



2016 Minerals Yearbook

UNITED ARAB EMIRATES

THE MINERAL INDUSTRY OF THE UNITED ARAB EMIRATES

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The United Arab Emirates (UAE)¹ was the world's fifth-ranked producer of aluminum in 2016 and accounted for 4.2% of the world's aluminum smelter output. In addition, the UAE was the world's eighth-ranked producer of crude petroleum and condensate, accounting for 4.2% of the world's production. The country's proven crude petroleum reserves, which accounted for 5.7% of the world's total crude petroleum reserves, were estimated to be 97.8 billion barrels. Natural gas reserves, which accounted for about 3.3% of the world's proven natural gas reserves, were estimated to be 6.1 trillion cubic meters. The UAE was a major regional producer of industrial minerals, metals, and downstream metal products, including cement, iron and steel, nitrogen fertilizers, and sulfur. Other mineral commodities produced in the country included gypsum, lime, and refined petroleum products (table 1; BP p.l.c., 2017, p. 12, 16, 26; Apodaca, 2018; Bray, 2018).

In 2016, the gross domestic product (GDP) of the UAE increased by 2.3% in real terms compared with a higher average of 5.0% between 2010 and 2014; the decrease in economic growth was attributed to lower international oil prices and lower government spending. Net annual foreign direct investment inflows reached about \$9.0 billion in 2016, which was an increase of 2.3% from \$8.8 billion in investment inflows in 2015; aluminum and petrochemical industries were the sectors that received the most investment. The UAE was a member of the Organization of the Petroleum Exporting Countries (OPEC) and the Cooperation Council for the Arab States of the Gulf (GCC) (United Arab Emirates Ministry of Economy, 2017, p. 22–23, 39).

Minerals in the National Economy

The value of the mining and energy sector decreased by 26% to \$58 billion² in 2016 from \$78 billion in 2015. Despite the decrease, the mining and energy sector remained the largest contributor to the country's GDP, accounting for 16.7% of the total, although that was down from 21.9% in 2015 and 39.1% in 2012. Other leading sectors in the economy were wholesale and retail trade, which accounted for 12.8% of the GDP; construction and building activities, 10.3%; financial services, 10.1%; and transformative (manufacturing), 9.5% (United Arab Emirates Ministry of Economy, 2017, p. 26–33).

In 2016, Government revenue (estimated) from hydrocarbon activity decreased by 27% to \$37.7 billion from \$51.3 billion

in 2015. The \$13.6 billion decrease in hydrocarbon revenues was partially offset by increases in revenues from other sources, as the Government's total revenues decreased by only \$5.2 billion (about 5%) to \$98.6 billion. In 2016, revenue from hydrocarbons accounted for about 38% of total Government revenue compared with about 49% in 2015 and 68% in 2014 (International Monetary Fund, 2017, p. 29).

In 2016, the value of the UAE's total exports decreased slightly to about \$299 billion from \$300 billion in 2015. The decrease was attributed to a 15% decrease in the value of crude petroleum exports, which were about \$45.6 billion compared with \$53.8 billion in 2015. The average price of the UAE's export of Murban crude petroleum, the country's export blend, decreased to \$44.83 per barrel in 2015 from \$53.87 per barrel in 2015. The value of the country's exports of nonfuel mineral products decreased by 10.4% to about \$1.9 billion in 2016. The export value of base metals and articles of base metals decreased by 2.7% to \$8.4 billion. Major export of metals, in terms of tonnage, included 3.03 million metric tons (Mt) of crude steel, 2.71 Mt of aluminum, 734,000 metric tons (t) of iron, 285,000 t of copper, and 32,800 t of fertilizers (Organization of the Petroleum Exporting Countries, 2017, p. 19–20, 98; United Arab Emirates Federal Competitiveness and Statistics Authority, 2017, tables 15, 17).

