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The Mineral Industry of Qatar

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In 2016, Qatar's real gross domestic product (GDP) increased by 2.2% compared with an increase of 3.6% in 2015. Qatar was a major producer of aluminum (primary), ammonia, crude petroleum, direct-reduced iron (DRI), helium, natural gas, sulfur, and urea. Qatar was the world's fourth-ranked producer of natural gas, accounting for 5.1% of global output, and the leading exporter of liquefied natural gas (LNG), accounting for 30% of the world's LNG exports. According to BP p.l.c., the country's proven natural gas reserves were estimated to be 24.3 trillion cubic meters, making it the country with the third largest proven natural gas reserves in the world, or 13.0% of the world's total, and the second largest natural gas reserves in the Middle East and North Africa, behind Iran. Qatar was the world's second-ranked producer of helium, accounting for an estimated 31% of global output. Other mineral commodities produced in Qatar included cement, gypsum, lime, methanol, and sand. Qatar was a member of the Cooperation Council for the Arab States of the Gulf, or the Gulf Cooperation Council (GCC), and a member of the Organization of the Petroleum Exporting Countries (OPEC) (table 1; BP p.l.c., 2017, p. 26, 28, 34–35; Qatar Central Bank, 2017, p. 21; Hamak, 2018).

In 2016, the Government continued with implementation of the Qatar National Vision (QNV 2030) with the goal of transforming Qatar into a diversified and knowledge-based economy by 2030. This planning document sets long-term economic transformation goals aimed at reducing reliance on the hydrocarbon sector through large investments in the industrial sector. The country planned to spend $200 billion on the development of tourism and transportation infrastructure. Foreign investment is permitted under investment law No. (13) of 2000, which allows foreign investors to own up to 100% of projects that involve the mining and development of natural resources and development of the mining sector, upon the Government's approval. The primary sectors that attracted foreign direct investment were downstream manufacturing, hydrocarbons, marketing, and transportation (U.S. Department of State, 2017).

Minerals in the National Economy

In 2016, the value of the hydrocarbon sector decreased by 1.0% owing to higher maintenance costs, maturing oilfields, and the lower price of oil; despite the decrease, the sector continued to be the country's primary economic sector, accounting for 49.5% of real GDP. The value of Qatar's total exports decreased by 21% to about $72.5 billion from about $92.0 billion in 2015, of which crude petroleum exports decreased to about $23.0 billion from $28.5 billion. The average price of the country's export blend decreased to $41.43 per barrel in 2016 from $50.71 per barrel in 2015. Lower oil prices and the slight decrease in hydrocarbon production resulted in a 22.1% decrease in Government revenues from hydrocarbons sales. Hydrocarbon revenue as a share of total Government revenue decreased to 82.4% from 93% in 2015. The nonhydrocarbon sector, which accounted for 50.5% of real GDP, increased by 5.6% in 2016 owing to additional Government investment spending (Organization of the Petroleum Exporting Countries, 2017, p. 20, 99; Qatar Central Bank, 2017, p. 13, 21, 47; Qatar National Bank S.A.Q., 2017, p. 7).

Production

In 2016, significant increases in production included that of gasoline and kerosene, which increased by 24% and 13%, respectively, compared with that of 2015. In 2016, significant decreases in production included that of residual fuel oil, which was reported to have decreased by 57% compared with that of 2015. Data on mineral production are in table 1.

Structure of the Mineral Industry

Qatar Petroleum (QP) is a state-owned public corporation that owned and operated exploration, refinery, and production facilities in Qatar. Through its subsidiaries, QP controlled all aspects of Qatar's upstream and downstream crude petroleum and natural gas sector, including the exploration, production, transport, storage, marketing, and sale of crude petroleum, gas-to-liquids (GTL), LNG, and natural gas liquids (NGL), in addition to fertilizers and petrochemicals. Qatargas Co. (Qatargas), which was a subsidiary of Qatargas Operating Co. Ltd. (OPCO), operated four primary LNG enterprises at Ras Laffan. Qatargas produced helium from two plants at Ras Laffan. In December, QP announced plans to merge Qatargas and RasGas Co. Ltd., both subsidiaries of QP, to decrease operation costs. The merger was expected to be completed within 1 year (table 2; S&P Global Platts, 2016).

