



2019 Minerals Yearbook

SAUDI ARABIA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF SAUDI ARABIA

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Saudi Arabia produced alumina, aluminum, ammonia, copper, crude petroleum, gold, iron and steel, phosphate fertilizers, refined petroleum products, silver, sulfur, titanium sponge, urea, and zinc in 2019. The country was the world's 5th-ranked producer of sulfur and direct-reduced iron (DRI), accounting for 8.1% and 5.4% of the world's production, respectively; the 8th-ranked producer of nitrogen (fixed)-ammonia, accounting for 2.8% of the world production; the 10th-ranked producer of bauxite, accounting for 1.1% of world production; and the 11th-ranked producer of pumice (pozzolan), accounting for 2.8% of the world's production. Saudi Arabia also produced basalt, cement, dolomite, feldspar, granite, iron and steel, gypsum, kaolin, industrial sand, limestone, magnesite, marble, petroleum coke, phosphate rock, pyrophyllite, salt, sand and gravel, schist, and secondary lead (table 1; Midrex Technologies Inc., 2020, p. 2; Apodaca, 2021a, b; Bray, 2021; Crangle, 2021; Jasinski, 2021).

Saudi Arabia was also the world's third-ranked producer of crude petroleum after the United States and Russia in 2019 and held the world's second-largest proven crude petroleum reserves after Venezuela. The country's proven crude petroleum reserves were estimated to be 297.6 billion barrels (Gbbbl), which was 17.2% of the world's total. In 2019, Saudi Arabia was also the world's eighth-ranked country in terms of the volume of its proven natural gas reserves and held 6.0 trillion cubic meters, or about 3% of the world's total proven natural gas reserves. In 2019, Saudi Arabia was the world's ninth-ranked producer of natural gas, accounting for 2.8% of the world's total production (BP p.l.c., 2020, p. 14, 18, 32, 34).

Minerals in the National Economy

Saudi Arabia's economy was the leading economy in the Middle East and North Africa region and the world's 17th-ranked economy in terms of its nominal gross domestic product (GDP), which was 2,974 billion Saudi riyals (\$793.6 billion)¹ in 2019. The country's GDP increased in real terms by 0.3% in 2019 compared with an increase of 2.4% in 2018. The petroleum sector decreased in real terms by 3.7% in 2019 compared with an increase of 3.1% in 2018. The mining and quarrying sector's contribution to the GDP was 28.0% in 2019 compared with 30.1% in 2018. Industrial sector activity, which included the production of aluminum, fertilizer, and steel as well as natural gas processing and petroleum refining, contributed 12.6% to the GDP in 2019 compared with 12.9% in 2018; and the building and construction sector activity accounted for 5.5% of the GDP compared with 5.2% in 2018 (Saudi Arabian Monetary Authority, 2020, p. 26–28, 137).

¹Where necessary, values have been converted from Saudi riyals (SAR) to U.S. dollars (US\$) at the annual average exchange rate of SAR3.75=US\$1.00 for 2019.

Government Policies and Programs

In 2019, the legal framework that regulated the mining and quarrying industry in Saudi Arabia was Royal Decree No. 47 M (the mining investment code) of October 4, 2004. The Deputy Ministry of Mineral Resources (DMR) within the Ministry of Industry, and Mineral Resources (MIMR) supervises the country's mining activities, promotes investments, provides services, and issues mining licenses and concessions in the country. In 2019, the DMR issued licenses for mineral exploration, material collection, reconnaissance, and for four types of mining—building materials quarrying, mining, raw materials quarrying, and small-scale mining. The mining investment code allows for the granting of mining rights to other corporations and individuals and for transferring the rights to other persons with technical and financial competence and expertise. The new mining law, which was posted by the DMR for public comments, had not been adopted and published by the Government in 2019, but it was expected to be approved in June 2020 and to become effective in December 2020. The Government also played a significant role in supporting private investment in the mining sector through its Public Investment Fund and the Saudi Industrial Development Fund. The total number of active licenses registered with the DMR in 2019 was 2,095; these included 1,399 licenses for building materials (sand and gravel, and stone); 536 licenses for mineral exploration; 92 licenses for raw mining materials (gold, copper, iron ore, phosphate rock, and zinc), and 68 licenses for small-scale mining (barite, clay, feldspar, gypsum, limestone, perlite, and salt). In 2019, the mining sector employed 250,000 people in Saudi Arabia (Saudi Arabian Monetary Authority, 2020, p. 29, 53; Thomson Reuters, 2020).

Production

Notable increases in Saudi Arabia's mineral output in 2019 compared with output in 2018 included ferromanganese, which increased, by 70%; flat-rolled aluminum products, by 30%; zinc, by 25%; and silicomanganese, by 21%. Notable decreases in mineral output in 2019 compared with output in 2018 included that of petroleum coke, which decreased by 68%; nonmetallurgical (low-grade) bauxite, by 32%; naphtha, by 15%; liquefied petroleum gas, by 12%; kerosene, by 11%; and schist, by 10%. Data on mineral production are in table 1.

Structure of the Mineral Industry

In 2019, the Government held a majority interest in Saudi Aramco and several companies that operated in the mineral fuels sector. Major mining and mineral processing companies that operated in Saudi Arabia included Al Masane Al Kobra Mining Co. (AMAK), Al-Ittefaq Group, Saudi Arabian Mining Co. (Ma'aden), and SABIC, which in turn owned Saudi Arabian Fertilizer Co. (Safco) and Saudi Iron and Steel Co. (Hadeed).

The country had 19 publicly traded cement companies. Ma'aden, which was a joint stock company, was owned by the Public Investment Fund (67.78%), and the remaining free float shares (32.22%) were owned by private investors. The company, through its subsidiaries and joint ventures, produced alumina, aluminum, bauxite, copper, gold, kaolin, metallurgical and nonmetallurgical (low-grade) bauxite, magnesite, phosphate fertilizers, phosphate rock, silver, and zinc (table 2).

Ma'aden's subsidiaries included six wholly owned companies and six joint ventures. Industrial Minerals Co. (IMC), Ma'aden Fertilizer Co. (MFC), Ma'aden Infrastructure Co. (MIC), Ma'aden Gold and Base Metals Co. (MGBM), Ma'aden Marketing and Distribution Co. (MMDC), and Ma'aden Rolling Co. (MRC) were wholly owned companies. The joint ventures were (1) Ma'aden Aluminum Co. (MAC), which was a joint venture of Ma'aden (74.9%), and Alcoa Inc. of the United States (25.1%); (2) Ma'aden Bauxite and Alumina Co. (MBAC), which was a joint venture of Ma'aden (74.9%) and AWA Saudi Ltd. (25.1%); AWA was owned by Alcoa Corp. of the United States (60%) and Alumina Ltd. of Australia (40%); (3) Ma'aden Phosphate Co. (MPC) which was a joint venture of Ma'aden (70%) and SABIC (30%); (4) Ma'aden Wa'ad Al-Shamal Phosphate Co. (MWSPC), which was a joint venture of Ma'aden (60%), Mosaic Co. of the United States (25%), and SABIC (15%); and (5) Ma'aden Barrick Copper Co. (MBCC), which was a 50–50 joint venture of Ma'aden and Barrick Gold Corp. of Canada; and Sahara & Ma'aden Petrochemicals Co (SAMAPCO), which was a 50–50 joint venture of Ma'aden and Sahara Petrochemical Co. (table 2; SABIC, 2020; Saudi Arabian Mining Co., 2020, p. 146–148).

