



# 2007 Minerals Yearbook

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**QATAR [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRY OF QATAR

By Philip M. Mobbs

Hydrocarbons dominated the economy of Qatar. Natural gas and petroleum accounted for about 56% of the gross domestic product (GDP) at current prices. The manufacturing sector, which included the production of cement, fertilizers, and steel, and the refining of petroleum, accounted for about 8% of the GDP. Of Qatar's total exports in 2007, crude petroleum and petroleum products accounted for about 50%; natural gas, 40%; fertilizer (urea), 2.1%; iron and steel products, 1.0%; and other mineral commodities, such as ammonia and helium, 0.6% (Qatar National Bank S.A.Q., 2008, p. 10, 34).

Most of Qatar's natural gas and helium resources were located in the offshore North Field, which was the world's largest nonassociated natural gas field. About 25% of the world's helium resources and 15% of the world's natural gas resources were located within Qatar's territory. Qatar accounted for 2% of the world's natural gas output and 1% of the world's ammonia production (U.S. Department of Energy, 2007; BP p.l.c., 2008, p. 24; Kramer, 2008; Pacheco, 2008).

## Production

In 2007, the large increase in the production of cement was attributed to a full year of production at Qatar National Cement Co.'s plants no. 2 and no. 3, which were completed in late 2006. Increases in the volume of direct-reduced iron (DRI), crude steel, and rolled steel bar output was attributed to the successful completion of a \$575 million Phase 1 expansion project of Qatar Steel Co. Q.S.C. (QASCO). The increase in helium output corresponded to the continued rampup of the helium recovery unit at Ras Laffan, which started production in 2005.

## Structure of the Mineral Industry

The Government held direct or indirect interest in much of the country's mineral industry. Qatar Petroleum was a 100% state-owned company. Qatar Petroleum held majority interest in Industries Qatar Q.S.C., Oryx GTL Ltd., Qatar Liquefied Gas Co. Ltd., Qatar Liquefied Gas Co. Ltd. (II), Qatar Liquefied Gas Co. Ltd. (III), Ras Laffan Liquefied Natural Gas Co. Ltd. (I), Ras Laffan Liquefied Natural Gas Co. Ltd. (II), and Ras Laffan Liquefied Natural Gas Co. Ltd. (III). Crude oil was produced by Qatar Petroleum or under production-sharing agreements with Qatar Petroleum. Industries Qatar held the majority interest in QASCO, Qatar Fertilizer Co. S.A.Q. (Qafco), and Qatar Fuel Additives Co. Ltd. Q.S.C.

## Commodity Review

### Metals

**Aluminum.**—The construction of a \$5.6 billion 585,000-metric-ton-per-year (t/yr)-capacity facility for Qatar Aluminium Ltd. (Qatalum) began in 2007. Originally estimated to cost

\$4.8 billion, the plant's estimated construction and engineering costs had risen by about 16% since 2005, owing in part to the construction boom in the region. Qatalum's initial production was scheduled for 2009, and the plant's output was expected to reach full capacity by 2010. The facility was designed to allow expansion of the plant's capacity to 1.2 million metric tons per year (Mt/yr) (Norsk Hydro ASA, 2007, p. 11; Qatar Petroleum, 2007).

**Iron and Steel.**—QASCO produced 1.17 million metric tons of crude steel in 2007. QASCO also commissioned a hot-discharge combination DRI and hot-briquetted iron plant, a 666,000-t/yr-capacity electric arc furnace (EAF), a 615,000-t/yr-capacity continuous-casting machine, and a 700,000-t/yr-capacity reinforcing-bar rolling mill (Qatar Steel Co. Q.S.C., 2008, p. 13, 20).

QASCO proposed to increase crude steel output to 4 Mt/yr by 2013. In 2007, the company started work on its Phase 2 expansion, which included a fourth EAF, an associated 1.2-Mt/yr-capacity continuous casting unit, and an 800,000-t/yr-capacity reinforcing-bar rolling mill (Qatar Steel Co. Q.S.C., 2008, p. 13).

