



# 2020–2021 Minerals Yearbook

---

**IRAN [ADVANCE RELEASE]**

---

# THE MINERAL INDUSTRY OF IRAN

By Philip A. Szczesniak

**Note: In this chapter, information for 2020 is followed by information for 2021.**

In 2020, the hydrocarbon sector of Iran, which included the production of natural gas and crude petroleum, the refining of crude petroleum, and the distribution of hydrocarbons, was an important contributor to the country's economy. Among global producers of natural gas, Iran ranked third (after the United States and Russia), accounting for 6.5% of global output. In addition, Iran was the world's eighth-ranked producer of crude petroleum and condensate, accounting for a combined 3.5% of output, and was a member of the Organization of the Petroleum Exporting Countries (OPEC). Among metal and industrial mineral producers, Iran was the world's 2d-ranked producer of direct-reduced iron (DRI) and mined gypsum, (accounting for 28.8% and 11%, respectively, of the world's output); 4th-ranked producer of feldspar (9.8%); 6th-ranked producer of cement (1.6%), bentonite (2.3%), and kaolin (3.9%); 7th-ranked (not including the United States) producer of barite (3.0%); 9th-ranked producer of iron ore (iron content) (2.1%); and 10th-ranked producer of molybdenum (0.5%; estimated) (table 1; Barry, 2022; BP p.l.c., 2022, p. 15, 29; Crangle, 2022; Hatfield, 2022; McRae, 2022; Midrex Technologies Inc., 2022, p. 8; Organization of the Petroleum Exporting Countries, 2022b; Polyak, 2022; Simmons, 2022; Tuck, 2022).

Iran was estimated to hold the world's second-largest (behind Russia) natural gas reserves, accounting for 17.1% of proven worldwide natural gas reserves, and the fourth-largest crude petroleum reserves, accounting for 9.1% of proven worldwide crude petroleum reserves in 2020. Iran also held the world's largest barite reserves, second-largest feldspar reserves, eighth-largest fluor spar reserves, and the ninth-largest iron ore reserves (BP p.l.c., 2021, p. 16, 34; Briocche, 2021; McRae, 2021a, b; Tuck, 2021).

## Minerals in the National Economy

In 2020, the real gross domestic product (GDP) of Iran increased by 1.8% compared with a decrease of 1.3% (revised) in 2019. The country's nominal GDP was estimated to be \$938 billion by the International Monetary Fund (IMF). The hydrocarbon sector contributed 5.3% of the GDP in 2020 compared with 7.4% in 2019, whereas mining and manufacturing contributed 19.3% compared with 16.1% in 2019. There were 154,000 workers in the energy and petrochemical sectors. More than 114,000 workers were employed in the mining sector, accounting for about 0.4% of total employment in Iran (Australia Trade and Investment Commission, 2021; Central Bank of the Islamic Republic of Iran, 2021, p. 2; Progressive International, 2021; International Monetary Fund, 2022).

## Government Policies and Programs

The Ministry of Industry, Mine, and Trade (MIMT) issued 680 mining licenses and 1,020 mineral exploration licenses in Iran in 2020. The Mining Act of 1998 (based on Articles 44 and 45 in Chapter 4 of the 1978 Constitution of the Islamic Republic of Iran) and amendments to the Mining Act of 2013 govern the activities of the mineral sector in Iran. The Government-owned holding company Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), which was established in 2001, is responsible for the formulation and implementation of the country's policies on mineral exploration and mining, mine and plant construction and development, and royalty rates on mineral production. The Geological Survey and Mineral Exploration of Iran (GSI), which was a subdivision of the MIMT, is responsible for conducting geologic and mineral exploration studies and for the production of geologic maps. The Ministry of Petroleum (MOP), which was established in 1979, is responsible for supervising the exploration for and the extraction, marketing, and selling of crude petroleum, natural gas, and petroleum products. The Petroleum Act of 1987 and amendments in 2011 define the Government's authority in the petroleum sector (Iran Ministry of Industry, Mine, and Trade, 2015, [undated]; Geological Survey and Mineral Exploration of Iran, 2018; International Energy Agency, 2020; Iran Ministry of Petroleum, 2020; Tehran Times, 2021b; Iranian Mines and Mining Industries Development and Renovation Organization, [undated]).

The Iranian Integrated Petroleum Contract (IPC) was adopted in 2016 to attract foreign investment and technology to spur development of upstream crude petroleum and natural gas projects. New contract terms are set for a maximum of 20 years, with the possibility of a 5-year extension for enhanced petroleum recovery projects. The IPC requires that contracts involving the exploration, development, or production phases have an Iranian ownership of at least 51% (U.S. Energy Information Administration, 2019, p. 3–4).