The value of the UAE's total imports of goods increased by 2.7% in 2016 to about \$189 billion. Imports of pearls, gemstones, and precious metals and their products, which accounted for about 28% of the country's imports, increased in value by 17.2% to about \$53 billion. The value of mineral products imports increased by 38.6% to \$4.1 billion (United Arab Emirates Federal Competitiveness and Statistics Authority, 2017, table 14).

Although the UAE did not produce mined diamond or gold in 2016, the country was a major global trade center of both rough and polished diamond and gold. In 2016, the UAE's imports of gold increased by about 30% and its exports of gold decreased by about 1% compared with those of 2015. The country imported 971,000 kilograms (kg) of unwrought or semimanufactured gold in 2016, including gold in powder form or plated with platinum, and exported 513,400 kg, of which about 95,600 kg (estimated) was reexports. The country's imports of rough diamond increased by 13% to 69.956 million carats in 2016 from 62.0 million carats in 2015; exports of rough diamond increased by 8% to 68.680 million carats in 2016 from 63.582 million carats in 2015. The UAE's diamond trading partners included diamond-producing countries in Africa; diamond-processing centers in China and India; and diamond-consuming markets in China, Europe, and the United States (Kimberley Process Certification Scheme, 2016, 2017; United Arab Emirates Federal

¹The United Arab Emirates is a federation of seven Emirates: Abu Dhabi, Ajman, Dubai (Dubayy), Fujairah (Al Fujayrah), Ras Al Khaimah, Sharjah (Ash Shariqah), and Umm al-Quwain (Umm Al Qaywayn).

²Where necessary, values have been converted from United Arab Emirates dirham (AED) to U.S. dollars (US\$) at the average rate of AED3.67190=US\$1.00 for 2016 and AED3.67219=US\$1.00 for 2015.

Competitiveness and Statistics Authority, 2016, tables 27–30; 2017, tables 27–30; Dubai Multi Commodities Centre, 2018).

The UAE did not have a specific, comprehensive Federal law covering the mining industry. Article 23 of the UAE Federal Constitution granted each Emirate ownership of, as well as the ability to manage and mine, its mineral resources. The Abu Dhabi Emirate, which is the largest of the UAE's seven Emirates in terms of land area, controlled 94% of the UAE's national petroleum and natural gas reserves; the Dubai Emirate controlled 4% and 1.5% of the national petroleum and gas reserves, respectively; and, combined, the other five Emirates controlled the remaining 2%. Each Emirate regulated the extraction of petroleum and natural gas and set the governing policies for the mining of petroleum and natural gas. In Abu Dhabi, the Supreme Petroleum Council regulated, and set related policies for, petroleum and gas extraction. In the Dubai Emirate and the Sharjah Emirate, the Dubai Supreme Council of Energy and the Sharjah Petroleum Council, respectively, were responsible for regulating and developing the petroleum and natural gas industries (DLA Piper, 2012, p. 85–86; Phakey and Renouf, 2014; Legal Advice, 2017).

Production

In 2016, the total production of refined petroleum products increased by 30% compared with that of 2015. The increase was attributed to a completed expansion of the Ruwais refinery, which was the largest refinery in the country (table 1; U.S. Energy Information Administration, 2017, p. 5).

Structure of the Mineral Industry

The Abu Dhabi Emirate controlled and managed its petroleum and natural gas resources through the wholly state-owned Abu Dhabi National Oil Co. (ADNOC). ADNOC operations were run through subsidiaries that carried out most of the exploration, production, transportation, and marketing operations for crude petroleum, petrochemicals, and other petroleum industries in the UAE. The Abu Dhabi Company for Onshore Oil Operations (ADCO) operated eight major onshore fields (Abu Al Bukhoosh, Arzanah, Asab, Bab, Bu Hasa, Jarn Yaphour, Sahil, and Shah). The Abu Dhabi Marine Operating Co. (ADMA–OPCO) operated three offshore fields (Nasr, Umm Sharif, and Zakum). The Zakum Development Co. (ZADCO), which was a consortium of ADNOC (60%), ExxonMobil Oil Co. of the United States (28%), and Japan Oil Development Co. (JODCO) of Japan (12%), operated three offshore fields (Satah, Umm Al-Dalkh, and Upper Zakum). Table 2 is a list of major mineral industry facilities (U.S. Energy Information Administration, 2015; 2017, p. 2–4).