Mineral Trade

Saudi Arabia's total exports (including reexports) decreased by 11% to \$261.5 billion in 2019 from \$294.4 billion in 2018. The decrease was attributed to the decrease in crude petroleum prices on world markets, which averaged, for Saudi Arabia, \$64.96 per barrel in 2019 compared with \$70.59 per barrel in 2018. Saudi Arabia's crude petroleum exports, which accounted for 63.9% of total exports, decreased to \$167.1 billion in 2019 from \$187.9 billion in 2018 and refined petroleum products exports, which accounted for 13.5% of total exports, decreased to \$35.3 billion from \$43.7 billion in 2018. Petroleum exports, which included crude petroleum and refined products, decreased to 77.4% of the country's total exports in 2019 from 78.7% in 2018 (Saudi Arabian Monetary Authority, 2020, p. 114).

In terms of volume, Saudi Arabia's crude petroleum exports averaged 7.0 million barrels per day (Mbbbl/d) in 2019 from an average of about 7.4 Mbbbl/d exported in 2018. Most of Saudi crude petroleum exports went to Asia (73.5%), followed by Europe (11.3%), North America (8.0%), the Middle East (3.8%), Africa (2.5%), and Latin America (0.9%). Refined petroleum products exports decreased to 1.3 Mbbbl/d in 2019 from 2.0 Mbbbl/d in 2018. Forty-six percent of Saudi Arabia's refined petroleum products were shipped to the Asia and the Pacific region, followed by the Middle East (18%), Africa (15%), and Europe (14%). In 2019, Ma'aden's mineral commodity exports included about 5.1 million metric tons (Mt) of ammonium phosphate [diammonium phosphate (DAP)

and monoammonium phosphate (MAP)], 1.3 Mt of ammonia, 454,000 metric tons (t) of aluminum, 362,000 t of alumina, 251,000 t of flat-rolled aluminum products, 217,334 t of copper concentrate, 42,000 t of unspecified industrial minerals, and 12,253 kilograms (kg) of gold (Organization of the Petroleum Exporting Countries, 2020, p. 47, 49; Saudi Arabian Mining Co. 2020, p. 184–185; Saudi Arabian Monetary Authority, 2020, p. 52; Saudi Arabian Oil Co., 2020, p. 80).

Saudi Arabia's exports of semifinished and finished steel products increased to 2.5 Mt in 2019 from 1.8 Mt in 2018. Imports of semifinished and finished steel products increased by 114% to 7.9 Mt in 2019 from 3.7 Mt in 2018. The increase in steel products exports and imports in recent years was attributed to the increase in steel production capacity and increased domestic demand for steel products in the construction sector, respectively. Saudi Arabia's imports of DRI decreased to 1.2 Mt in 2019 from 1.7 Mt in 2018, and iron ore imports decreased to 5.9 Mt in 2018 from 6.7 Mt in 2017 (World Steel Association, 2020b, p. 10, 13).

The value of Saudi Arabia's imports increased by 5% to \$144 billion in 2019 from \$137 billion in 2018. In 2019, the value of jewelry and wood imports, which included gold and silver, decreased to \$4.8 billion in 2019 from \$5.3 billion in 2018. Saudi Arabia imported \$12.8 billion worth of metals and their products compared with \$11.7 billion imported in 2018, which was a 7.3% increase. Saudi Arabia was the world's 10th-ranked importer of steel in 2019; its steel imports exceeded its exports by 7.5 Mt (Saudi Arabian Monetary Authority, 2020, p. 117; World Steel Association, 2020a p. 55; 2020b, p. 13).

The value of Saudi Arabia's total exports to the United States decreased by 44% to \$13.4 billion in 2019 from \$24.1 billion in 2018. The decrease was mainly attributed to the decrease in the value of crude petroleum exports, which were valued at \$11.2 billion in 2019 compared with \$21.4 billion in 2018. Other mineral-related exports from Saudi Arabia to the United States included fuel oil (valued at \$460 million), petroleum products (\$454 million), bauxite and aluminum (\$295 million), fertilizers (\$230 million), organic chemicals (\$134 million), and precious metals other than gold (\$30 million). Saudi Arabia's imports from the United States increased to \$14.5 billion in 2019 from about \$13.6 billion in 2018. The main minerals and mineral-related imports categories were drilling and oilfield equipment (valued at \$214 million), finished metals shapes (\$173 million), excavation machinery (\$104 million), petroleum products other than fuel oil and steelmaking materials (\$94 million each), iron and steel products (\$93 million), aluminum and alumina (\$8 million), fertilizers and nonferrous metals (\$7 million each), precious metals (\$3 million), and copper (\$2 million) (U.S. Census Bureau, 2020a, b).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—MBAC, which was the sole producer of bauxite and alumina in Saudi Arabia, increased its bauxite production at the Al Ba'itha Mine to more than 4.0 Mt in 2019 from about 3.9 Mt in 2018. The mine was located in the Qassim Region about 600 kilometers (km)

northwest of Ras Al Khair on the gulf coast, where the alumina refinery and the aluminum smelter were located. At the end of 2019, the Al Ba'itha Mine's proven and probable reserves of metallurgical bauxite at a cutoff rate of 40% total available alumina (TAA) were 187.8 Mt grading 48.2% TAA and 9.2% silica dioxide (SiO₂) (table 1; Saudi Arabian Mining Co., 2020, p. 98–99).

MBAC's alumina production at the Ras Al Khair alumina refinery increased to about 1.84 Mt in 2019 from 1.77 Mt in 2018. The refinery supplied alumina for the MAC aluminum smelter and MRC rolling mill. MBAC exported alumina to neighboring countries of the gulf region. MBAC increased its exports of alumina to 362,000 t in 2019 from 311,000 t in 2018 (table 2; Saudi Arabian Mining Co., 2020, p. 184–185, 227).

Saudi Arabia's aluminum production was estimated to have decreased to 790,000 t in 2019 from 802,000 t in 2018. Aluminum production was carried out by MAC at its smelter in Ras Al Khair; the company also produced an estimated 300,000 t of rolled aluminum in 2019. MAC's aluminum rolling mill had the capacity to produce 460,000 metric tons per year (t/yr) of secondary aluminum products as well as 130,000 t/yr of can recycling capacity (table 1; Saudi Arabian Mining Co., 2020, p. 142).