## Production

Notable increases in mineral production in 2020 compared with production in 2019 included that of molybdenum (molybdenum content), which increased by 243%; gemstones (turquoise), by 101%; primary aluminum, by 65% (estimated); iron ore (iron content), by 50%; talc, by 33%; magnesite, by 30%; salt, by 19% (estimated); smelted copper (secondary) and kaolin (estimated), by 17% each; cement (estimated), refined copper (secondary), lime (estimated), and raw steel, by 13% each; and smelted copper (primary) and chromite (chrome content) (estimated), by 11% each. Notable decreases in production included that of manganese (manganese content), which decreased by 92% (estimated); kerosene, by 44%;

feldspar, by 19%; gold, by 18% (estimated); ferrochromium, by 17% (estimated); and celestite, by 15% (estimated). Data on mineral production are provided in table 1.

## Structure of the Mineral Industry

The Government controlled most large mineral companies through IMIDRO. The leading IMIDRO subsidiaries were Almahdi Aluminium Co. (aluminum), Esfahan Steel Co. (ESCO) (steel), Iran Alumina Co. (alumina), Iranian Aluminium Co. (IRALCO) (aluminum), Iran Minerals Production and Supply Co. (IMPASCO) (multiple minerals), Iran Zinc Mines Development Co. (lead and zinc), Khuzestan Steel Co. (KSC) (steel), Mobarakeh Steel Co. (MSC) (steel), and National Iranian Copper Industries Co. (NICICO) (copper and molybdenum). National Iranian Oil Co. (NIOC) was responsible for exploration and production of petroleum and natural gas. The Atomic Energy Organization of Iran (AEOI) was engaged in the exploration, mining, and treatment of uranium. Table 2 is a list of major mineral industry facilities.

## Mineral Trade

Mineral fuels accounted for about 42% of Iran's total exports of \$49.8 billion in 2020 compared with 49% of the \$59.4 billion total in 2019. The country's crude petroleum exports decreased to 0.404 million barrels per day (Mbbbl/d) in 2020 compared with 0.651 Mbbbl/d in 2019; the Asia region was the leading destination for crude petroleum exports. Iran exported 16.0 billion cubic meters of natural gas in 2020 compared with 16.9 billion cubic meters in 2019; Turkey and other countries in the Middle East were the leading destinations for the country's natural gas exports. Total imports were valued at \$46.6 billion in 2020 compared with \$52.2 billion in 2019. Imports of natural gas and petroleum products decreased to zero in 2020 from \$6 million in 2019 (BP p.l.c., 2020, p. 43; 2021, p. 45; Central Bank of the Islamic Republic of Iran, 2021, p. 16; Organization of the Petroleum Exporting Countries, 2022a, p. 46).

Nonfuel mineral commodities exported by Iran were valued at \$7.6 billion in 2020 compared with \$8.5 billion in 2019. Exports of steel and steel products, which accounted for a significant share of nonfuel mineral exports, totaled 9.7 million metric tons (Mt) and were valued at about \$4.1 billion in 2020 compared with \$4.5 billion in 2019 (a 10% decrease). Exports of copper and copper products decreased by about 17% to \$1.0 billion from \$1.2 billion in 2019. Exports of cement totaled 24.3 Mt and were valued at \$758 million in 2020. Other mineral commodities exported included gypsum, iron ore, lime, salt, soil and stone, and sulfur (Eghtesad Online, 2020; Financial Tribune, 2021b; Hellenic Shipping News, 2021).

The country's exports of goods to the United States were valued at just \$3.9 million in 2020. Trade between the United States and Iran had been and continued to be limited since the United States Government imposed restrictions on trade with Iran in 1979. Stone, sand, and cement valued at \$3,675 were the only mineral-related commodities exported by Iran to the United States. Total imports of goods from the United States were valued at \$36.3 million in 2020. Iron and steel mill products (valued at \$71,067) and nonferrous metals

(other) (\$19,635) were the only mineral-related commodities imported by Iran from the United States (U.S. Census Bureau, 2022a, b; U.S. Department of State, 2023).

## Commodity Review

### Metals

**Bauxite and Alumina, and Aluminum.**—Bauxite production in Iran in 2020 increased by 3.2% to an estimated 1.2 Mt. During the year, the Government remained focused on developing its bauxite interests in Guinea, namely the Société des Bauxites de Dabola-Tougué (SBDT) project (the Leguetera Mine in Dabola). Development plans for the project, which was a joint venture between IMIDRO (51%) and the Government of Guinea (49%), initially included the construction of a 300-kilometer (km) pipeline to transfer slurry to the Port of Conarky in Guinea. Plans in 2020 changed to the construction of a 400-km rail line, the investment cost of which could be shared with other bauxite producers in Guinea, such as Anglo-African Minerals plc of Australia. IMIDRO expected to start bauxite production at the Leguetera Mine by 2025; the mine would have a production capacity of between 4 and 6 million metric tons per year (Mt/yr); the company planned to export the bauxite back to Iran for use in its aluminum industry (table 1; Africa Intelligence, 2020, 2021).