State-owned company Industries Qatar Q.S.C. (IQ) owned 80% of Qatar Petrochemical Co. Ltd. Q.S.C. (QAPCO); the remaining share (20%) was owned by Total S.A. of France. IQ also owned 50% of Qatar Fuel Additives Co. Ltd. Q.S.C. (QAFAC) [the remainder of QAFAC shares were owned by OPIC Middle East Corp. (20%), and International Octane Ltd. and LCY Middle East Corp. (15% each)], which mainly produced methanol, petrochemicals, and sulfur. IQ also held a 75% majority interest in Qatar Fertilizer Co. S.A.Q. (QAFCO) (the remaining 25% was owned by Yara Netherland BV of the Netherlands), which produced primarily ammonia and urea. Qatar Aluminium Ltd. (QATALUM), which was a 50–50 joint venture between QP and Norsk Hydro ASA (Norsk Hydro) of Norway, produced primary and secondary aluminum from its smelter at Mesaieed. Qatar Steel Co. Q.S.C. (QASCO), which was a wholly owned subsidiary of IQ, produced hot-briquetted iron and DRI, steel-reinforcing bar (rebar), steel billets, and steel coils, in addition to lime. QASCO was the sole iron and steel production company in Qatar (table 2; Industries Qatar Q.S.C., 2017, p. 9–11; Norsk Hydro ASA, 2017, p. 145).

Commodity Review

Metals

Aluminum.—In 2016, QATALUM produced about 612,000 metric tons (t) of aluminum compared with 610,000 t in 2015. The company's complex, which consisted of an aluminum smelter, casthouse, carbon anode plant, and powerplant, had a total production capacity of 640,000 tons per year (t/yr), of which extrusion billets accounted for 340,000 t/yr, and foundry alloys, 300,000 t/yr. The carbon plant had the capacity to produce 320,000 t/yr of anodes. QATALUM reported that its aluminum products were exported to 30 countries. Norsk Hydro supplied all QATALUM's alumina needs for aluminum production and purchased all aluminum production from QATALUM. The company operated under a 10-year income tax exemption that was scheduled to expire in 2020. QATALUM sourced electricity from a dedicated natural gas powerplant that was supplied with natural gas by QP under a 40-year supply contract (the contract was scheduled to expire in 2049) (table 2; Qatar Aluminium Ltd., 2013; Littlegate Publishing Ltd., 2015; Norsk Hydro ASA, 2017, p. 21, 69, 71, 163).

Iron and Steel.—Crude (raw) steel output decreased slightly to 2.5 million metric tons (Mt) in 2016 from 2.6 Mt in 2015. DRI production decreased to 2.5 Mt from a revised 2.6 Mt in 2015. In 2016, 65% of QASCO's total sales volume was sold domestically, 30% was sold to the other GCC countries, and 5% was sold to others (table 1; Qatar Steel Q.S.C., 2017, p. 28).

Mineral Fuels and Related Materials

Helium.—In 2016, Qatar was estimated to have produced about 50 million cubic meters of helium, which remained unchanged from that of 2015. The Qatar Helium 1 and 2 plants, located in Ras Laffan, had a total capacity of 55.4 million cubic meters per year of liquefied helium. The helium plants were owned by the joint venture of RasGas and Exxon Mobil Corp. of the United States. In 2016, RasGas continued with development of the Helium 3 plant project, which was also located in Ras Laffan. The plant was expected to have a production capacity of 11.3 million cubic meters per year of helium and to become operational in early 2018. The sales and purchase agreement for helium produced from the plant and the technology license for plant equipment was awarded to Air Products and Chemicals Inc. of the United States (tables 1, 2; Cockerill, 2017; Exxon Mobil Corp., 2017, p. 78).

