

THE MINERAL INDUSTRY OF

QATAR

By Bernadette Michalski

Although crude oil continued to be Qatar's principal mineral commodity in 1997, it will be eclipsed by natural gas production from the North Field by 2000. The North Field is the largest known offshore nonassociated gasfield in the world with recoverable reserves of 7 trillion cubic meters in a 6,000-square-kilometer area in shallow waters off the Qatari northeast peninsula (Arab Petroleum Research Center, 1998). For the present, Qatar's economy remains largely dependent on the oil industry, which accounted for nearly 80% of total exports, 65% of Government revenues, and 37% of the gross domestic product in 1997.

Production of nonfuel minerals, such as cement and fertilizer materials, have grown; steel production, however, declined slightly. A 2,000-metric-ton-per-day (t/d)-capacity cement plant was inaugurated at Umm Bab in 1997. The existing 330,000-metric-ton (t)-capacity cement plant at the same location will be gradually phased out owing to obsolescence. (See table 1.)

The country's major trading partners are Brazil, the European Community, the Gulf Cooperation Council (GCC) nations, Japan, the Republic of Korea, and the United States. Qatar imported pelletized iron ore from Bahrain and raw materials for the steel and construction industries from the European Community, Japan, and the United States. Other imports from the United States included power-generating machinery and equipment; nonferrous metals, such as copper and copper alloys; aluminum semimanufactures; zinc and zinc alloys; vehicles; and heavy machinery. In 1997, total imports were valued at \$5 billion and exports of all commodities totaled \$5.8 billion (Arab Petroleum Research Center, 1998).

Construction of a 240,000-metric-ton-per-year-capacity aluminum smelter is under consideration as a joint venture between Qatar and Norsk Hydro ASA of Norway. The \$1 billion smelter's completion is anticipated in 2002. The raw material, alumina, is to be supplied by India (Platt's Metals Week, 1998).

Almost all the output (90%) from Qatar Steel Co. Ltd. (QASCO) was exported, mostly to the GCC countries. QASCO remained 70% owned by the Government, with 30% held by two Japanese companies; Kobe Steel, Ltd. (20%), and Tokyo Boeki (10%). Qatar was negotiating with the Japanese firms for the purchase of their 30% equity. QASCO has embarked on a \$275 million two-stage expansion program that would increase its capacity to 1.2 million metric tons per year (Mt/yr).

The Qatar Hot Briquetted Iron Company Ltd. was on schedule in the development of a 2-Mt/yr-capacity, \$400 million hot-molded briquetted iron plant to be inaugurated by 2000. QASCO held 31% equity; Gulf Investment Company, Kuwait National Industrial Company, and Duferco International Investment Company Ltd. each held 16 1/3%; Qatar Industrial

Manufacturing Company and Qatar Shipping Company, each held 10%. Ore supply contracts for the plant have reportedly been signed with Companhia Vale do Rio Doce of Brazil and Luossavarra-Kiirunavaara AB of Sweden. About 40% of the hot briquetted iron production is to be absorbed equally by QASCO and Kuwait National. Duferco will absorb the remaining 60%. (Qatar Hot Briquetted Iron Company Ltd., May 6, 1998, accessed on November 10, 1998, at URL <http://www.midrex.com/main/recentnews/Quabicoprrelease.htm>).

Qatar Fertilizer Company (QAFCO), the sole producer of fertilizer, was a 75%-25% joint venture of Qatar General Petroleum Corporation (QGPC) and Norsk Hydro, respectively. QAFCO III, a 1,500-metric ton per day (t/d)-ammonia and a 2,000-t/d urea plant was completed in 1997. Total annual capacity at the ammonia plants was raised from 750,000 metric ton (t) to 1.3 million tons (Mt) and at the urea plants, from 820,000 t to 1.55 Mt. Other components of the project included an ammonia tank farm with an annual capacity of 20,000 t, a 100,000-t urea storage facility, a desalination plant, and a 42-megawatt (MW) powerplant. A feasibility study is being conducted on a possible fourth fertilizer complex with 1,500 t/d of ammonia capacity and 2,000 t/d of urea capacity (Chemical Week, 1997).