In 2020, aluminum production in Iran increased by 65% to 425,000 metric tons (t) (estimated) and alumina production increased by 1.7% to 238,000 t (estimated). The aluminum and alumina production capacities of Iran were about 827,000 metric tons per year (t/yr) and 280,000 t/yr, respectively. In April 2020, South Aluminum Corp. (SALCO) inaugurated the first phase of an aluminum smelter near Lamerd in Fars Province; this smelter had an aluminum production capacity of 300,000 t/yr, at a cost of \$1.2 billion. Two additional phases, which would increase the smelter's capacity to 1 Mt/yr, were expected to be completed by 2025. Ghadir Investment Co. held a 51% share of SALCO's smelter, and IMIDRO held the remaining 49% share. The Government planned to increase the country's aluminum production to 1.5 Mt/yr by 2026 (tables 1, 2; Onstad, 2018; Economist Intelligence, The, 2020; Tehran Times, 2020b).

**Copper.**—Iran produced 297,100 t of copper concentrate (copper content) in 2020, which was an increase of 0.4% compared with the 295,800 t produced in 2019. NICICO's copper concentrate (copper content) production capacity in 2020 was about 1.2 Mt/yr, mostly accounted for by its three leading mines: Meiduk (located in Kerman Province), Sarcheshmeh (located in Kerman Province), and Sungun (located in East Azerbaijan Province). During the year, NICICO continued to develop the Der Alo copper mine in Kerman Province; the mine was expected to begin production between March 2021 and early 2022 with a capacity of 130,000 t/yr of copper concentrate (copper content). NICICO planned to expand its copper concentrate (copper content) production capacity to 2.3 Mt/yr by 2025. The country's copper reserves were estimated to be 40 Mt by NICICO; the world total reserves of copper were estimated to be 870 Mt at the end of 2020 (tables 1, 2; Financial Tribune, 2020b; Flanagan, 2021; Tehran Times, 2021a).

**Iron and Steel.**—In 2020, iron ore production in Iran increased by 49% to 49.5 Mt from 33.1 Mt in 2019 owing to

the increase in steel production. The volume of iron ore exports, however, decreased by 78% to 2.8 Mt in 2020 from 12.8 Mt in 2019 owing to a 25% export duty on unprocessed raw materials imposed by the Government to promote the production of value-added products. The value of iron ore exports also decreased by 79% to \$271 million (table 1; Iran-daily.com, 2020; Workman, 2021; World Steel Association, 2021, p. 100).

Production of DRI increased by 5.9% to 30.2 Mt in 2020 from 28.5 Mt in 2019. The increase was due partially to the startup of a new DRI plant in Ardakan, Yazd Province, by Ardakan Steel Co.; the new plant had a production capacity of 960,000 t/yr. Midrex Technologies Inc. reported that two new DRI plants were under construction in Iran and were expected to be completed in 2021; these included Makran Steel Co.'s 1.6-Mt/yr DRI plant in Chabahar, Sistan va Baluchestan Province, and Qaenat Steel Co.'s 0.8-Mt/yr DRI plant in Nimbolook, South Khorasan Province (tables 1, 2; Midrex Technologies Inc., 2021, p. 4, 8, 12).

Production of raw steel increased by about 3.4 Mt, or 13%, to 29.0 Mt in 2020, which was a record high for the country. The increase in steel production was due primarily to the startup of multiple new steel plants. According to the Organisation for Economic Co-operation and Development (OECD), five steel plants in Iran started operating in 2020 with a combined production capacity of 2.25 Mt/yr of raw steel. In addition, the OECD reported another three steel plants in Iran with a production capacity of 3.75 Mt/yr of raw steel had been expected to startup in 2020 but were yet to be completed. IMIDRO reported that by the end of 2020 there were 84 steel mills in Iran with a combined production capacity of nearly 40 Mt/yr of steel. IMIDRO also noted that the top four steel producers in Iran in 2020 were MSC, which had a production capacity of 7.2 Mt/yr of raw steel; KSC, 3.8 Mt/yr; ESCO, 3.6 Mt/yr; and South Kaveh Steel Co., 2.4 Mt/yr. The Government's goal was to reach a steel production capacity of 55 Mt/yr by 2025 (tables 1, 2; Financial Tribune, 2020a; Organisation for Economic Co-operation and Development, 2021, p. 37–41).