Abu Dhabi Gas Industries Ltd. (GASCO) operated three plants (Asab, Bu Hasa, and Habshan-Bab) for natural gas processing and NGL extraction as well as the NGL fractionation plant at Ruwais. The company also operated a pipeline distribution network to route natural gas to domestic industrial companies, including Emirates Aluminium Co. Ltd. (EMAL) and the local power stations. Abu Dhabi Oil Refining Co. (TAKREER) operated the Ruwais and the Umm Al Nar refineries, and National Gas Shipping Co. (NGSCO) conducted

petroleum processing. Abu Dhabi Gas Liquefaction Co. Ltd. (ADGAS) operated an LNG plant and carried out natural gas processing on Das Island. ADNOC Linde Industrial Gases Co. (ELIXIER), which operated the Ruwais air separation plant and the Mirfa nitrogen plant, also processed natural gas. The chemical and petrochemical manufacturing companies included Abu Dhabi Polymers Co. Ltd. (BOROUGE) and Ruwais Fertilizer Industries (FERTIL). Support services were provided for exploration and production through the National Drilling Co. (NDC), which conducted onshore and offshore drilling; Abu Dhabi Petroleum Ports Operating Co. (IRSHAD), which undertook marine operations of the Abu Dhabi petroleum ports; and the Mussafah Offshore Supply Base (ESNAAD), which provided facilities, services, and supplies (table 2; U.S. Energy Information Administration, 2015; 2017, p. 2–4).

Emirates Global Aluminium (EGA) was a 50–50 joint venture between Mubadala Development Co. of Abu Dhabi and the Investment Corp. of Dubai, which was wholly owned by the Government of Dubai. The company conducted operations through subsidiaries Dubai Aluminium Co. (DUBAL), which operated a 1.0-million-metric-ton-per-year (Mt/yr) aluminum smelter at Jebel Ali in Dubai, and EMAL, which operated a 1.3-Mt/yr aluminum smelter at Taweelah in Abu Dhabi. Other EGA subsidiaries included Guinea Alumina Corp., which continued development of a bauxite mine in the Republic of Guinea, and Al Taweelah Alumina, which was continuing development of an alumina refinery at Taweelah, adjacent to the smelter. The development of the bauxite mine in the Republic of Guinea and the alumina refinery at Taweelah would vertically integrate the company's supply chain. Emirates Steel Industries P.J.S.C. (ESI), which was a subsidiary of Abu Dhabi-based SENAAT General Holding Corp., was the leading steel producer in the UAE and had a total production capacity of 6 Mt/yr. It conducted operations at the integrated steel plant in the industrial city of Abu Dhabi (table 2; SENAAT General Holding Corp., 2016a, 2016b; Emirates Global Aluminium, 2018a).

Commodity Review

Metals

Aluminum.—In 2016, EGA produced 2.5 Mt of aluminum, which was a 5-year high and an increase of 1.5% above the amount produced in 2015. By yearend 2016, EGA employed 6,826 people in the UAE. EGA imported all of its alumina inputs. During the year, EGA continued to develop the Al Taweelah alumina project [a 2-Mt/yr alumina refinery in the Khalifa Industrial Zone (KIZAD) in Abu Dhabi] adjacent to the EGA's 1.32-Mt/yr aluminum smelter. The alumina refinery was expected to be built by 2018 and would have the capacity to produce 4 Mt/yr of alumina from imported bauxite (tables 1, 2; Emirates Global Aluminium, 2015; 2018a; 2018b, p. 15, 71).

Taweelah Aluminium Extrusion Company LLC (TALEX), which was a new joint venture between Gulf Extrusions Co. LLC of Dubai (50%) and SENAAT (50%), completed construction and started up operations in the Khalifa Industrial Zone in Abu Dhabi (KIZAD) to produce aluminum products [50,000 metric tons per year (t/yr) of aluminum profiles and 45,000 t/yr of aluminum billets] for regional and international

markets. The new company was the result of a US\$240 million investment (Lightmetallage.com, 2016; SENAAT General Holding Corp., 2016b).