Natural Gas.—In 2016, Qatar's natural gas production increased slightly to 182.8 billion cubic meters compared with 181.4 billion cubic meters in 2015. The country's exports of natural gas increased slightly in 2016 to 130.3 billion cubic meters from 129.9 billion cubic meters in 2015. Qatar exported 104.4 billion cubic meters of natural gas by LNG vessel to 19 countries; of this amount, 68 billion cubic meters went to Asia and 23.7 billion cubic meters went to Europe and Eurasia. Qatar exported 20 billion cubic meters of natural gas by pipeline to the United Arab Emirates (17.9 billion cubic meters) and Oman (2.1 billion cubic meters) (table 1; BP p.l.c., 2017, p. 34–35; Organization of the Petroleum Exporting Countries, 2017, p. 126).

In 2016, Qatargas continued with construction of the Barzan gas project. Although the Barzan project was expected to begin production in November 2016, the project startup had been delayed because of a leak in an upstream pipeline in October 2016. The $10 billion project, which was a joint venture between Qatargas (93%) and ExxonMobil (7%), consisted of offshore wellhead platforms and an onshore gas-processing unit, a sulfur recovery unit, and an NGL recovery unit. The Barzan project would process associated natural gas from the North Field natural gas deposit and had an expected capacity of 14.3 billion cubic meters per year of natural gas. The project was also expected to produce 800,000 t/yr of sulfur, 12.4 million barrels per year (Mbbl/yr) of ethane, 10.2 Mbbl/yr of field and plant condensates, 3.8 Mbbl/yr of propane, and 2.7 Mbbl/yr of butane. The project was expected to begin operations in the second half of 2017 (Doherty, 2011; Petroleum Economist, 2015; Economist, The, 2016; Ratcliffe, 2017).

Petroleum.—In 2016, Qatar's production of crude petroleum and condensate increased slightly to about 693.2 million barrels (Mbbl) from 690.0 Mbbl in 2015. In 2016, the country exported about 183 Mbbl of crude petroleum to the Asia and the Pacific region and 730,000 barrels of crude petroleum to Africa. Three fields—Al Shaheen, the Dukhan, and the Idd Al-Shargi fields—accounted for more than 85% of the country's crude petroleum production capacity. In June, QP announced the establishment of the North Oil Co., which was a joint venture of QP (70%) and Total S.A. (30%). The company would further develop and operate the Al-Shaheen oilfield. The Al-Shaheen oilfield currently produced about 40% of the country's crude petroleum, or about 300,000 barrels per day (bbl/d) (tables 1, 2; Mirza, Adal, 2016; Organization of the Petroleum Exporting Countries, 2017, p. 57).

Refined Petroleum Products.—By yearend 2016, Qatargas began commercial production at the 146,000-barrel-per-day (bbl/d)-capacity Laffan Refinery 2, which refined condensate from the North Field. The completion of the refinery—an expansion project of Laffan Refinery 1—doubled the refinery complex's capacity to 292,000 bbl/d of refined products. Qatar's total refining capacity increased to 429,000 bbl/d with the startup of Laffan Refinery 2; the Laffan Refinery 2 produced butane, kerosene jet fuel, low sulfur diesel, naphtha, and propane. The country exported 207 Mbbl of refinery products to the Asia and the Pacific region in 2015 (Pioneer, The, 2017, p. 3; Organization of Petroleum Exporting Countries, 2017, p. 39, 58).

Outlook

Qatar's economic growth is projected to be positive in the short term. According to the Qatar Central Bank, Qatar's economy is projected to grow by 3% to 4% in 2017. Hydrocarbons are likely to continue to be the dominant mineral commodities produced in Qatar, so the country's rate of economic growth will likely be tied to global crude petroleum and natural gas prices. Increased production of natural gas is projected to continue with the expected completion of the offshore Barzan Gas project during the next several years and the North Field project during the longer term. In the nonhydrocarbon sector, construction, manufacturing, retail, and wholesale trade will continue to be developed by the

Government and emerge as new drivers of economic growth (Qatar Central Bank, 2017, p. 128).