**Lead and Zinc.**—In 2020, lead (lead content of concentrate) production increased slightly to 52,000 t (estimated); zinc (zinc content of concentrate) production was about 140,000 t (estimated). The two leading zinc and lead mines in Iran were the Mehdiabad Mine, which is located in Yazd Province, and the Angouran Mine, which is located in Zanjan Province. The Mehdiabad Mine had reserves of about 160 Mt at an average grade of 6% zinc and 2% lead. In 2020, IMIDRO and a consortium of five private companies continued to develop a \$1 billion expansion of the Mehdiabad Mine that would increase its production capacity to 800,000 t/yr of zinc concentrate (gross weight) and 80,000 t/yr of lead and silver concentrate (gross weight). The project to expand Mehdiabad had been under development since the 1990s but had faced multiple delays. The Mehdiabad Mine was expected to become the main supplier of zinc and lead in the country after zinc deposits in the Angouran Mine become depleted and would be in operation for about 20 to 25 years (tables 1, 2; MetalsNewsOnline, 2020; Financial Tribune, 2021c).

## ***Industrial Minerals***

**Barite.**—Production of barite in Iran decreased to an estimated 224,000 t in 2020. The decrease in production was due likely to a decrease in demand for drilling material by the domestic crude petroleum and natural gas industries. In 2020, Mehdiabad Zinc Co. was the primary producer of barite in Iran and had a production capacity of 500,000 t/yr; the Mehdiabad Mine is located in Yazd Province in central Iran (tables 1, 2; Mehdiabadmine, [undated]).

**Cement.**—Production of cement increased by more than 13% to an estimated 68 Mt in 2020. The leading cement producer in Iran was Fars and Khouzestan Cement Co., which had a production capacity of about 30 Mt/yr of cement. Other leading cement producers in Iran were Tehran Cement Co., which had a production capacity of 16 Mt/yr of cement; Bank Melli Iran Investment Co. and Ghadir Investments Co., about 10 Mt/yr each; and Espandar Cement Investment Co., about 5 Mt/yr. The total cement production capacity of Iran was estimated to be nearly 90 Mt/yr in 2020. Government officials planned to expand the country's total cement production capacity to 100 Mt/yr by 2021 and to 120 Mt/yr by 2025 (tables 1, 2; Eghtesad Online, 2019; Financial Tribune, 2021a).

**Gypsum.**—Production of gypsum decreased slightly in 2020 to 16 Mt (estimated). The leading Province for gypsum production in Iran was Semnan Province (located in north-central Iran), which was estimated to have a production capacity of more than 17 Mt/yr of gypsum. The country's other leading Provinces for gypsum production were Bushehr Province and Hormozgan Province in southern Iran and Tehran Province in northern Iran; their combined production capacity was estimated to be nearly 6 Mt/yr of gypsum (tables 1, 2; Financial Tribune, 2019b; Jonoub Gypsum Co., [undated]).

## ***Mineral Fuels, Related Materials, and Other Sources of Energy***

The primary energy supply sources of Iran in 2020 were natural gas, which accounted for 70.1% of the country's supply, and crude petroleum and petroleum products, 26.8%. Coal, hydroelectricity, and nuclear energy sources accounted for the remaining 3.1% of the country's energy supply. The country's total electricity generation in 2020 increased by 5.7% to a record high of 337 terawatt-hours compared with 319 terawatt-hours in 2019 (BP p.l.c., 2022, p. 9, 50).

**Coal.**—In 2020, coal production was estimated to be 1.51 Mt. Construction of the Tabas powerplant (a billion-dollar coal-fired plant), which had begun in 2012, continued during the year. The powerplant, which was planned to be completed by 2024, was expected to have two 325-megawatt (MW) units, for a combined capacity of 650 MW. The plant, which is located near Tabas in South Khorasan Province (eastern Iran), was expected to source about 2 Mt of coal annually from the nearby Mazino Mine in the Tabas coal region. The new plant was a partnership between the MAPNA Group and the Shanghai Electric Group Co. Ltd. of China (table 1; Modern Power Systems, 2018; U.S. Energy Information Administration, 2018; Financial Tribune, 2020c; Press TV, 2021).

**Natural Gas.**—Production of natural gas in Iran increased by 3.3% to a record-high amount of 249.6 billion cubic meters in 2020. The South Pars offshore (Persian Gulf) natural gas field accounted for more than 70% of the country's gross natural gas output and held about one-half of the country's total proven natural gas reserves. The field was managed by Pars Oil and Gas Co., which was a subsidiary of NIOC. Overall, 22 of the planned 24 phases (about 90%) of the South Pars project were operating by the end of 2020. Phases 11 and 14 of the South Pars project were expected to start operating by 2022 (tables 1, 2; Eqbali and Saadi, 2021; Islamic Republic News Agency, 2021a; Lepic, 2021; Organization of the Petroleum Exporting Countries, 2022a, p. 79).