Ducab Aluminium Co., which was a joint venture between Dubai Cable Co. Ltd. of Dubai (60%) and SENAAT (40%), continued with the construction of a \$60 million aluminum mill. The mill, located in KIZAD, was expected to have a production capacity of 50,000 t/yr of aluminum rods. The new mill was expected to begin operations in 2017 (SENAAT General Holding Corp., 2016a; Utilities-me.com, 2017).

Iron and Steel.—In 2016, raw steel production increased by 4.8% to a 5-year high of 3.1 Mt; high domestic demand for steel continued to be driven by the construction sector and the continued development of infrastructure projects. ESI was the leading steel producer in the UAE with a raw steel capacity of 3.5 Mt/yr. ESI continued the planning and development for the third phase of an expansion project at Mussafah in KIZAD. The third phase of the project was expected to include a new direct-reduced iron plant with a capacity of 2.5 Mt/yr, a melt shop with a capacity of 2.3 Mt/yr, and a continuous rolling mill with a capacity of 2.1 Mt/yr. The project was expected to be commissioned in 2017 (Organisation for Economic Co-operation and Development, 2015, p. 31; Emirates Steel, 2018).

In 2016, Conares Metal Supply Ltd. (a privately held company) began a construction project to expand the capacity of its steel manufacturing facility in Dubai. The company planned to invest about \$25 million to expand the pipe, tube, and rebar factory's capacity to more than 1 Mt/yr from 750,000 t/yr. About 85% of the steel produced by the company was consumed domestically. The company sought to export steel to Australia and Europe (Fahy, 2015; D'Mello, 2016).

Industrial Minerals

Cement.—Arkan Building Materials Co. PJSC (Arkan) announced in late 2016 that it would temporarily close its Emirates cement plant at Al-Ain owing to increasing gas and electricity costs. The plant, which had a capacity of 1.2 Mt/yr, was one of the oldest cement plants in the UAE (had been in operation since the 1970s). Arkan was 51% owned by SENAAT, and the remaining 49% of the shares were held publicly and traded on the Abu Dhabi Securities Market. Arkan noted that decreased production resulting from the plant closure would be offset by increased production at its Al-Ain cement plant, which had been inaugurated in 2014 at a capacity of 4.5 Mt/yr. The company reported that the decision to temporarily close the older plant was expected to save Arkan about \$12 million per year. In 2016, Arkan was among the leading cement producers in the UAE, with total cement production estimated to be 21 Mt (tables 1, 2; Fordham, 2014; Global Cement, 2017).

Mineral Fuels

Natural Gas.—Although natural gas production increased by 1.5% to about 61.1 billion cubic meters in 2016, the UAE continued to be a net natural gas importer. The country's imports of natural gas increased by 1.4% in 2016 to 27.5 billion cubic meters from 27.1 billion cubic meters in 2015. Exports of natural gas in 2016 were 13.2 billion cubic meters, which was

unchanged from the amount exported in 2015; the majority of the country's natural gas exports were exported as LNG to Japan. The country reinjected approximately 26% of gross natural gas production as part of its enhanced oil recovery program. The UAE's domestic primary energy consumption increased by 4.5% to 113.8 Mt of oil equivalent in 2016 compared with 108.6 Mt of oil equivalent in 2015; natural gas accounted for 61% of the UAE's primary energy consumption, and crude petroleum and coal accounted for 38% and 1%, respectively (table 1; BP p.l.c., 2017, p. 9, 34; Organization of the Petroleum Exporting Countries, 2017, p. 126, 128; U.S. Energy Information Administration, 2017, p. 5).