Copper.—MBCC, which was the leading copper producer in Saudi Arabia in 2019, increased its copper production at the Jabal Sayid Mine to 60,910 t in 2019 from 50,340 t in 2018. Copper output was a record for the company in 2019 and 2018. The increase in copper output was attributed to higher ore grade processing and throughput. Proven and probable reserves at the Jabal Sayid Mine were 13 Mt grading 2.29% copper and 0.24 gram per metric ton (g/t) gold. In addition to copper production, the Jabal Sayid Mine produced unspecified quantities of cobalt, lead, nickel, silver, sulfur, and zinc. In 2019, MBCC carried out an exploration program to extend the mine's life, which was estimated to be 17 years when production commenced in 2015 (Barrick Gold Corp., 2020, p. 140, 145; Saudi Arabian Mining Co., 2020, p. 151).

AMAK, which was the second-ranked producer of copper in Saudi Arabia in 2019, mined copper at the Masane Al Kobra Mine and produced 6,033 t of copper compared with 6,016 t in 2018. By the end of 2019, the proven reserves at Al Houra, the Moeath, and the Saadah mining zones were 3.24 Mt of ore grading 0.8% copper and 4.44 Mt of probable reserves grading 0.9% copper. AMAK was a joint venture of local investors (50%), Trecora Resources of the United States (33.4%), and Arab Mining Co. of Jordan (16.6%). MGBM, which mainly focused on gold production, also produced copper concentrate as a byproduct of its gold operations at the Al-Amar Mine. In 2019, the company reported producing 10,000 t of copper concentrate. MGBM exported its copper concentrates to South America (Trecora Resources, 2020, p. 17, 19).

Gold.—MGBM was the main gold producer in the country; it produced gold at six mines in 2019. MGBM's gold production decreased by 5% to 12,258 kg in 2019 from 12,905 kg in 2018. Most of the gold output was from the Ad Duwayhi Mine, which produced 8,192 kg. Production of gold from other mines included that of the Bulghah Mine (1,528 kg), the Al Amar Mine (821 kg); the As Suq Mine (598 kg), the Mahd Adh-Dahab Mine (729 kg),

and the Sukhaybarat Mine (390 kg) (Saudi Arabian Mining Co., 2020, p. 186).

AMAK began an independent feasibility study for the Guyan gold project, which is located 190 km east of the city of Khamis Mushait in southwestern Saudi Arabia. The Jabal Guyan deposit was estimated to hold about 2.3 Mt of ore grading 3.08 g/t gold for a total of 7,090 kg of gold. AMAK completed an advanced scoping study and exploration drilling program in 2017 and a feasibility study for an open pit mine at the Guyan site and a processing plant at the Al Masane copper-zinc site in 2018. In 2019, AMAK signed a process engineering and design services agreement in April, updated its Joint Ore Reserves Committee (JORC)-compliant resource estimate in August, secured financing by Saudi Investment Development Fund in December, and planned to begin mechanical installations in March 2020. Gold production at the new Guyan Mine was expected to begin in 2020 and the mine was expected to have 1,555 kilograms per year of capacity by 2021 (Al Masane Al Kobra Mining Co., 2022).

In 2019, Gold and Minerals Ltd., which was a joint venture of Abdul Rahman Saad Al-Rashid Co. (66% interest) and Kefi Gold and Copper plc of Australia (34% interest), explored for gold resources at the Jibal Qutman prospect and for copper and gold in the Hawiah permit area. The company set a 1-million-troy-ounce (31,100-kg) gold-equivalent deposit target for its exploration and development work at the Jibal Qutman prospect, which is located in Saudi Arabia's little-explored Precambrian Shield. Gold and Minerals Ltd., which identified more than 700,000 troy ounces (21,800 kg) of gold-equivalent resources in 2017, was evaluating the option of building an open pit heap-leach gold mine at the Jibal Qutman site while continuing the exploration for additional shallow gold resources at the site. In 2019, the company's drilling program at the Hawiah prospect confirmed the presence of a large-scale volcanic massive sulfide mineralization that contains copper, gold, silver, and zinc. Kefi planned more than 69 diamond drills in 2020. The Hawiah prospect is located in the Wadi Bidah Mineral District in the southwestern part of the Arabian Shield of Saudi Arabia (Kefi Gold and Copper plc, 2020).

Iron and Steel.—Saudi Arabia's production of DRI decreased to 5.8 Mt in 2019 from 6.0 Mt in 2018, and its raw steel output increased slightly (by 4,000 t) to 8,191,000 t in 2019 from a revised 8,187,000 t in 2018. Raw steel production reported in table 1 for 2015–17 reflects the output of the country's main producer, Saudi Iron and Steel Co. (Hadeed) only, whereas the production reported for 2018 and 2019 is for the Nation's total output. Hadeed, which was a wholly owned subsidiary of SABIC, produced a wide range of iron and steel products. The company's production decreased by 8% to about 4.7 Mt in 2019 from 5.1 Mt in 2018 owing to a decrease in domestic demand. Al-Ittifaq Steel Products Co. produced billet, DRI, pelletized iron, raw steel, reinforced-steel bar, wire rods, and other iron and steel products. The company owned and operated a 2.5-million-metric-ton-per-year (Mt/yr)-capacity iron pellet plant, a 2.5-Mt/yr DRI plant, a 3.0-Mt/yr scrap metal recycling mill, and a 2.8-Mt/yr rolling mill (tables 1, 2; Al-Ittifaq Steel Products Co., 2020; SABIC, 2020, p. 34; World Steel Association, 2020a, p. 11).

Titanium.—Advanced Metal Industries Cluster and Toho Titanium Metal Co. Ltd. (ATTM)—which was a joint venture of Advanced Metal Industries Cluster Co., Ltd. (AMIC) (65% interest) and Toho Titanium Co. of Japan (35% interest)—completed the construction of a new titanium sponge plant at Yanbu Industrial City on the Red Sea coast in western Saudi Arabia. The titanium sponge plant started production in October following a long delay caused by the increased cost and unavailability of raw material. The plant had the capacity to produce 15,600 t/yr of titanium sponge. AMIC was created in 2014 by National Titanium Dioxide Co. Ltd. (Cristal) and National Industrialization Company-Tasnee to develop titanium production in Saudi Arabia. AMIC had a smelter in Jizan City, which is located in the southwestern part of the country, to produce titanium slag for use by ATTM's titanium sponge plant at Yanbu. The smelter had the capacity to produce 500,000 t/yr of titanium slag and 250,000 t/yr of pig iron as a byproduct (Trimble Solutions Corp., 2018; Argus Media Group, 2019; National Industrialization Company-Tasnee, 2021).