### Mineral Fuels

**Natural Gas.**—In 2007, Sasol Ltd. started production of diesel fuel and natural gas liquids from the 34,000-barrel-per-day (bbl/d)-capacity Oryx natural gas-to-liquid (GTL) plant. Royal Dutch Shell plc of the Netherlands, under a development and production-sharing agreement with the Government, initiated construction of the \$12 billion to \$18 billion two-train 140,000-bbl/d-capacity Pearl GTL plant. In 2003, initial estimates placed the cost of the project at about \$5 billion. The Pearl GTL facility, which was expected to begin production from one train by 2010 and from the second train by 2011, also was designed to recover about 120,000 bbl/d of natural gas liquids (Middle East Economic Digest, 2008a; Petroleum Economist, 2008; U.S. Securities and Exchange Commission, 2008, p. 31, 41).

In February 2007, Exxon Mobil Corp. withdrew from the 154,000-bbl/d-capacity Palm GTL project with Qatar Petroleum after the estimated cost of the GTL project reached \$18 billion. The Palm GTL plant's construction had been estimated to cost about \$7 billion in 2004. ExxonMobil and Qatar Petroleum subsequently announced plans to develop the offshore natural gas resources formerly assigned to the Palm project as the 42.5-million-cubic-meter-per-day-capacity Barzan gas project. The Barzan project, which was expected to begin production in 2012, would supply natural gas for domestic industrial projects (Middle East Economic Digest, 2007b).

### Outlook

Numerous mineral projects were planned or underway. While the construction of some of the proposed mineral

facilities in Qatar has been cancelled because of skyrocketing construction, engineering services, labor, and material costs, most of the proposed projects are expected to be completed. Qatargas Operating Co. proposed the construction of a new 4.2-Mt/yr-capacity sulfur project. Newly established Gulf Cement Co. proposed to build a 1.8-Mt/yr-capacity cement plant at Umm Bab by 2009. Qafco awarded a construction contract for the expansion of its fertilizer facility at Mesaieed by an additional 555,000 t/yr of urea and 350,000 t/yr of ammonia by 2010. Qafco also proposed another expansion (Qafco VI) of its facilities by 2015 with the addition of a 1-Mt/yr-capacity urea plant and a 660,000-t/yr-capacity ammonia plant (Middle East Economic Digest, 2007a, c, d).

Ongoing liquefied natural gas (LNG) projects of the partnerships of Qatar Liquefied Gas Co. Ltd. and Ras Laffan Liquefied Natural Gas Co. Ltd. would add more than 46-Mt/yr of capacity to Qatar's existing 31.1-Mt/yr LNG capacity. Qatar Petroleum issued a contract for the design of a 200,000-bbl/d-capacity crude oil refinery at Al-Shaheen. Initial petroleum product output was expected in 2011 (table 2; Middle East Economic Digest, 2007e; 2008b).

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TABLE 1  
QATAR: ESTIMATED PRODUCTION OF MINERAL COMMODITIES<sup>1,2</sup>

(Metric tons unless otherwise specified)