In 2016, ADNOC announced plans to expand by 50% its \$10 billion Al Hosn sour gas facility. The facility, in which ADNOC held a 60% share and Occidental Petroleum of the United States held a 40% share, began operating in 2015 and was located southwest of Abu Dhabi City. The Al Hosn facility was expected to become operational within the next 5 years, although no specific cost estimate or timetable was announced. Officials at ADNOC and Occidental Petroleum noted that the expansion was needed to meet the UAE's rising demand for natural gas (Oil and Gas Journal, 2016a).

Petroleum.—The consolidation of ADMA-OPCO and ZADCO, ADNOC's two main offshore crude petroleum operating companies, was announced in October 2016 with completion anticipated by 2018. ADNOC highlighted the expected financial benefits that would be gained from the merger, including improved efficiency, streamlined operations, and integrated advanced technologies. In addition, company management reported that the merger would allow the company to be well positioned to take advantage of strategic opportunities for future growth. ADNOC's international partners (BP, ExxonMobil, JODCO, and Total), which held the existing concession rights, were not expected to be significantly affected by the consolidation; however, those concessions were under review as they were due to expire in 2018. ADMA-OPCO had a total operating capacity of about 650,000 barrels per day (bbl/d) of crude petroleum from the Lower Zakum, Nasr, Umm Lulu, and Umm Shaif offshore fields. ZADCO had a total operating capacity of about 750,000 bbl/d of crude petroleum from the Satah, Umm Al-Dalkh, and Upper Zakum offshore fields (Abu Dhabi National Oil Co., 2016; Oil and Gas Journal, 2016b).

Outlook

The UAE's economy is expected to grow at rates of 1.3% and 3.4% in 2017 and 2018, respectively, according to the International Monetary Fund. The country's capacity to produce aluminum, cement, and iron and steel is expected to increase during the next few years owing to increased demand resulting from increased Government investment in construction and infrastructure projects in member countries of the GCC. Several infrastructure projects were underway in anticipation of Expo 2020, an international exhibition to be hosted by Dubai, which is expected to highlight the UAE's future potential in both the growing energy and nonenergy sectors of its economy. Nevertheless, the country faces the ongoing challenges related to uncertain global crude petroleum markets and the effect on crude petroleum prices. If prices remain at reduced levels,

Government revenues would be reduced, thus increasing the fiscal deficit and challenging the ability of the Government to invest in needed infrastructure development. Improvements in infrastructure would help to increase output by domestic mineral producers (International Monetary Fund, 2017, p. 27; United Arab Emirates Ministry of Economy, 2017, p. 23, 39).

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TABLE 1
UNITED ARAB EMIRATES: PRODUCTION OF MINERAL COMMODITIES¹

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

Commodity ²	2012	2013	2014	2015	2016
METALS					
Aluminum metal, primary	1,820	1,864	2,341	2,464 ^r	2,500
Iron and steel:					
Direct-reduced iron	2,720	3,075	2,410	3,190	3,480
Raw steel	2,408	2,878	2,390	3,006	3,149
Products:					
Concrete-reinforcing bars	1,586	1,662	1,833	1,988	2,068
Hot-rolled, long	2,156	2,549	2,765	2,959	3,126
INDUSTRIAL MINERALS					
Cement, hydraulic ^e	15,400 ^r	15,700 ^r	16,000 ^r	20,000 ^r	21,000
Gypsum ^e	680	700	700	700	700
Lime ^e	400	450	430	460	470
Nitrogen, N content:					
Ammonia	330	658	995	995 ^e	995 ^e
Urea	289	618	1,015	1,095	1,000 ^e
Sulfur, S content ^e	2,200 ^r	2,510 ^r	3,300	3,300 ^r	3,300
MINERAL FUELS AND RELATED MATERIALS					
Natural gas, marketable	54,300	54,600	54,245	60,181	61,084
Natural gas liquids	281,000 ^r	297,000 ^r	257,000 ^r	302,000 ^r	312,000
Petroleum:					
Crude, including condensate	do.	1,241,000 ^r	1,324,000 ^r	1,341,000 ^r	1,434,000 ^r
Refinery:					
Distillate fuel oil	do.	40,880 ^r	44,968 ^r	44,968 ^r	64,569 ^r
Gasoline	do.	31,974 ^r	33,361 ^r	31,828 ^r	37,413 ^r
Kerosene, including jet fuel	do.	65,883 ^r	69,898 ^r	65,883 ^r	93,769 ^r
Residual fuel oil	do.	12,885 ^r	18,615 ^r	9,490 ^r	9,527 ^r
Other	do.	76,139 ^r	71,650 ^r	76,139 ^r	99,463 ^r
Total	do.	228,000 ^r	238,000 ^r	228,000 ^r	305,000 ^r
					397,000