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TABLE 1

QATAR: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons, gross weight, unless otherwise specified)

Commodity[2]		2012	2013	2014	2015	2016
METALS						
Aluminum metal, primary		628	634	640	610	612
Iron and steel:						
Direct-reduced iron		2,423	2,385	2,547	2,631 r	2,506
Raw steel		2,443	2,536	3,474	2,593	2,521
Products:						
Bars, rolled		1,967	2,044	2,123	2,162 r	2,272
Billet, cast		2,148	2,236	2,867	2,594 r	2,568
INDUSTRIAL MINERALS						
Cement, hydraulic		5,500	5,335 r	6,500 r, e	6,500 r, e	6,500 e
Gypsum		145	150	200	210	210 e
Helium	million cubic meters	20	40	46	49	50 e
Lime		110	120	150	120	130 e
Nitrogen, fertilizer, N content:						
Ammonia		2,619	2,986	2,972	3,048	2,957
Urea		2,071	2,535	2,499	2,618	2,607
Stone, sand, and gravel:						
Sand and gravel, construction, sand		4,100	4,700	5,900	7,800	7,800 e
Stone, dimension, limestone[e]		2,200	2,200	2,200	2,300	2,300
Stone, size and shape unspecified, calcium carbonate		75	17	28	37	37 e
Sulfur compounds, sulfuric acid		10 e	10 e	10 e	10 e	10
Sulfur, natural gas, byproduct, S content[e]		1,840 r	1,980 r	1,900 r	1,900 r	1,900
MINERAL FUELS AND RELATED MATERIALS						
Liquefied natural gas	million metric tons	77	78	76	79	77
Methanol		983	1,000	982	1,000	1,000
Natural gas, marketable	million cubic meters	157,050	177,602	174,057	181,444 r	182,830
Petroleum:						
Crude, including condensate	thousand 42-gallon barrels	705,000 r	695,800 r	688,500 r	690,000 r	693,200
Refinery production:						
Distillate fuel oil	do.	16,400 r	16,100 r	16,400 r	15,600 r	15,500
Gasoline	do.	16,800 r	13,500 r	16,900 r	13,500 r	16,700
Kerosene, including jet fuel	do.	28,800 r	27,700 r	24,600 r	26,000 r	29,300
Liquefied petroleum gas	do.	118,552	130,500	124,962	128,000 e	128,000 e
Residual fuel oil	do.	2,190 r	2,560 r	1,640 r	3,470 r	1,500
Other	do.	176,000 r	177,000 r	174,000 r	165,000 r	168,000
Total	do.	359,000 r	367,000 r	359,000 r	352,000 r	359,000

[e]Estimated. [r]Revised. do. Ditto.

[1]Table includes data available through March 2, 2018. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]In addition to the commodities listed, clay, dolomite, and shale may have been produced in Qatar, but available information was inadequate to make reliable estimates of output.