In October 2020, Government officials announced that negotiations with companies based in India to develop the offshore Farzad-B natural gas field had broken down. After years of delays to start development of the field, which was discovered in 2002, Government officials said the project would now likely be awarded to an Iran-based company. A disagreement between Government officials and the India-based companies regarding the number of pipelines that would be required for the project, and issues related to United States sanctions on Iran were reasons cited for the cancellation. Natural gas reserves in the Farzad-B Field had been estimated by the Government to be about 650 billion cubic meters. The Farzad-B Field is located in the Farsi Block in the Persian Gulf, 85 km east of Bushehr (Jacob and Manchanda, 2020; Offshore Technology, 2021).

**Petroleum and Petroleum Refinery Products.**—Production of crude petroleum in Iran (including condensates) decreased by 9.0% to 1.13 billion barrels (Gbbl) in 2020 from 1.24 Gbbl (revised) in 2019; this 5-year low in 2020 was a decrease of 36% from the previous high of 1.77 Gbbl (revised) produced in 2017. This decrease in production was due primarily to a continued decrease in exports related to U.S. economic sanctions on Iran and reduced international demand caused by the coronavirus disease 2019 (COVID-19) pandemic (table 1; BP p.l.c., 2021, p. 1, 18; Organization of the Petroleum Exporting Countries, 2022a, p. 46; Lawler and others, 2023).

In July 2020, the Petroleum Engineering and Development Co. (PEDEC) of Iran signed a \$1.3 billion deal with Petropars Group (a subsidiary of NIOC) to complete development of the South Azadegan Field. The contract called for the oilfield's production capacity to more than double to 320,000 barrels per day (bbl/d) of crude petroleum by 2023 from 140,000 bbl/d. Government officials expected that the increase in crude petroleum production would increase Government revenues by as much as \$1 trillion during the life of the field. The South Azadegan Field is located onshore in Khuzestan Province (Kennedy, 2020; Tehran Times, 2020a).

The total crude refinery capacity of Iran was 2.20 Mbbbl/d in 2020. Its refineries produced 1.59 Mbbbl/d, which was a decrease of 7.2% compared with the 1.71 Mbbbl/d produced in 2019. The top three locations with refinery capacity in Iran were Abadan, 0.40 Mbbbl/d; Isfahan, 0.38 Mbbbl/d; and Bandar Abbas, 0.34 Mbbbl/d. In 2019, the Ministry of Petroleum announced that a new production unit at the Isfahan refinery would be built to process mazut (a heavy, low-quality fuel oil) at a cost

of \$670 million; National Iranian Oil Refining and Distribution Co. officials noted in April 2020 that the new unit was expected to be completed in early 2021. The Ministry noted that a similar unit was already operating at the Abadan refinery and that others were being planned at the Bandar Abbas, Tabriz, and Tehran refineries. Iran ranked third among the OPEC member countries for its refinery production capacity; Saudi Arabia ranked first with 2.93 Mbbbl/d of refinery capacity (table 1; Financial Tribune, 2019a; Al Hashem, 2020; Organization of the Petroleum Exporting Countries, 2022a, p. 32–35).

**Uranium.**—Iran produced 71 t of uranium content (estimated) in 2020. The AEOI's uranium-mining operations in Iran that year were at the Gachin Mine (open pit) near Bandar Abbas in Hormozgan Province and the Saghand Mine (underground) in Yazd Province. The Gachin Mine had resources at a grade of 0.068% uranium containing 84 t of uranium. The Bandar Abbas uranium plant produced about 21 t/yr of uranium using the ores from the Gachin Mine through acid leaching, which was then delivered to the Isfahan conversion plant. The Saghand Mine had resources at a grade of 0.0385% uranium containing 500 t of uranium; the associated Ardakan uranium plant, which was still under development, was expected to produce 50 t/yr of uranium from Saghand ore using acid leaching. Uranium-mining operations and processing facilities in Iran were part of its broader nuclear program, which also included nuclear powerplants, nuclear research sites, a research reactor, and uranium enrichment plants (tables 1, 2; World Nuclear Association, 2021).

## MINERAL INDUSTRY HIGHLIGHTS IN 2021

In 2021, Iran ranked third among the world's natural gas producers (after the United States and Russia), accounting for 6.4% of global output. In addition, Iran was the world's eighth-ranked producer of crude petroleum and condensate, accounting for a combined 4.0% of global output. Iran was the world's second-ranked producer of DRI and mined gypsum, accounting for 26.7% and 10.5% (estimated) of global output, respectively; fifth-ranked producer of feldspar, 7.2% (estimated); and eighth-ranked producer of cement, 1.4%. The country ranked seventh among global producers (not including the United States) of barite, accounting for 3.3% of global output; bentonite, 3.7%; kaolin, 3.9%; iron ore (iron content), 2.9%; and molybdenum, 1.2% (table 1; BP p.l.c., 2022, p. 15, 29; Midrex Technologies Inc., 2022, p. 8; Barry, 2023; Crangle, 2023; Hatfield, 2023; McRae, 2023; Polyak, 2023; Simmons, 2023; Tuck, 2023).