^eEstimated. ^rRevised. do. Ditto.

¹Table includes data available through March 15, 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.

²In addition to the commodities listed, common clay, copper, crushed stone, diabase, gravel, limestone, marble, sand, salt, and shale may have been produced in the United Arab Emirates, but available information was inadequate to make reliable estimates of output.

TABLE 2
UNITED ARAB EMIRATES: 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	Emirates Global Aluminium (EGA) [Mubadala Development Co. of Abu Dhabi, 50%, and Investment Corp. of Dubai (Government of Dubai, 100%), 50%]	Smelter at Jebel Ali in Dubai	1,000
Do.	do.	Smelter at Taweelah, Khalifa Industrial Zone (KIZAD), Abu Dhabi	1,320
Cement:			
Portland	Aditya Birla Star Cement (Aditya Birla, 80%, and private, 20%)	Grinding plant at Abu Dhabi	1,200
Do.	do.	Grinding plant at Ajman	900
Do.	do.	Ras Al Khaimah	2,400
Do.	Arabian Gulf Cement Company LLC	Ajman	1,100
Do.	Arkan Building Materials Co. (ARKAN) P.J.S.C. (SENAAT General Holding Corp., 51%)	Emirates cement plant at Al-Ain ¹	1,200
Do.	do.	Al-Ain cement plant	4,500
Do.	Binani Cement Factory LLC	Grinding plant at Jabal Ali	2,000
Do.	Bin Hamel Nael Cement Co.	Grinding plant at Al-Ain	500
Do.	Cemex Falcon LLC	Grinding plant at Dubai	1,600
Do.	Emirates Cement Factory (SENAAT General Holding Corp.)	Abu Dhabi	2,300
Do.	Fujairah Cement Industries P.S.C.	Dibba, Fujairah	2,300
Do.	Gulf Cement Co. (National Investment Co., 35.75%; Ras Al Khaimah government, 7.67%; individual investors, 56.58%)	Khor Khuwair, Ras Al Khaimah	2,700
Do.	Hamriyah Cement Co. FZC (Bin Kamil Investment Group)	Grinding plant at Sharjah	1,000
Do.	Jebel Ali Cement Co. (Sharaf Industries, 100%)	Jebel Ali, Dubai	840
Do.	KCC Co. LLC	Grinding plant at Sharjah	500
Do.	Lafarge Emirates Cement L.L.C. (LafargeHolcim S.A., 50%, and private, 50%)	Fujairah	3,200
Do.	Nael Cement Co.	Grinding plant Al-Ain	700
Do.	National Cement Company P.S.C. (LafargeHolcim S.A.)	Dubai	1,500
Do.	National Cement Co. [LafargeHolcim S.A., 44%, and Emirates International Investment Co. (EIIC), 56%]	Grinding plant in Abu Dhabi	2,000
Do.	Pioneer Cement Industries LLC (Raysut)	Ras Al Khaimah	1,700
Do.	Ras Al Khaimah Cement Co. P.S.C.	Khor Khuwair, Ras Al Khaimah	1,000
Do.	Sharjah Cement and Industrial Development Co. (private, 70%, and government of Sharjah, 30%)	Sharjah	2,000
Do.	Teba Cement Co.	Grinding plant at Abu Dhabi	1,200
Do.	Umm al-Qaywayn Cement Industries Co. P.S.C.	Umm al-Quwain	1,600
Do.	Union Cement Co. P.S.C. (Ras Al Khaimah government, 41%, and Abu Dhabi Investment Authority, 20%)	Khor Khuwair, Ras Al Khaimah	4,800
White	Ras Al Khaimah Company for White Cement and Construction Materials	Ras Al Khaimah	610
Copper, metal	Fujairah Gold FZC (Vedanta Ltd., 100%)	Copper rod plant in Fujairah Free Zone	99
Gold, refined	metric tons Al Etihad Gold L.L.C.	Al Quoz, Dubai	200
Do.	do. Al Etihad Gold Refinery DMCC	Dubai	200
Do.	do. Al Ghaith Gold (private, 100%)	do.	100
Do.	do. Al Ghurair Giga Gold (private, 100%)	do.	100
Do.	do. ARY Aurum Plus (private, 100%)	Sharjah	25
Do.	do. Emirates Gold (private, 100%)	Dubai	200
Do.	do. Fujairah Gold FZC (Vedanta Ltd., 100%)	Fujairah Free Zone 2	20
Do.	do. Kaloti Precious Metals	Sharjah	450