Commodity <sup>3</sup>	2003	2004	2005	2006	2007
Cement, hydraulic	1,400,000	1,400,000	1,400,000	1,568,000 <sup>r,4</sup>	2,500,000
Gas, natural:					
Gross million cubic meters	40,000	50,000	59,000	63,000	63,000
Dry do.	31,400	39,200	45,800	49,500	49,500
Helium thousand cubic meters	--	--	200 <sup>r</sup>	4,400 <sup>r</sup>	5,500
Iron and steel:					
Direct-reduced iron	780,000	830,359 <sup>4</sup>	815,382 <sup>4</sup>	876,885 <sup>4</sup>	1,296,000 <sup>4</sup>
Steel, crude	1,054,000 <sup>4</sup>	1,089,000 <sup>4</sup>	1,057,000 <sup>4</sup>	1,039,138 <sup>4</sup>	1,174,917 <sup>4</sup>
Semimanufactures:					
Billet, cast	1,020,000 <sup>r</sup>	1,050,000 <sup>r</sup>	1,020,000 <sup>r</sup>	1,013,000 <sup>r,4</sup>	1,146,684
Bars, rolled	747,000 <sup>4</sup>	782,000 <sup>4</sup>	791,000 <sup>4</sup>	729,916 <sup>4</sup>	958,156 <sup>4</sup>
Methanol	825,000	840,000	900,000	903,000	884,000
Natural gas liquids thousand 42-gallon barrels	60,000	75,000	100,000	110,000 <sup>r</sup>	140,000
Nitrogen:					
N content of ammonia	1,185,300 <sup>4</sup>	1,428,000 <sup>4</sup>	1,753,984 <sup>4</sup>	1,784,000 <sup>r,4</sup>	1,800,000 <sup>4</sup>
N content of urea	800,000	1,040,000 <sup>4</sup>	1,388,121 <sup>4</sup>	1,356,000 <sup>r,4</sup>	1,381,000 <sup>4</sup>
Petroleum:					
Crude thousand 42-gallon barrels	260,000	270,000	280,000	295,000 <sup>r</sup>	299,000
Refinery products:					
Gasoline do.	14,900	15,000	16,500	16,500	16,500
Kerosene do.	7,370	7,500	8,000	8,000	8,000
Distillate fuel oil do.	7,370	7,500	8,000	8,000	8,000
Residual fuel oil do.	2,880	2,800	2,400	2,400	2,400
Other do.	70,000	70,000	80,000	80,000	80,000
Total do.	103,000	103,000	115,000	115,000	115,000
Stone, limestone	950,000	1,000,000	1,000,000	1,100,000	1,100,000
Sulfur	300,000	360,000	360,000	250,000	240,000

<sup>r</sup>Revised. -- Zero.

<sup>1</sup>Estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Table includes data available through September 12, 2008.

<sup>3</sup>In addition to the commodities listed, clays, dolomite, gypsum, lime, sand and gravel, and shale are produced, but available information is inadequate to make estimates of output.

<sup>4</sup>Reported figure.

TABLE 2  
QATAR: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Qatar Aluminium Ltd. (Qatar Petroleum, 50%, and Norsk Hydro ASA, 50%)	Mesaieed	585 <sup>1</sup>
Cement:				
Portland		Qatar National Cement Co. (Government, 43%)	Kilns and mills at Umm Bab	2,500
Do.		Al-Jabor Cement Industries Co.	Clinker grinding mill at Mesaieed	165
White		Qatari Saudi Company for Industrial Transformation	do.	165
Helium		Joint venture of Qatar Liquefied Gas Co. Ltd., Ras Laffan Liquefied Natural Gas Co. Ltd., and Ras Laffan Liquefied Natural Gas Co. Ltd. (II)	Ras Laffan	2,800
Iron and steel:				
Iron, direct reduction		Qatar Steel Co. Q.S.C. (Industries Qatar Q.S.C., 100%)	Mesaieed	2,400
Steel, crude		do.	Plant at Mesaieed	1,470
Steel, rolled		do.	Rolling mill at Mesaieed	1,440
Lime		Qatar National Cement Co. (Government, 43%)	Kilns at Umm Bab	28
Methanol		Qatar Fuel Additives Co. Ltd. Q.S.C. (Industries Qatar Q.S.C., 50%; OPIC Netherlands Antilles N.V., 20%; Lee Chang Yung Chemical Industry Corp., 15%; International Octane Ltd., 15%)	Mesaieed	825
Natural gas:				
Extracted	billion cubic meters	Qatar Liquefied Gas Co. Ltd. (Qatar Petroleum, 65%; Total S.A., 20%; ExxonMobil Qatargas Inc., 10%; Mitsui & Co., Ltd., 2.5%; Marubeni Corp., 2.5%)	North Field, offshore	20
Do.	do.	Ras Laffan Liquefied Natural Gas Co. Ltd. (I) (Qatar Petroleum, 63%; ExxonMobil Rasgas, Inc., 25%; Korea Gas Corp., 5%; Itochu Corp., 4%; LNG Japan Corp., 3%)	do.	11
Do.	do.	Qatar Petroleum (Government, 100%)	do.	1
Liquefied		Qatar Liquefied Gas Co. Ltd. (Qatar Petroleum, 65%; Total S.A., 10%; ExxonMobil Qatargas Inc., 10%; Mitsui & Co., Ltd., 7.5%; Marubeni Corp., 7.5%)	Three trains at Ras Laffan	10,200
Do.		Qatar Liquefied Gas Co. Ltd. (II) (Qatar Petroleum, 70%; and ExxonMobil Qatargas Inc., 30%)	Train 4 at Ras Laffan	7,500 <sup>1</sup>
Do.		Qatar Liquefied Gas Co. Ltd. (III) (Qatar Petroleum, 65%; ExxonMobil Qatargas Inc., 18.3%; Total S.A., 16.7%)	Train 5 at Ras Laffan	7,500 <sup>1</sup>
Do.		Ras Laffan Liquefied Natural Gas Co. Ltd. (I) (Qatar Petroleum, 63%; ExxonMobil Rasgas, Inc., 25%; Korea Gas Corp., 5%; Itochu Corp., 4%; LNG Japan Corp., 3%)	Two trains at Ras Laffan	6,600
Do.		Ras Laffan Liquefied Natural Gas Co. Ltd. (II) (Qatar Petroleum, 70%, and ExxonMobil Rasgas, Inc., 30%)	Trains 3, 4, and 5 at Ras Laffan	14,300
Do.		Ras Laffan Liquefied Natural Gas Co. Ltd. (III) (Qatar Petroleum, 70%, and ExxonMobil Rasgas, Inc., 30%)	Trains 6 and 7 at Ras Laffan	15,600 <sup>1</sup>
Nitrogen:				
Ammonia		Qatar Fertiliser Co. S.A.Q. (Qafco) (Industries Qatar Q.S.C., 75%; Yara Nederland B.V., 15%; Fertilizer Holdings AS, 10%)	QAFCO 1, Mesaieed	420
Do.		do.		440
Do.		do.	QAFCO 3, Mesaieed	650
Do.		do.	QAFCO 4, Mesaieed	740
Urea		do.	QAFCO 1, Mesaieed	470
Do.		do.	QAFCO 2, Mesaieed	530
Do.		do.	QAFCO 3, Mesaieed	890
Do.		do.	QAFCO 4, Mesaieed	1,300