## Minerals in the National Economy

The real GDP of Iran increased by 4.0% in 2021; the country's nominal GDP was estimated to be \$1.4 trillion by the IMF. Exports of nonfuel minerals and mineral products were valued at \$10.5 billion in 2020; steel and steel products accounted for \$4.2 billion, or nearly 40% of the total. Other leading minerals and mineral product exports included long steel products valued at \$1.6 billion; copper cathodes, \$1.4 billion; aluminum ingots, \$607 million; flat-rolled steel products, \$494 million; zinc ingots, \$477 million; iron ore and concentrate, \$280 million; and sponge iron, \$238 million. The country's crude petroleum

exports increased by 89% to 0.763 Mbbbl/d; exports to China and other countries in Asia accounted for most of this increase, along with exports to the Middle East and Latin America. Iran exported 17.3 billion cubic meters of natural gas in 2021; Europe and other countries in the Middle East were the leading destinations for these exports (table 1; BP p.l.c., 2022, p. 37; International Monetary Fund, 2022; Organization of the Petroleum Exporting Countries, 2022a, p. 46; Tehran Times, 2023).

Exports of goods from Iran to the United States were valued at \$1.2 million in 2021. The U.S. Census Bureau reported that there were no mineral-related imports from Iran into the United States in 2021. Imports of goods from the United States were valued at \$39.4 million in 2021. Chemicals (fertilizers) valued at \$567,861, nonferrous metals (other) valued at \$12,810, and copper valued at \$4,625 were the only mineral-related imports by Iran from the United States (U.S. Census Bureau, 2022a, b).

## Production

In 2021, significant increases in production included that of magnesium (primary, metal), which increased to 5,000 t from no production in 2020; iron ore (iron content), by 47%; kerosene, by 41%; refined copper (primary, electrowon), by 39%; molybdenum (molybdenum content), by 29%; antimony, by 25%; aluminum, by 18%; crude petroleum, by 17%; refined copper (primary, other), by 15%; and ammonia, smelted copper (primary), and urea, by 11% each. Significant decreases in production included that of manganese (manganese content), by 75%; chromite (chrome content), by 65% (estimated); and smelted copper (secondary), by 10%.

## Commodity Review

Production of cement in Iran decreased by 9% to an estimated 62 Mt in 2021. Government officials noted that the decrease in cement production was due to insufficient electric power. A spokesman for the electricity industry noted that, after having failed to get heavy industrial customers to observe a voluntary cut in electricity demand, electric powerplants were forced to reduce electricity supply to 10% of normal for cement producers during the summer. The country's power grid was under severe stress owing to high temperatures and drought, which caused a spike in consumer demand for air conditioning and a sharp decrease in electricity supply by hydrothermal powerplants (table 1; Global Cement, 2021; Hanna, 2021).

Iran produced an estimated 42,000 kilograms of turquoise in 2021. Although Iran had three mines that produce turquoise, the Neyshabur Mine was the only mine dedicated entirely to the production of turquoise. Considered the oldest turquoise mine in the world, dating back 7,000 years, the Neyshabur Mine had an estimated capacity of 42,000 kilograms per year (kg/yr) of turquoise. The mine is located in Razavi Khorasan Province (near the Turkmenistan border) and was locally owned by residents of Olia and Sofla, the two parts of Ma'adan village. The two other turquoise-producing mines in Iran were the Kuh Zar Mine (Baghu turquoise deposit) and the Meiduk Mine (Shahr-I Babak turquoise deposit). The Kuh Zar Mine, which is located in Semnan Province, primarily produced copper and gold, and the Meiduk Mine, which is located in

Kerman Province, primarily produced copper (tables 1, 2; Islamic Republic News Agency, 2021b; Shirdam and others, 2021, p. 241, 243, 251–253).

The total amount coal produced in Iran increased by 2.5% in 2021 to an estimated 1.55 Mt, consisting of 1.4 Mt (estimated) of metallurgical coal and 0.15 Mt of bituminous coal. In July 2021, the Mazino Mine, which was owned and operated by Fajr Mazinoiy Co., started operations and had a production capacity of 2 Mt/yr of coal. The supply of coal from the open pit mine was expected to be dedicated feedstock for the country's first coal-fired powerplant, the Tabas powerplant (650 MW). The powerplant was expected to be completed in 2024. In November 2021, Government officials announced plans to build an additional 5 gigawatts of coal-fired powerplant capacity. Although no date was provided for the construction of the plants, officials noted the country needed to build the coal-fired powerplants owing to limitations of natural gas supplies to powerplants during the winter, as well as a desire to redirect some domestically consumed natural gas to the export market while taking advantage of and developing the country's domestic coal resources (tables 1, 2; Financial Tribune, 2021d; Press TV, 2021).