See footnotes at end of table.

TABLE 2—Continued
UNITED ARAB EMIRATES: 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
Iron and steel:				
Iron, direct-reduced	Emirates Steel Industries P.J.S.C. (ESI) (SENAAT General Holding Corp., 100%)		Abu Dhabi	3,500
Do.	Al Nasser Industrial Enterprises LLC		do.	250
Steel:				
Billet	Emirates Steel Industries P.J.S.C. (ESI) (SENAAT General Holding Corp., 100%)		do.	3,500
Do.	Al Nasser Industrial Enterprises LLC		do.	220
Rebar	Alam Steel		Dubai	500
Do.	Al Nasser Industrial Enterprises LLC		Abu Dhabi	90
Do.	Emirates Steel Industries P.J.S.C. (ESI) (SENAAT General Holding Corp., 100%)		do.	1,900
Do.	Essar Steel Middle East PZE		Dubai	1,000
Do.	Hamriyah Steel FZC (Metalloinvest, 80%, and Sheikh Sultan Bin Khalifa Al Nahyan, 20%)		do.	1,000
Do.	Conares Metal Supply Ltd.		do.	750
Do.	Union Iron & Steel Company LLC		Abu Dhabi	500
Do.	Star Steel International LLC		Jebel Ali and Hamriyah Free Zone	360
Do.	Al Ghurair Iron and Steel Co.		Abu Dhabi	350
Wire rod	Emirates Steel Industries P.J.S.C. (ESI) (SENAAT General Holding Corp., 100%)		do.	600
Lime	Emirates Lime factory (Al Jazeera Industrial Group)		do.	350
Do.	Ras Al Khaimah Lime Co. (Ras Al Khaimah Co. for White Cement and Construction Materials PSC)		Ras Al Khaimah	365
Natural gas:				
Liquids (NGL)	Abu Dhabi Gas Industries Ltd. (GASCO) (Abu Dhabi National Oil Co. (ADNOC), 68%; Royal Dutch Shell Group, 15%; Total S.A., 15%; Partex Oil and Gas Group, 2%)		Plants at Asab, Bu Hasa, and Habshan-Bab	10,220
Do.	Abu Dhabi Gas Development Co. Ltd. (Al Hosn Gas [Abu Dhabi National Oil Co. (ADNOC), 60%, and Occidental Petroleum Corp., 40%])		Shah plant	1,606
Liquefied (LNG)	Abu Dhabi Gas Liquefaction Co. Ltd. (ADGAS) [Abu Dhabi National Oil Co. (ADNOC), 70%; BP p.l.c., 10%; Mitsu Co. Ltd., 15%; Total S.A., 5%]		Das Island	8,000
Nitrogen:				
Ammonia	Ruwais Fertilizer Industries (FERTIL) (Abu Dhabi National Oil Co. (ADNOC), 66.66%, and Total S.A., 33.33%)		Ruwais, Abu Dhabi	1,200
Urea	do.		do.	2,100
Petroleum:				
Crude	thousand 42-gallon barrels per day	Abu Dhabi Company for Onshore Oil Operations (ADCO) [Abu Dhabi National Oil Co. (ADNOC), 60%; BP p.l.c., 9.5%; Exxon Mobil Corp., 9.5%; Royal Dutch Shell Group, 9.5%; Total S.A., 9.5%; Participations and Explorations Corp., 2%]	Onshore Abu Dhabi oilfields, including the Abu Al Bukhoosh, the Arzanah, the Asab, the Bab, the Bu Hasa, the Jarn Yaphour, the Sahil, and the Shah fields	1,500
Do.	do.	Abu Dhabi Marine Operating Co. (ADMA-OPCO) [Abu Dhabi National Oil Co. (ADNOC), 60%; BP p.l.c., 14.67%; Total S.A., 13.33%; Japan Oil Development Co. (JODCO), 12%]	Offshore Abu Dhabi oilfields, including the Nasr, the Umm Sharif, and the Zakum fields	650
Do.	do.	Zakum Development Co. (ZADCO) [Abu Dhabi National Oil Co. (ADNOC), 60%; ExxonMobil Abu Dhabi Offshore Petroleum Company Ltd., 28%; Japan Oil Development Co. (JODCO), 12%]	Offshore Abu Dhabi oilfields, including the Satah, the Umm Al-Dalkh, and the Upper Zakum fields	750
Do.	do.	Dubai Petroleum Establishment (Government of Dubai, 100%)	Dubai oilfields, including the Margham, the Falah, the Fateh, the Rashid, and the S.W. Fateh fields	100