Zinc.—AMAK was Saudi Arabia's leading producer of zinc in 2019. The company increased its zinc production to 21,139 t in 2019 from 15,051 t in 2018. AMAK's zinc output came from the Masane Al Kobra Mine, which is located in the Najran Region about 640 km southeast of Jeddah. By the end of 2019, the proven reserves at the Al Houra, the Moyeath, and the Saadah mining permits were 3.24 Mt of ore grading 3.9% zinc and the probable reserves were 4.44 Mt grading 4.4% zinc. MGBM also produced zinc at the Al-Amar gold mine as a byproduct of gold mining. The company reported that it had produced 18,000 t of zinc concentrate in 2019 and had exported the entire amount to Europe. MBCC also produced an unspecified amount of zinc as a byproduct of copper mining at the Jabal Sayid copper mine (Saudi Arabian Mining Co., 2020, p. 151; Trecora Resources, 2020, p. 17, 19; Al Masane Al Kobra Mining Co., 2022).

Industrial Minerals

Cement.—Saudi Arabia's level of cement production, which increased to 44.3 Mt in 2019 from 42.2 Mt in 2018, remained less than the production levels of 2015–17, which averaged 55.0 Mt/yr. Because of reduced activity in the construction sector, operations at many cement plants in the country slowed between 2016 and 2019 compared with that of previous years, resulting in decreased production. Nineteen companies operated 22 portland and white cement plants in Saudi Arabia in 2019. Southern Province Cement Co., which was a majority Government-owned (52%) company, was the leading producer of cement in the country in terms of tonnage; it produced a total of 6.4 Mt at its three plants, followed by Saudi Cement Co. (5.7 Mt), Yamamah Cement Co. (3.9 Mt), Yanbu Cement Co. (3.6 Mt), Qassim Cement Co. (3.4 Mt), Al Madina Cement Co. (2.7 Mt), Riyadh Cement Co. (2.5 Mt), Eastern Cement Co. (2.4 Mt), and Arabian Cement Co. (2.2 Mt) (table 1; Davids, 2019; General Authority of Statistics, 2020).

Clay (Kaolin).—Saudi Arabia's kaolin production had been gradually increasing during the past 5 years. Kaolin output amounted to 227,000 t in 2019 compared with 216,000 t in 2018. Production came mainly from IMC's Az Zabirah Mine.

The company's total proved and probable reserves of kaolin at the Az Zabirah ML deposit were estimated to be 2.5 Mt and the reserve life in 2019 was 18 years (Saudi Arabian Mining Co., 2020, p. 98–101).

Nitrogen.—Saudi Arabia produced and exported ammonia, DAP, MAP, and urea. Ma'aden's affiliates MPC and MWSPC produced ammonia at the Ras Al Khair complex for use in the manufacturing of DAP and MAP and for direct sales. MPC and MWSPC produced 1.2 Mt and 1.0 Mt of ammonia, respectively, in 2019. MPC and MWSPC produced 2.9 Mt and 2.3 Mt of ammonium phosphate, respectively, in 2019 for a total of 5.2 Mt (Saudi Arabian Mining Co., 2020, p. 134).

Saudi Arabia's production of urea was estimated to have decreased to 2.1 Mt of nitrogen content in 2019 from 2.3 Mt in 2018. However, Saudi Arabian Fertilizer Co. (Safco) reported producing about 5.6 Mt (2.6 Mt of nitrogen content) of urea in 2019, which was an 8% decrease from the 6.1 Mt (2.8 Mt of nitrogen content) produced in 2018. Safco, which was a joint venture of SABIC (42.99%), private investors (44.77%), and General Organization for Social Insurance (12.24%), was created to produce, process, manufacture, and market ammonia and urea fertilizers. Safco had five urea plants (Safco 2, Safco 3, Safco 4, Safco 5) and the National Chemical Fertilizer Co. (Ibn Al Bitar), which are located in Jubail Industrial City in Saudi Arabia's Eastern Region (tables 1, 2; Saudi Arabian Fertilizer Co., 2020, p. 9).

Phosphate Rock.—In 2019, Maaden, through its subsidiaries MCP and MWSPC, mined more than 6.5 Mt of phosphate rock at the Al Jalamid and the Al Khabra Mines. The company produced a total of 5.2 Mt of DAP fertilizer at its two plants in Ras Al Khair Industrial City, which is located 60 km north of Jubail in the Eastern Region. MWSPC started phosphate rock production at the Al Khabra Mine, which had the capacity to produce 12 Mt/yr of phosphate rock and 5 Mt/yr of concentrated phosphate. Total estimates of proved and probable phosphate rock reserves at the Al Jalamid, the Al Khabra, and the Umm Wu'al deposits were 1,346.5 Mt in 2019 grading 16.8% P₂O₅ for a total of 225.9 Mt of P₂O₅ (table 1; Saudi Arabian Mining Co., 2020, p. 99, 114, 116).

MPC operated at full capacity in 2019 and produced about 3.0 Mt of ammonium phosphate at its plant in Ras Al Khair Industrial City. MWSPC produced 2.3 Mt of ammonium phosphate in 2019 and ramped up its capacity to 3 Mt/yr by yearend. MWSPC started producing ammonia, DAP, MAP, phosphoric acid, and sulfuric acid in 2017 at the Wa'ad Al Shamal mining and processing complex. The Wa'ad Al Shamal complex, which is located about 45 km northeast of the town of Turaif in the Northern Border Region, included the Al Khabra phosphate rock mine and six phosphate manufacturing plants. MWSPC signed an engineering, procurement, and construction contract to build a third ammonia plant, which had a planned capacity to produce 1.1 Mt/yr. The plant was expected to be completed in 2021 and to add 1 Mt/yr of ammonium phosphate fertilizer capacity each year in 2023, 2024, and 2025 (Saudi Arabian Mining Co., 2020, p. 116, 134).

Mineral Fuels

Natural Gas and Petroleum.—Saudi Aramco produced 13.2 million barrels (Mbbbl) of petroleum equivalent per day of hydrocarbon in 2019 compared with 13.6 Mbbbl of petroleum equivalent per day in 2018. Crude petroleum production decreased by 5% to 3.58 Gbbl in 2019 from 3.77 Gbbl in 2018. Marketable (dry basis) natural gas production increased to 113.6 billion cubic meters in 2019 from 112.3 billion cubic meters in 2018, and refined petroleum products output decreased slightly to 0.9 Gbbl from 1.0 Gbbl (revised) in 2018. Saudi Aramco maintained a maximum sustainable capacity of 12 Mbbbl/d of crude petroleum, which allowed the company to respond quickly to global changes in petroleum supply and demand (table 1; Saudi Arabian Oil Co., 2020, p. 26, 36).

In August 17, a drone attack was launched against the Shaibah natural gas liquids processing facility in eastern Saudi Arabia; the attack resulted in fires at the facility, but production was not affected. A wider attack took place on September 14 against petroleum-processing facilities at Abqaiq and Khurais in eastern Saudi Arabia. The attack disabled 54% of Saudi Aramco's crude petroleum production capacity and caused large fires at the processing facilities. The fires lasted several hours before being put out. Saudi Aramco was able to restore production at the affected facilities by October 14 (Chmaytelli and El Gamal, 2019; U.S. Department of State, 2019; Saudi Arabian Oil Co., 2020, p. 8).