Natural gas production in Iran increased by 3.0% to 257 billion cubic meters in 2021, which was a record high amount for the country. In May 2021, NIOC signed a \$1.78 billion contract with Petropars Group to develop the Farzad-B Gasfield. According to the contract, development of the field was expected to be completed within 5 years, and the field would have the capacity to produce about 10 billion cubic meters per year of natural gas (table 1; Hafezi, 2021; MEED, 2021).

In August 2021, Khazar Exploration and Production Co. (KEPCO) announced the discovery of a natural gas deposit in the Chalous Gasfield, which is located offshore near the city of Chalous in Mazandaran Province (150 km north of Tehran in the Caspian Sea). Initial estimates by the company placed the estimated natural gas reserves at about 5 trillion cubic meters; based on these estimates, company officials noted that the natural gas could supply as much as 20% of Europe's annual natural gas demand. Followup studies of the gasfield by the company in November 2021 estimated the natural gas reserves to be more than 7 trillion cubic meters. Ownership of the Chalous Gasfield was shared among Gazprom and Transneft of Russia (40%), China National Petroleum Co. and China National Offshore Oil Co. (28% each), KEPCO (25%), and others (7%) (Iran International, 2021; Khazar Exploration and Production Co., 2021).

Crude petroleum production in Iran increased by 17.1% to 1.32 Gbbl; this was the highest amount produced in the past 3 years, yet it was 25% below the country's record high of 1.77 Gbbl produced in 2017. In May 2021, NIOC announced that it had started preliminary development studies of the newly discovered (in 2019) Namavaran oil reservoir, which is located near the city of Ahvaz in Khuzestan Province (southwestern Iran). The Oil Minister of Iran noted that the Namavaran oil reservoir was the second-largest crude petroleum discovery in the country's history. The reservoir covered 2,400 square kilometers of land, was located nearly 3.1 km beneath the

surface, and had an estimated thickness of 80 meters. NIOC estimated that the in-place crude petroleum reserves in the reservoir were 53 Gbbl and that recoverable crude petroleum reserves in the reservoir were about 5 Gbbl of crude petroleum when considering a 10% recovery factor (table 1; Tehran Times, 2021d).

In July 2021, the Government announced the completion of the Goreh-Jask pipeline. The 1,100-km 42-inch-diameter pipeline, which had been constructed at a cost of \$2 billion, connected oilfields located near Goreh in Khuzestan Province (southwestern Iran) to Jask Port in Hormozgan Province (southeastern Iran). The pipeline's initial capacity was estimated to be 300,000 bbl/d of crude petroleum (about 110 million barrels per year) and was expected to be increased to 1 Mbb/d (about 365 million barrels per year). Government officials noted the primary purpose of the new pipeline was to bypass the Strait of Hormuz, which would ensure continued petroleum exports, decentralize export terminals, and diversify petroleum export centers. The new pipeline could also promote sustainable development and create jobs. Facilities at Jask Port included 20 storage tanks, each capable of storing 500,000 barrels of crude petroleum; this total capacity of 10 million barrels of crude petroleum was expected to be increased to 30 million barrels in the coming years (Tehran Times, 2021c; Watkins, 2021).

## Outlook

The real GDP of Iran is projected to increase at a rate of 3.0% in 2022 and 2.0% in 2023, according to the IMF. The country's economy is expected to be positively affected by rising international demand for crude petroleum and natural gas following the diminished effects of the COVID-19 pandemic. Production of mineral commodities is expected to increase owing to numerous production-capacity expansion projects, especially for metals and mineral fuels that are either currently (2021) in progress or are planned. Noteworthy increases in production are expected from the SALCO aluminum smelter; the Der Alo copper mine; DRI plants operated by Makran Steel Co., Qaenat Steel Co., and PASCO; the Mehdiabad zinc-lead mine; the Farzad-B and South Pars natural gas fields; and multiple cement and steel plants, as well as increases in the production of coal to power the Tabas powerplant. The sustainability of current levels of hydrocarbon output in the country will depend on technological upgrades, development of new fields, and the full lifting of international economic sanctions on Iran to allow increased exports (International Monetary Fund, 2022).

## References Cited

Africa Intelligence, 2020, Tehran flutters its eyelashes at Conakry as it looks for bauxite to reduce its aluminium costs: Africa Intelligence [Paris, France], June 4. (Accessed February 7, 2023, at [https://www.africaintelligence.com/mining-sector\\_politics/2020/06/04/ustra-flutters-its-eyelashes-at-conakry-as-it-looks-for-bauxite-to-reduce-its-aluminium-costs,108408380-eve](https://www.africaintelligence.com/mining-sector_politics/2020/06/04/ustra-flutters-its-eyelashes-at-conakry-as-it-looks-for-bauxite-to-reduce-its-aluminium-costs,108408380-eve).)