TABLE 2
QATAR: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Qatar Aluminium Ltd. (Qatalum) [Qatar Petroleum (QP), 50%, and Norsk Hydro ASA, 50%]	Smelter at Mesaieed	640
Calcium carbonate		Qatar National Cement Co. (QNCC) (Government, 43%, and private Qatari investors, 57%)	Umm Bab, 82 kilometers west of Doha	75
Cement:				
Portland		Qatar National Cement Co. (QNCC) (Government, 43%, and private Qatari investors, 57%)	4 kilns and 4 mills at Umm Bab	4,400
Do.		Al Khalij Cement Co. (Qatari Investors Group 100%)	Kiln at Umm Bab	5,700
Do.		Al Jabor Cement Industries Co. (Al Jabor Holdings, 75%, and Holcim Ltd., 25%)	2 clinker grinding mills at Mesaieed	900
White		Qatari Saudi Company for Industrial Transformation	do.	165
Gypsum		Qatari Saudi Company for Gypsum [Qatar Industrial Manufacturing Co., 33.375%; Qatar National Cement Co. (QNCC), 33.250%; National Gypsum Co., 33.375%]	Salwa Industrial Area	135
Helium	million cubic meters	Joint venture of Qatar Liquefied Gas Co. Ltd. 1 (Qatargas 1), Ras Laffan Liquefied Natural Gas Co. Ltd. (RasGas), and Ras Laffan Liquefied Natural Gas Co. Ltd. (II) (RasGas II)	Qatar Helium plants 1 and 2, Ras Laffan	55.4
Iron and steel:				
Iron, direct reduced		Qatar Steel Co. Q.S.C. (QASCO) [Industries Qatar Q.S.C. (IQ), 100%]	Mesaieed	2,800
Rebar, coating		Qatar Metals Coating Co. W.L.L. (Q-Coat) [Qatar Steel Co. Q.S.C. (QASCO) and Qatar Industrial Manufacturing Co.]	Plant at Mesaieed	100
Steel, crude		Qatar Steel Co. Q.S.C. (QASCO) [Industries Qatar Q.S.C. (IQ), 100%]	do.	3,500
Steel, rolled		do.	Rolling mill at Mesaieed	1,440
Lime		Qatar National Cement Co. (QNCC) (Government, 43%, and private Qatari investors, 57%)	Kilns at Umm Bab	15
Do.		Qatar Steel Co. Q.S.C. (QASCO) [Industries Qatar Q.S.C. (IQ), 100%]	Mesaieed	200
Methanol		Qatar Fuel Additives Co. Ltd. Q.S.C. (QAFAC) (Industries Qatar Q.S.C., 50%; OPIC Middle East Corp., 20%; LYC Middle East Corp., 15%; International Octane Ltd., 15%)	do.	1,000
Natural gas:				
Extracted	billion cubic meters	Qatar Petroleum (QP) (Government, 100%)	Al Khaleej field	8
Do.	do.	do.	North field	20
Do.	do.	do.	North field Alpha	10
Liquefied		Qatargas Operating Co. Ltd. (Qatargas 1) [Qatar Petroleum (QP), 65%; Total S.A., 10%; ExxonMobil Qatar Inc., 10%; Mitsui & Co., Ltd., 7.5%; Marubeni Corp., 7.5%]	Three trains at Ras Laffan	10,000
Do.		Qatargas Operating Co. Ltd. (Qatargas 2) [Qatar Petroleum (QP), 70%, and ExxonMobil Qatar Inc., 30%]	Train 4 at Ras Laffan	7,800
Do.		Qatargas Operating Co. Ltd. (Qatargas 2) [Qatar Petroleum (QP), 65%; ExxonMobil Qatar Inc., 18.3%; Total S.A., 16.7%]	Train 5 at Ras Laffan	7,800
Do.		Qatargas Operating Co. Ltd. (Qatargas 3) [Qatar Petroleum (QP), 68.5%; ConocoPhillips Co., 30%; Mitsui & Co. Ltd., 1.5%]	Train 6 at Ras Laffan	7,800
Do.		Qatargas Operating Co. Ltd. (Qatargas 4) [Qatar Petroleum (QP), 70%, and Royal Dutch Shell plc, 30%]	Train 7 at Ras Laffan	7,800
Do.		Ras Laffan Liquefied Natural Gas Co. Ltd. (RasGas) [Qatar Petroleum (QP), 63%; ExxonMobil Qatar Inc., 25%; Korea Gas Corp., 5%; Itochu Corp., 4%; LNG Japan Corp., 3%)	Trains 1 and 2 at Ras Laffan	6,600
Do.		Ras Laffan Liquefied Natural Gas Co. Ltd. 2 (RasGas 2) [Qatar Petroleum (QP), 70%, and ExxonMobil Qatar Inc., 30%]	Trains 3, 4, and 5 at Ras Laffan	14,100
Do.		Ras Laffan Liquefied Natural Gas Co. Ltd. 3 (RasGas 3) [Qatar Petroleum (QP), 70%, and ExxonMobil Qatar Inc., 30%]	Trains 6 and 7 at Ras Laffan	15,600

See footnotes at end of table.