In 2019, Saudi Aramco changed its ownership structure from a wholly Government-owned company to a majority Government-owned company. Saudi Aramco's initial public offering (IPO) was launched on December 11. The company offered 1.5% of its estimated value of \$1.7 trillion for trading at the Saudi Arabia stock exchange Tadawul. The IPO was part of a larger Government plan (Vision 2030) to transform the Saudi economy. Vision 2030 aimed to diversify the Saudi economy beyond the petroleum sector while addressing budget deficits that have faced the Government since the sharp decrease in petroleum prices in 2014 (Gross, 2019).

The major onshore oilfields in Saudi Arabia included the Ghawar Field, which, according to Saudi Aramco, was the world's largest discovered conventional onshore oilfield in terms of production and reserves and had the capacity to produce 5.8 Mbbbl/d; the Khurais Field (1.2 Mbbbl/d); the Shaybah Field (1 Mbbbl/d); the Khurasaniyah and the Qatif Fields (0.5 Mbbbl/d each); and the Abqaiq Field (0.4 Mbbbl/d). The Safaniya Field (1.2 Mbbbl/d), the Manifa Field (0.9 Mbbbl/d), and the Zuluf Field (0.68 Mbbbl/d) were the country's main offshore oilfields. Most of natural gas production in Saudi Arabia came from oilfields as a byproduct of the production of crude petroleum and condensate; however, the Arabiyah, the Hasbah, and the Karan Fields were the country's main offshore gasfields and produced only natural gas (table 2; U.S. Energy Information Administration, 2017, p. 6, 14; Saudi Arabian Oil Co., 2020, p. 51; 2021, p. 53).

Outlook

Production of metal commodities, such as aluminum, copper, gold, titanium, and zinc, as well as industrial mineral

commodities, such as cement, gypsum, kaolin, phosphate fertilizers, phosphate rock, pozzolan, and sand and gravel, are expected to increase in the next 5 years as the country's mining companies ramp up production at existing production facilities and with the commissioning of new production facilities. AMAK is expected to become the second gold mining company in Saudi Arabia with the commissioning of its Guyan gold mine in 2020. Exports of nitrogen- and phosphate-based fertilizers are expected to increase in the short term as Ma'aden, which is the country's main producer of fertilizers, planned to produce 9 Mt/yr of ammonium phosphate following the completion of its third phosphate project at Wa'ad Al Shamal by 2024. The output of cement, iron and steel products, and other building and construction materials would depend on domestic demand, which is expected to remain weak owing to low petroleum prices and to the coronavirus disease 2019 (COVID-19) pandemic.

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TABLE 1
SAUDI ARABIA: PRODUCTION OF MINERAL COMMODITIES¹

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

Commodity ²	2015	2016	2017	2018	2019	
METALS						
Aluminum:						
Bauxite	1,148	3,843	3,708	3,885	4,050 ^e	
Alumina	846	1,429	1,484	1,774	1,839	
Metal:						
Primary	682	740	786	802	790 ^e	
Products, flat-rolled	59	101	153	231	300 ^e	
Copper, mine, concentrates:						
Gross weight	metric tons	46,253	110,000	268,388 ^r	281,800 ^r	277,600
Cu content	do.	11,600	27,500	67,097 ^r	70,450 ^r	69,400
Ferroalloys:						
Ferromanganese	do.	7,000	10,000	10,000	23,000	39,000
Silicomanganese	do.	63,000	55,000	65,000	85,400	103,000
Gold, mine, Au content	kilograms	5,078	7,010	10,333	12,905	12,353
Iron and steel:						
Direct-reduced iron		5,800	5,119	4,812	6,000 ^r	5,790
Steel, raw steel ³		5,229 ^e	5,461	4,831	8,187 ^r	8,191
Lead, smelter, secondary	metric tons	37,000 ^e	50,000 ^e	82,000	68,000	68,000
Silver, mine, concentrate, Ag content	kilograms	4,500	4,710	5,069	5,760	5,590
Zinc, mine, concentrate, Zn content ⁴	metric tons	18,757	2,550	15,219	24,000	30,000 ^e
INDUSTRIAL MINERALS						
Bauxite, low grade		797	625	417	438	297
Cement, hydraulic		61,900	55,943	47,134	42,181	44,341
Clay:						
Kaolin		187	196	206	216	227
Unspecified		7,650	9,240	9,702	10,187	10,696
Feldspar		179	188	197	206	216
Fertilizers, diammonium phosphate		5,100 ^r	5,400 ^r	5,670 ^r	5,444 ^r	5,716
Gypsum, mine		2,780	3,000	3,150	3,307	3,472
Magnesite:						
Caustic-calcined		37	36	38	43	44 ^e
Dead-burned		--	--	12	26	27 ^e
Nitrogen, N content:						
Ammonia		3,040	3,684	4,000	4,300	4,000
Urea		2,248	2,100	1,800	2,300	2,100
Phosphate rock:						
Gross weight		4,100	5,400	5,670	6,090	6,500 ^e
P ₂ O ₅ content, 32% P ₂ O ₅		1,281	1,730	1,800	1,949	2,100 ^e
Pumice and related minerals, pozzolan		480	504	509	555	560 ^e
Salt		2,000	2,400	2,520	2,646	2,778
Sand and gravel, industrial, unspecified		1,230	1,300	1,365	1,433	1,505
Stone, sand, and gravel, construction:						
Sand and gravel:						
Sand		31,800	22,155	23,000	24,000	25,000
Gravel		330,000	347,000	364,000	382,200	401,310
Iron sand		708	706	741	778	817
Stone:						
Crushed:						
Basalt		--	30	32	33	35
Dolomite		203	2,131	2,237	2,348	2,465
Limestone, for cement		60,000	63,000	66,150	69,457	72,930
Marble, for industrial use		2,700	2,800	2,940	2,947	3,094
Schist, scoria		576	604	634	665	600

See footnotes at end of table.