See footnotes at end of table.

TABLE 2—Continued
UNITED ARAB EMIRATES: 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
Petroleum:—Continued				
Crude—Continued	thousand 42-gallon barrels per day	BP p.l.c. and Crescent Petroleum Company Inc.	Sharjah oilfields, including the Kahaif, the Saja, the Moveyid, and the Mubarek fields	50
Refinery products	do.	Abu Dhabi Oil Refining Co. (TAKREER) [Abu Dhabi National Oil Co. (ADNOC), 100%]	Ruwais refinery, Ruwais, Abu Dhabi	817
Do.	do.	do.	Umm Al Nar refinery, Abu Dhabi	85
Do.	do.	ENOC Processing Company LCC (EPCL) [Investment Corp. of Dubai (Government of Dubai, 100%), 100%]	Jebel Ali refinery, Jebel Ali, Dubai	140
Do.	do.	Metro Oil Corp.	Fujairah	82
Salt		Alghaith Industries (Al Ghaith Holding PJSC)	Mussafah, Abu Dhabi	110
Sand		Fujairah Natural Resources Corp. (FNRC)	Fujairah	20,000
Silica, glass		Emirates Float Glass LLC (Dubai Investment PJSC, 100%)	Industrial City 1 and 2, Abu Dhabi	440
Do.		Guardian Zoujaj International Float Glass Co. LLC (Guardian RAK)	Ras Al Khaimah	255
Silver, refined	metric tons	Emirates Gold (private, 100%)	Dubai	100
Do.	do.	Fujairah Gold FZC (Vedanta Ltd., 100%)	Fujairah Free Zone 2	105
Do.	do.	Kaloti Precious Metals	Sharjah	450
Sulfur		Abu Dhabi Gas Development Company Ltd. (Al Hosn Gas) [Abu Dhabi National Oil Co. (ADNOC), 60%, and Occidental Petroleum Corp., 40%]	Shah plant	3,175
Do.		Abu Dhabi National Oil Co. (ADNOC)	Abu Dhabi	2,000
Do.		Abu Dhabi Gas Industries Ltd. (GASCO) (Abu Dhabi National Oil Co. (ADNOC), 68%; Royal Dutch Shell Group, 15%; Total S.A., 15%; Partex Oil and Gas Group, 2%)	Plants at Asab, Bu Hasa, and Habshan-Bab	2,370

Do., do. Ditto.

¹Temporarily closed at the end of 2016.