The Government accelerated measures to attract foreign and local investors to participate in the economy, particularly in the natural gas industry. The Government, through QGPC, was involved in two major liquefied natural gas (LNG) ventures with foreign partners; both were at Ras Laffan, the nearest landfall to the offshore North Field. Qatar Liquefied Gas Co. (QATARGAS) is owned by QGPC (65%), Total SA of France and Mobil Oil of the United States (each 10%), and Marubeni Corp. and Mitsui & Co. of Japan (each 7.5%). The first 2-Mt/yr-capacity train was commissioned in 1996; the second, in early 1997; and the third is to be commissioned in 1999. QATARGAS secured a 25-year supply contract with a Japanese power company calling for the delivery of 4 Mt/yr of LNG. The Chubu Electric Power Co. received the first shipment (59,000 t) at the LNG reception terminal at Kawagoe, Japan, on January 10, 1997. The contract calls for the delivery of 2 Mt in 1997, 2.5 Mt in 1998, 3 Mt in 1999, and 4 Mt, the full contractual annual volume, in effect from 2000. A second contract was secured with a consortium of seven Japanese companies to offtake an additional 2 Mt/yr during a 25 year period beginning in 1999. In May 1997, QATARGAS concluded a short-term contract with Enagas of Spain for 320,000-t of LNG for delivery between 1997 and 1998.

A second LNG venture, the Ras Laffan LNG Co. (RASGAS) is owned by QGPC (66.5%), Mobil (26.5%), Itochu Corp. (4%), and Nissho Iwai Co. (3%). RASGAS is developing a 5-Mt/yr-capacity

LNG plant at Ras Laffan, which is scheduled to come on-stream in mid-1999 and begin full operation by 2002. An agreement was concluded with Korea Gas in June 1997 to double the volume of LNG exports initiated in an earlier agreement from 2.4 to 4.8 Mt/yr during a 25 year period. The agreement calls for 600,000 t of LNG to be delivered in 1999, increasing to the contractual maximum of 4.8 Mt in 2002. Qatar was in various stages of negotiations with India, Lebanon, and Turkey as other possible outlets for RASGAS LNG. Should these negotiations materialize into firm contracts, RASGAS plans to double its capacity and export about 10 Mt/yr by 2005.

Crude oil production increased significantly in 1997, averaging 614,000 barrels per day (bbl/d) compared with 510,000 bbl/d in 1996. Increased output from Al-Shaheen and the newly commissioned Al-Khaleej Field accounted for the rapid rise in production. Al-Shaheen, operated by Maersk Oil Qatar of Denmark, produced around 60,000 bbl/d in mid-1997, climbing to 100,000 bbl/d by the close of the year. Maersk plans to increase production to 150,000 bbl/d by 2000. Located in Block-5 about 70 kilometers (km) off Qatar's northeastern coast, Al-Shaheen produces a sour (29°-33° API) oil with 1.7%-2% sulfur. The field will also produce approximately 100 million cubic feet per day of associated gas.

Qatar has initiated a number of new policies to increase oil production, to locate additional oil reserves before existing reserves become too expensive to recover, and to invest in advanced oil recovery systems to extend the life of existing fields. To accomplish this, the Government has, in recent years, improved the terms of exploration and production contracts and production-sharing agreements. During the next several years, \$27 billion will be invested to expand hydrocarbon production capacities in Qatar's upstream and downstream sectors. Of the \$27 billion, more than half, or about \$17.8 billion, will come from foreign companies. As a result, Qatar has become one of the world's most active drilling centers. At any given time, up to 15 rigs are working in Qatar's oil and gas-fields, and 177 new wells are being drilled for oil and gas development projects.

The National Oil Distribution Co., a subsidiary of QGPC, operates the nation's sole refinery. The 63,000-bbl/d-capacity Umm Said Refinery was undergoing upgrading, increasing distillation capacity to 80,000 bbl/d.