TABLE 2—Continued
QATAR: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Nitrogen:				
Ammonia		Qatar Fertilizer Co. S.A.Q. (QAFCO) [Industries Qatar Q.S.C. (IQ), 75%, and Yara Netherland BV, 25%]	QAFCO 1, Mesaieed	330
Do.		do.	QAFCO 2, Mesaieed	900
Do.		do.	QAFCO 3, Mesaieed	1,500
Do.		do.	QAFCO 4, Mesaieed	2,000
Do.		do.	QAFCO 5, Mesaieed	2,000
Do.		do.	QAFCO 6, Mesaieed	2,000
Urea		do.	QAFCO 1, Mesaieed	1,000
Do.		do.	QAFCO 2, Mesaieed	1,000
Do.		do.	QAFCO 3, Mesaieed	2,000
Do.		do.	QAFCO 4, Mesaieed	3,200
Do.		do.	QAFCO 5, Mesaieed	3,850
Do.		do.	QAFCO 6, Mesaieed	3,850
Petroleum:				
Crude	42-gallon barrels per day	Maersk Oil Qatar A.S., operator[1]	Al Shaheen field, offshore	300,000
Do.	do.	Qatar Petroleum (QP) (Government, 100%)	Dukhan field, onshore	256,000
Do.	do.	do.	Bul Hanine field, offshore	37,000
Do.	do.	Occidental Petroleum Corp., operator[1]	Idd Al Shargi, North Dome and South Dome, offshore	113,000
Do.	do.	do.	Al Rayyan, offshore	8,600
Do.	do.	United Petroleum Development Co. Ltd. (Bunduq Oil Production Co. Ltd., 97%, and BP p.l.c., 3%)	El Bunduq[2]	7,300
Do.	do.	Total E&P Qatar Ltd., operator[1]	Al Khaleej, offshore	37,500
Do.	do.	do.	Maydan Mahzam field, offshore	36,000
Do.	do.	Qatar Petroleum Development Co. operator[1] (Cosmo Oil Co., Nissho Iwai Corp., and United Petroleum Development Co.)	Al Karkara and A Structure	6,200
Refined	do.	Qatar Petroleum Refinery [Qatar Petroleum (QP), 100%]	Mesaieed	137,000
Do.	do.	The Laffan Refinery Co. Ltd. [Qatar Petroleum (QP), 51%; Cosmo Oil Co., 10%; Exxon Mobil Corp., 10%; Idemitsu Kosan Co. Ltd., 10%; Mitsui and Co., 4.5%; Marubeni Corp. 4.5%]	Ras Laffan I	146,000
Do.	do.	do.	Ras Laffan II	146,000
Sand, washed		Qatar National Cement Co. (QNCC) (Government, 43%, and private Qatari investors, 57%)	Umm Bab	10,000
Do.		Qatar Sand Treatment Plant (Qatar Industrial Manufacturing Co. (Q.S.C.)	do.	1,000
Stone, limestone		Qatar Steel Co. Q.S.C. (QASCO) [Industries Qatar Q.S.C. (IQ), 100%]	do.	75
Sulfur:				
Elemental		Ras Laffan Liquefied Natural Gas Co. Ltd. (RasGas)	do.	400
Do.		Qatar Petroleum (QP) (Government, 100%)	Mesaieed	100
Do.		Qatar Petrochemical Co. Ltd. Q.S.C. (QAPCO)	Umm Said	100
Do.		Qatar Liquefied Gas Co. Ltd. Q.S.C. (Qatargas)	Ras Laffan	300
Sulfuric acid		Qatar Industrial Manufacturing Co. (Q.S.C.)	Mesaieed	11

Do., do. Ditto.
[1]Operated under a development and production-sharing agreement with Qatar Petroleum.
[2]El Bunduq field is located on the border between Qatar and the United Arab Emirates. Royalties are shared by the Governments.