See footnotes at end of table.

TABLE 2--Continued  
QATAR: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Petroleum:</b>				
Crude	thousand 42-gallon barrels	Maersk Oil Qatar AS, operator <sup>2</sup>	Al Shaheen Field, offshore	107,000
Do.	do.	Qatar Petroleum (Government, 100%)	Dukhan Field, onshore	100,000
Do.	do.	Occidental Petroleum of Qatar Ltd., operator <sup>2</sup>	Idd Al Sharqi, North Dome and South Dome, offshore	40,000
Do.	do.	Qatar Petroleum (Government, 100%)	Bul Hanine Field, offshore	20,000
Do.	do.	Total S.A., operator <sup>2</sup>	Al Khaleej, offshore	15,000
Do.	do.	do.	Maydan Mahzam Field, offshore	13,000
Do.	do.	Bunduq Co., Ltd., operator <sup>2</sup> (BP Exploration, 33.3%; Total S.A., 33.3%; United Petroleum Development Co., 33.3%)	El Bunduq <sup>3</sup>	5,300
Do.	do.	Anadarko Petroleum Corp., 92.5%, operator <sup>2</sup>	Al Rayyan, offshore	5,000
Do.	do.	Qatar Petroleum Development Co., operator <sup>2</sup> (Cosmo Oil Co., Ltd., Nissho Iwai Corp., United Petroleum Development Co.)	Al Karkara and A Structure	2,000
Refined	do.	Oryx GTL Ltd. (Qatar Petroleum, 51%; and Sasol Ltd., 49%)	Ras Laffan	12,400
Do.	do.	Qatar Petroleum (Government, 100%)	Mesaieed	115,000
Sulfur		Ras Laffan Liquefied Natural Gas Co. Ltd.	Ras Laffan	110
Do.		Qatar Petroleum (Government, 100%)	Mesaieed	95
Do.		Qatar Petrochemical Co. Ltd.	Umm Said	70
Do.		Qatar Liquefied Gas Co. Ltd.	Ras Laffan	66

<sup>1</sup>Under construction.

<sup>2</sup>Operated under a development and production-sharing agreement with Qatar Petroleum.

<sup>3</sup>El Bunduq Field is located on the border between Qatar and the United Arab Emirates. Royalties are shared by the Governments.