Proven reserves of crude oil are considered to be between 3.7 billion and 5 billion barrels. Natural gas reserves are estimated to be 8.5 trillion cubic meters (Arab Petroleum Research Center, 1998).

There were 235 km of petroleum and 400 km of natural gas pipelines running east to west from Doha to Dukhan and from Umm Said through Umm Bab to Dukhan. Other pipelines also linked offshore fields in the Arabian Gulf to Umm Said. Hydrocarbons were exported from five terminals--Halul Island, which served the offshore fields; Umm Said, which served the

onshore fields; Ras Abu Abbud and Abu Hamur, which were terminals for refined products, and the Ras Laffan LNG terminal, which includes a 9-km quay and has the capacity to load 28 Mt/yr of LNG.

Qatar currently has an electric generation capacity of 1,400 MW, and produces 5.2 billion kilowatt-hours of electricity. The residential sector accounts for 80% of Qatar's electricity consumption. In March 1998, the Qatari Government took a small step towards privatizing of its power sector. The Ministry of Electricity and Water, which controls virtually all the country's powerplants, agreed to transfer operation and maintenance responsibilities to the Ras Abu Fontas-B plant to the Qatar Electricity & Water Company (QEWC). QEWC controlled by local investors (57%) and the Government (43%). The Ras Abu Fontas B-plant is the country's largest and newest power and water desalination plant. It has an electric generation capacity of 650 MW and water output of 33 million gallons per day. The operation and maintenance responsibilities are scheduled to be transferred to QEWC in July 1998.

The North Field natural gas projects continue to be given top priority, and if they attain their full development by 2010, as planned, they should underwrite Qatar's economic well being through the next century. Other mineral industry projects may be in a more-tenuous position in the near term as Government oil revenues decline owing to persistently low world oil prices. The petroleum refining and petrochemical, the aluminum and iron and steel, the electric power, and the desalination projects now under development may be delayed until revenues from the LNG program can be realized or world oil prices improve.

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Major Sources of Information

- Qatar General Petroleum Corp.
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TABLE 1
QATAR: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1993	1994	1995	1996	1997
Cement, hydraulic	544,000	469,502	475,380	690,000 r/ e/	700,000 e/
Gas, natural:					
Gross million cubic meters	18,400	18,300	18,800	18,950 r/	27,000
Dry do.	13,500	13,500	13,600	13,700 r/	21,500
Iron and steel, metal:					
Direct-reduced iron thousand tons	601	610	622	632	570
Steel, crude do.	620	572	614	626	616
Semimanufactures:					
Billet do.	609	610	606	617	608
Bars do.	590	600	601	601	596
Natural gas liquids e/ thousand 42-gallon barrels	18,200 3/	18,200	18,500	21,000	22,000 3/
Nitrogen:					
N content of ammonia	627,200	646,055	653,462	635,027	942,500
N content of urea	379,600	394,600	407,500	400,300	490,400
Petroleum:					
Crude thousand 42-gallon barrels	142,000	138,200	142,300	186,150 r/	224,110
Refinery products:					
Gasoline do.	3,350	4,661	4,441	3,942 r/	4,000 e/
Kerosene do.	2,845	3,377	3,217	3,321 r/	3,350 e/
Distillate fuel oil do.	4,890	5,480	5,126	6,997 r/	7,000 e/
Residual fuel oil do.	5,730	6,278	6,064	6,860 r/	6,900 e/
Other do.	1,240	1,000	900	1,100 r/	1,100 e/
Total do.	18,055	20,796	19,748	22,220 r/	22,350 e/
Stone, limestone e/ thousand tons	900	900	900	900	900
Sulfur e/	72,000 r/	62,000 r/	50,000 r/	45,000 r/	65,000
Urea	825,000	858,000	886,000 e/	870,000	875,000 e/

e/ Estimated. r/ Revised.

1/ Table includes data available through November 1, 1998.

2/ In addition to commodities listed, clays, gypsum, and sand and gravel for construction purposes are produced, but available information is inadequate to make reliable estimates of output levels.

3/ Reported figure.