TABLE 1—Continued
SAUDI ARABIA: PRODUCTION OF MINERAL COMMODITIES¹

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

Commodity ²	2015	2016	2017	2018	2019		
INDUSTRIAL MINERALS—Continued							
Stone, sand, and gravel, construction:—Continued							
Stone:—Continued							
Dimension:							
Granite	1,100	1,053	1,105	1,160	1,218		
Limestone, block	132	104	109	114	120		
Marble, block	13 ^r	12 ^r	13 ^r	13 ^r	14		
Sulfur, hydrocarbon processing, S content	4,900	6,000	6,500	6,500 ^e	6,500 ^e		
Talc and related minerals, pyrophyllite	40	42	44	46	48		
MINERAL FUELS AND RELATED MATERIALS							
Natural gas:							
Gross	million cubic meters		120,000	124,000	129,000	133,000 ^e	135,000 ^e
Dry basis	do.		99,200	105,300	109,300	112,300	113,600
Ethane	do.		9,210	9,513	9,678	10,300 ^r	9,900
Petroleum:							
Crude	million 42-gallon barrels		3,720	3,818	3,635	3,766	3,580
Natural gas liquids:							
Butane	do.		120	120	127	120 ^r	116
Condensate	do.		83	83	79	79	123
Natural gasoline	do.		91	91	91	102 ^r	103
Propane	do.		181	181	191	206 ^r	195
Refinery:							
Asphalt	do.		22	18	17	14	15
Coke	do.		27	80	84	84	27
Distillate fuel oil	do.		351	385	394	392	386
Gasoline	do.		180	202	204	199	194
Kerosene	do.		77	90	90	96	85
Liquefied petroleum gas	do.		17	16	16	17	15
Naphtha	do.		69	76	74	60	51
Residual fuel oil	do.		163	168	170	166	155
Total	do.		906	1,030	1,050	1,030	928

^eEstimated. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through November 3, 2020. 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, carbon black, cobalt, lime, methanol, nickel, and sponge titanium may have been produced, but available information was inadequate to make reliable estimates of output.

³Raw steel production reported for 2015–17 reflects the output of the country's main producer, Saudi Iron and Steel Co. (Hadeed) only, whereas the production reported for 2018 and 2019 is the national output.

⁴Assumes a grade of 50% zinc.

TABLE 2
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons, unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Ma'aden Bauxite and Alumina Company (MBAC) [Saudi Arabian Mining Co. (Ma'aden), 74.9%, and AWA Saudi Ltd., 25.1%]	Refinery at Ras Al Khair, Jubail Industrial City, Eastern Region	1,800
Aluminum:			
Primary	Ma'aden Aluminium Co. (MAC) [Saudi Arabian Mining Co. (Ma'aden), 74.9%, and Alcoa Inc, 25.1%]	Smelter at Ras Al Khair, Jubail Industrial City, Eastern Region	800
Secondary	Ma'aden Rolling Co. (MRC) [Saudi Arabian Mining Co. (Ma'aden), 74.9%, and Alcoa Inc, 25.1%]	Rolling plant at Ras Al Khair, Jubail Industrial City, Eastern Region	460
Recycled	do.	do.	130
Bauxite:			
Metallurgical	Ma'aden Bauxite and Alumina Company (MBAC) [Saudi Arabian Mining Co. (Ma'aden), 74.9%, and Alcoa Inc, 25.1%]	Mine at Al Ba'itha, Al Qasim Region	4,600
Low-grade	Industrial Minerals Co. (IMC) [Saudi Arabian Mining Co. (Ma'aden), 100%]	Az Zabirah Mine, Ha'il Region	1,100
Caustic soda	Sahara and Ma'aden Petrochemical Co. (SAMAPCO) [Sahara Petrochemical Co., 50%, and Saudi Arabian Mining Company (Ma'aden), 50%]	Plant at Ras Al Khair, Jubail Industrial City, Eastern Region	25
Do.	Arabian Alkali Co. (SODA)	Plant at Jubail Industrial City, Eastern Region	55
Do.	Saudi Factory for Chlorine and Alkalies (SACHLO)	Plant in Riyadh Region	NA
Cement:			
Gray portland	Al Jouf Cement Co.	Plant South of Turaif, Northern Border Region	1,750
Do.	Al Madina Cement Co.	Plant at Al Madinah, Medina Region	3,000
Do.	Al Safwa Cement Co. (El Khayat Group, 50%; General Pension Agency, 25%; General Organization for Social Insurance, 25%)	Plant in Mecca Region	2,000
Do.	Arabian Cement Co. Ltd.	Plant at Rabigh, Mecca Region	4,800
Do.	Eastern Province Cement Co.	Plant at Al Khursaniyah, Eastern Region	3,400
Do.	Hail Cement Co.	Plant at Turba, Ha'il Region	2,000
Do.	Najran Cement Co.	Plant at Aakfa, Najran Region	3,000
Do.	Northern Region Cement Co.	Plant at Turaif, Northern Border Region	1,700
Do.	Qassim Cement Co.	Plant at Jal al Watah, Buraydah, Al Qasim Region	4,000
Do.	Riyadh Cement Co.	Plant 3 in Riyadh Region	3,800
Do.	Saudi Cement Co.	Plant at Al Hofuf, 120 kilometers southwest of Dammam, Eastern Region	8,600
Do.	Southern Province Cement Co. (Government, 52%)	Plant at Suq Al Ahad, Jazan Region	7,500
Do.	do.	Plant at Bishah, southeast Jeddah, Mecca Region	2,000
Do.	do.	Plant at Tihama, Asir Region	1,800
Do.	Tabuk Cement Co.	Plant in Tabuk Region	1,300
Do.	Umm Al Qura Cement Co.	Plant near Taif, Mecca Region	2,000
Do.	United Cement Co.	Plant at Al Sadiya, Mecca Region	2,000
Do.	Yamama Cement Co. Ltd.	Plant in Riyadh Region	6,300
Do.	Yanbu Cement Co.	Plant at Yanbu, Medina Region	6,400

See footnotes at end of table.

