	447,000	450,709	461,245 2/
Cement	220,000	225,000	225,000	196,568 r/	193,000
Gas, natural:					
Gross million cubic meters	9,415 r/	9,798 r/	9,946	12,538 r/	12,700
Dry do.	4,015	6,926	7,091	7,205 r/	6,950
Methanol	413,691	428,458	419,322	427,350	384,558 2/
Natural gas plant liquids:					
Propane thousand 42-gallon barrels	1,608	1,471	1,455 r/	1,375 r/	1,087 2/
Butane do.	1,236	1,116	1,190 r/	1,163	1,272 2/
Naphtha do.	1,848	1,800	1,863	1,848	1,784 2/
Nitrogen: N content of ammonia	332,800	348,375	337,506	357,504	358,000
Petroleum:					
Crude thousand 42-gallon barrels	15,123	14,875	14,695	14,468	14,124
Refinery products:					
Gasoline do.	8,500 r/	9,228 r/	7,704	7,766	8,134
Jet fuel do.	7,500	4,410	7,106	6,219	6,200
Kerosene do.	10,500	12,282	10,409	11,327	11,300
Distillate fuel oil do.	28,000	29,360	28,852	31,027	31,050
Residual fuel oil do.	23,500	22,188	20,896	20,807	20,800
Other do.	16,300	12,190	13,630	14,728 r/	14,730
Total do.	94,300 r/	89,658 r/	88,597	91,874 r/	92,214
Sulfur	56,600 r/	53,700 r/	52,312 r/	55,390 r/	6,520

e/ Estimated. r/ Revised.

1/ Table includes data available through May 1, 1997.

2/ Reported figure.