TABLE 2—Continued
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons, unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement:—Continued				
White		Al-Gharbiah Cement Factory	Plant at Jeddah, Mecca Region	250
Do.		Saudi White Cement Co.	Plant 30 kilometers southwest of Riyadh, Riyadh Region	200
Clay, kaolin		Ma'aden Industrial Minerals Co. (IMC) [Saudi Arabian Mining Co. (Ma'aden)]	Mine at Ranyah in Mecca Region	250
Do.		Unspecified producers	NA	100
Copper in concentrate		Al Masane Al Kobra Mining Co. (AMAK) (local investors, 50%; Trecora Resources, 35%; Arab Mining Co., 15%)	Al Masane Mine, Najran Region	50
Do.		Ma'aden Barrick Copper Co. (MBCC) [Barrick Gold Corp., 50%, and Saudi Arabian Mining Co. (Ma'aden), 50%]	Jabal Sayid Mine, Medina Region	280
Do.		Ma'aden Gold and Base Metals Co. (MGBMC) [Saudi Arabian Mining Co. (Ma'aden)]	Al Amar Mine, Riyadh Region	10
Dolomite		Saudi Lime Industries Co.	Mine and plant in Riyadh Region	1,000
Do.		Saudi Dolomite Co. Ltd.	Mine and plant at Al Khobar, Eastern Region	1,500
Feldspar		United Mining Investment Co.	Mine at Rabigh, Mecca Region	30
Ferroalloys		Gulf Ferro Alloys Co. (SABAYEK)	Plant at Jubail Industrial City, Eastern Region	140,000
Gold	kilograms	Ma'aden Gold and Base Metals Co. (MGBMC) [Saudi Arabian Mining Co. (Ma'aden)]	Al Amar Mine, Riyadh Region; Ad Duwayhi Mine, Mecca Region; As Suq Mine, Mecca Region; Bulghah Mine, Medina Region; Mahd Adh-Dahab Mine, Medina Region; Sukhaybarat Mine, Medina Region	13,000
Granite	cubic meters	Red Sea Mining Co. Ltd.	11 quarries in Najran Region and at Ranyah in Mecca Region	18,000
Do.	do.	Tanhat Mining Co. Ltd.	Quarries in Ar-Rowaidah, Riyadh Region, Jamour, Najran Region, Ranyah, Mecca Region, Samakh, Asir Region	360,000
Gypsum		National Gypsum Co.	Plants at Damman, Jeddah, Riyadh, Yanbu	960
Do.		Al-Zahid Industrial and Mining Group	Quarry at Taymah, Tabuk Region	NA
Do.		Mada Gypsum Co. (Al Rajhi Holding, 100%)	Plant at Yanbu Industrial City, Medina Region	400
Do.		Global Gypsum Co. Ltd.	do.	300
Iron and steel:				
Direct-reduced iron		Saudi Iron and Steel Co. (Hadeed) [Saudi Arabia's Basic Industries Corp. (SABIC), 100%]	Plants A, B, C, D, and E at Jubail, Eastern Region	5,500
Do.		Direct Reduction Iron Co. Ltd. (Al-Ittefaq Group, 100%)	Plants I and II at Dammam, Eastern Region	2,500
Iron pellets		do.	Iron pelletization plant at Dammam, Eastern Region	2,500
Pig iron		Advanced Metal Industries Cluster Co., Ltd. (AMIC)	Smelter at Jizn City, Jazan Region	250
Steel:				
Raw		National Steel Co. Ltd. (Al-Ittefaq Group, 100%)	Plant at Dammam, Eastern Region	1,300
Do.		Saudi Iron and Steel Co. (Hadeed) (Saudi Arabia's Basic Industries Corp. (SABIC), 100%)	Plant at Jubail, Eastern Region	5,500
Do.		Solb Steel	Plant at Jizan Economic City, Jazan Region	1,200

See footnotes at end of table.

TABLE 2—Continued
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons, unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel:—Continued				
Steel:—Continued				
Raw—Continued		Rajhi Steel Industries Co. Ltd.	Plant at Jeddah, Mecca Region	850
Products		Arab Steel Co. (Al-Ittefaq Group , 100%)	Plant at Dammam, Eastern Region	4,500
Do.		National Steel Co. Ltd. (Al-Ittefaq Group , 100%)	Rolling mill at at Dammam, Eastern Region	2,800
Lead, smelter, secondary		National Lead Smelting Co. (National Industrialization Company—Tasnee, 100%)	Plant in Riyadh Region	100
Lime:				
Hydrated		Astra Mining (Astra Industrial Group, 60%, and Tharawat Holding, 40%)	Plant at Al Kharj Industrial City	66
Do.		Saudi Lime Industries Co.	Plant in Riyadh Region	100
Quick		Astra Mining (Astra Industrial Group, 60%, and Tharawat Holding, 40%)	Plant at Al Kharj Industrial City, Riyadh Region	99
Do.		Saudi Lime Industries Co.	Plant in Riyadh Region	400
Magnesite:				
Crude ore		Ma'aden Industrial Minerals Co. (IMC) [Saudi Arabian Mining Co. (Ma'aden)]	Mine at Al Ghazalah, Medina Region	90
Caustic-calcined		do.	Processing plant, Al Madinah Al Munawwara Industrial City	39
Dead-burned		do.	do.	32
Methanol		Saudi Methanol Co. (Ar-Razi) (Mitsubishi Gas Chemical Consortium, 50%, and Saudi Arabia's Basic Industries Corp. (SABIC), 50%)	Plant at Jubail Industrial City, Eastern Region	850
Do.		National Methanol Co. (Ibn Sina) [Saudi Arabia's Basic Industries Corp. (SABIC), 50%; Celanese Corp., 25%; Duke Energy, 25%]	do.	1,000
Natural gas, gross	million cubic meters	Saudi Arabian Oil Co. (Saudi Aramco) (Government, 100%)	Gawar field, onshore	75,000
Do.	do.	do.	Arabiyah gasfield, offshore	12,408
Do.	do.	do.	Hasbah gasfield, offshore	34,122
Do.	do.	do.	Karan gasfield, offshore	18,612
Do.	do.	do.	Safaniya oilfield, offshore	10,000
Do.	do.	do.	Zuluf oilfield, offshore	10,000
Do.	do.	do.	Wasit gas processing plant at Jubail Industrial City, Eastern Region	27,800
Nitrogen:				
Ammonia		Al Jubail Fertilizer Co. (Al-Bayroni) [Saudi Arabia's Basic Industries Corp. (SABIC), 50%, and Taiwan Fertilizer Co. Ltd., 50%]	Plant at Jubail Industrial City, Eastern Region	1,200
Do.		Ma'aden Phosphate Co. (MPC) [Saudi Arabian Mining Co. (Ma'aden)]	Plant at Ras Al Khair, Jubail Industrial City, Eastern Region	1,200
Do.		Ma'aden Wa'ad Al- Shamal Phosphate Mining Co. (MWSPC) [Saudi Arabian Mining Co. (Ma'aden), 60%; Mosaic Co., 25%; Saudi Arabia's Basic Industries Corp. (SABIC), 15%]	Plant at Ras Al Khair, 60 kilometers north of Jubail, Eastern Region	1,200
Do.		Saudi Arabian Fertilizer Co. (Safco) (Saudi Arabia's Basic Industries Corp. (SABIC), 42.99%; public Investors, 44.77%; General Organization for Social Insurance, 12.24%)	Plant at Jubail Industrial City, Eastern Region	2,300

See footnotes at end of table.

TABLE 2—Continued
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons, unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Nitrogen:—Continued				
Ammonia—Continued		National Chemical Fertilizer Co. (Ibn Al-Baytar) [Saudi Arabia's Basic Industries Corp. (SABIC), 50%, and Saudi Arabian Fertilizer Co. (Safco), 50%]	Plant at Jubail Industrial City, Eastern Region	2,000
Urea		do.	do.	2,000
Do.		Saudi Arabian Fertilizer Co. (Safco) [Saudi Arabia's Basic Industries Corp. (SABIC), 42.99%; public Investors, 44.77%; General Organization for Social Insurance, 12.24%]	Safco 2, Safco 3, Safco 4, Safco 5 plants in Jubail Industrial City, Eastern Region	3,400
Pozzolan		Consortium of Volcanic Pozzolan Producers	Quarries and plant in Jeddah	NA
Do.		do.	Quarries and plant in Khamis Mushait	NA
Petroleum:				
Crude	million 42-gallon barrels	Saudi Arabian Oil Co. (Saudi Aramco) (Government, 100%)	Ghawar oilfield, onshore	2,117
Do.	do.	do.	Safaniya oilfield, offshore	438
Do.	do.	do.	Shaybah oilfield, onshore	365
Do.	do.	do.	Manifa oilfield, onshore	328
Do.	do.	do.	Qatif oilfield, onshore	182
Do.	do.	do.	Khursaniyah oilfield, offshore	182
Do.	do.	do.	Zuluf oilfield, offshore	248
Do.	do.	do.	Abqaiq oilfield, onshore	146
Refined products	do.	Jeddah Oil Refinery Co. [Saudi Arabian Oil Co. (Saudi Aramco), 100%]	Refinery at Jeddah	32
Do.	do.	Rabigh Refining & Petrochemical Co. (PetroRabigh) [Saudi Arabian Oil Co. (Saudi Aramco), 37.5%; Sumitomo Chemical Co., 37.5%; private 25%]	Refinery at Rabigh, Mecca Region	146
Do.	do.	Riyadh Oil Refinery Co. [Saudi Arabian Oil Co. (Saudi Aramco), 100%]	Refinery in Riyadh Region	45
Do.	do.	Saudi Arabian Oil Co. (Saudi Aramco) (Government, 100%)	Refinery at Ras Tanura, Jubail, Eastern Region	201
Do.	do.	do.	Refinery at Yanbu, Medina Region	86
Do.	do.	Saudi Aramco Mobil Refinery Co. Ltd. [Saudi Arabian Oil Co. (Saudi Aramco), 50%, and Mobil Yanbu Refining Co. Inc., 50%]	do.	146
Do.	do.	Saudi Aramco Shell Refining Co. [Saudi Arabian Oil Co., (Saudi Aramco), 50%, and Shell Saudi Arabia Refining Ltd., 50%]	Refinery at Jubail, Eastern Region	113
Do.	do.	Saudi Aramco Total Refining and Petrochemical Co. [Saudi Arabian Oil Co. (Saudi Aramco), 62.5%, and Total S.A., 37.5%]	do.	146
Do.	do.	Yanbu Aramco Sinopec Refining Co. Ltd. (YASREF) [Saudi Arabian Oil Co. (Saudi Aramco), 62.5%, and China Petrochemical Corp. (SINOPEC), 37.5%]	Refinery at Yanbu, Medina Region	146
Phosphate:				
Ore		Ma'aden Phosphate Co. (MPC) [Saudi Arabian Mining Co. (Ma'aden), 70%, and Saudi Arabia's Basic Industries Corp. (SABIC), 30%]	Al Jalamid Mine, Northern Border Region	12,000
Do.		Ma'aden Wa'ad Al-Shamal Phosphate Mining Co. (MWSPC) [Saudi Arabian Mining Co. (Ma'aden), 60%, Mosaic, 25%, Saudi Arabia's Basic Industries Corp. (SABIC), 15%]	Al Khabra Mine, 45 kilometers northeast of Turaif, Northern Border Region	12,000

See footnotes at end of table.

TABLE 2—Continued
SAUDI ARABIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons, unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Phosphate:—Continued				
Products, fertilizers		Ma'aden Phosphate Co. (MPC) [Saudi Arabian Mining Co. (Ma'aden), 70%, and Saudi Arabia's Basic Industries Corp. (SABIC), 30%]	Plant at Ras Al Khair, 60 kilometers north of Jubail, Eastern Region	3,000
Do.		Ma'aden Wa'ad Al-Shamal Phosphate Mining Co. (MWSPC) [Saudi Arabian Mining Co. (Ma'aden), 60%, Mosaic Co., 25%, Saudi Arabia's Basic Industries Corp. (SABIC), 15%]	Plant at Wa'ad Al Shamal, Turaif, Northern Border Region	3,000
Salt		Al-Zahid Industrial and Mining Group	Mines in Eastern Region	3,000
Silica (industrial) sand		Adwan Chemical Industries Co. Ltd.	Eldarees Quarry, Ad Dohm, Riyadh	NA
Do.		Al Raddadi Group	Quarry at Taymah, Tabuk Region	1,000
Do.		Al-Zahid Industrial and Mining Group	do.	100
Do.		Gulf Sand (Al-Marbaie Group)	do.	NA
Silver	kilograms	Ma'aden Gold and Base Metals Co. (MGBMC) [Saudi Arabian Mining Co. (Ma'aden)]	Al Amar Mine, Riyadh Region; Ad Duwayhi Mine, Mecca Region; As Suq Mine, Mecca Region; Bulghah Mine, Medina Region; Mahd Adh-Dahab Mine, Medina Region; Sukhaybarat Mine, Medina Region	5,600
Sulfur		Saudi Arabian Oil Co. (Saudi Aramco) (Government, 100%)	Refineries and gas processing plants at Jeddah, Jubail, Rabigh, Ras Tanura, Riyadh, and Yanbu	6,500
Sulfuric acid		Basic Chemicals National Co. (BCNC) (Basic Chemical Industries, 100%)	Plant at Yanbu Industrial City, Medina Region	365
Do.		Ma'aden Phosphate Co. (MPC) [Saudi Arabian Mining Co. (Ma'aden), 70%, and Saudi Arabia's Basic Industries Corp. (SABIC), 30%]	Plant at Ras Al Khair, Jubail Industrial City, Eastern Region	4,900
Do.		Ma'aden Wa'ad Al-Shamal Phosphate Co. (MWSPC), [Saudi Arabian Mining Co. (Ma'aden), 60%; Mosaic Co., 25%; Saudi Arabia's Basic Industries Corp. (SABIC), 15%]	Plant at Wa'ad Al Shamal, Turaif, Northern Border Region	5,500
Do.		Saudi Arabian Fertilizer Co. (Safco) (Saudi Arabia's Basic Industries Corp. (SABIC), 42.99%; public investors, 44.77%; General Organization for Social Insurance, 12.24%)	Plant at Ras Al Khair, Jubail Industrial City, Eastern Region	130
Do.		National Company For Sulphur Products (NCSP)	Plant in Riyadh Region	170
Titanium:				
Slag		Advanced Metal Industries Cluster Co., Ltd. (AMIC) (100%)	Smelter at Jizn City, Jazan Region	500
Sponge	metric tons	Advanced Metal Industries Cluster and Toho Titanium Metal Co. Ltd. (ATTM) (Advanced Metal Industries Cluster Co., Ltd. (AMIC), 65%, and Toho Titanium Metal Co., 35%)	Plant at Yanbu, Medina Region	15,600
Zinc, Zn in concentrate		Al Masane Al Kobra Mining Co. (AMAK) (local investors, 50%; Trecora Resources, 33.4%; Arab Mining Co., 16.6%)	Al Masane Mine, Najran Region	50
Do.		Ma'aden Gold and Base Metals Co. (MGBM) [Saudi Arabian Mining Co. (Ma'aden)]	Al Amar Mine, Riyadh Region; and Mahd Adh-Dahab Mine, Medina Region	20

Do., do. Ditto. NA Not available.