Africa Intelligence, 2021, Tehran hopes to capitalise on Doumbouya's isolation: Africa Intelligence [Paris, France], December 6. (Accessed February 2, 2023, at [https://www.africaintelligence.com/mining-sector\\_politics/2021/12/06/ustra-hopes-to-capitalise-on-doumbouya-s-isolation,109709220-ge0](https://www.africaintelligence.com/mining-sector_politics/2021/12/06/ustra-hopes-to-capitalise-on-doumbouya-s-isolation,109709220-ge0).)

Al Hashem, M.A., 2020, Isfahan refinery plans to increase Euro-5 diesel output by 20mn lit: Mehr News Agency [Tehran, Iran], April 27. (Accessed February 1, 2023, at <https://en.mehrnews.com/news/158074/Isfahan-Refinery-plans-to-increase-Euro-5-diesel-output-by-20mn>.)

Australia Trade and Investment Commission, 2021, Export markets—Iran: Canberra ACT, New South Wales, Australia, Australia Trade and Investment Commission. (Accessed December 20, 2021, at <https://www.austrade.gov.au/australian/export/export-markets/countries/iran/industries>.)

Barry, J.J., 2022, Feldspar and nepheline syenite: U.S. Geological Survey Mineral Commodity Summaries 2022, p. 60–61.

Barry, J.J., 2023, Feldspar and nepheline syenite: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 68–69.

BP p.l.c., 2020, Statistical review of world energy 2020, 69th edition: London, United Kingdom, BP p.l.c., June, 65 p. (Accessed February 9, 2023, at <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2020-full-report.pdf>.)

BP p.l.c., 2021, Statistical review of world energy 2021, 70th edition: London, United Kingdom, BP p.l.c., July, 69 p. (Accessed February 9, 2023, at <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2021-full-report.pdf>.)

BP p.l.c., 2022, Statistical review of world energy 2022, 71st edition: London, United Kingdom, BP p.l.c., June, 57 p. (Accessed February 9, 2023, at <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf>.)

Brioche, A.S., 2021, Feldspar and nepheline syenite: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 58–59.

Central Bank of the Islamic Republic of Iran, 2021, Economic trends: Tehran, Iran, Central Bank of the Islamic Republic of Iran, no. 103, Fourth quarter 1399 (2020/2021), September, 28 p. (Accessed December 16, 2021, at <https://www.cbi.ir/simplelist/22228.aspx>.)

Crangle, R.D., Jr., 2022, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2022, p. 76–77.

Crangle, R.D., Jr., 2023, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 84–85.

Economist Intelligence, The, 2020, South Aluminium Corporation smelter finally inaugurated: The Economist Intelligence, April 30. (Accessed February 6, 2023, at [country.eiu.com/article.aspx?articleid=1979475381&Country=Iran&topic=Economy&subtopic=Fore\\_5](https://country.eiu.com/article.aspx?articleid=1979475381&Country=Iran&topic=Economy&subtopic=Fore_5).)

Eghtesad Online, 2019, Growth in cement, clinker output, decline in exports: Eghtesad Online [Tehran, Iran], September 24. (Accessed February 1, 2023, at <https://www.en.eghtesadonline.com/Section-economy-4/30297-growth-in-cement-clinker-output-decline-in-exports>.)

Eghtesad Online, 2020, Mineral products account for 1/5th of Iran's total exports: Eghtesad Online [Tehran, Iran], September 23. (Accessed February 1, 2023, at <https://www.en.eghtesadonline.com/Section-iran-economy-67/33592-mineral-products-account-for-th-of-iran-total-exports>.)

Eqbali, Aresu, and Saadi, Dania, 2021, Iran plans to boost gas output in 2022, including from delayed South Pars: New York, New York, S&P Global, December 21. (Accessed February 9, 2023, at <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/122121-iran-plans-to-boost-gas-output-in-2022-including-from-delayed-south-pars>.)

Financial Tribune, 2019a, Isfahan refinery to build mazut processing unit: Financial Tribune [Tehran, Iran], May 27. (Accessed February 9, 2023, at <https://financialtribune.com/articles/energy/98173/isfahan-refinery-to-build-mazut-processing-unit#>.)

Financial Tribune, 2019b, Semnan gypsum output at 10m tons p.a.: Financial Tribune [Tehran, Iran], December 30. (Accessed February 1, 2023, at <https://financialtribune.com/articles/domestic-economy/101462/semnan-gypsum-output-at-10m-tons-pa>.)

Financial Tribune, 2020a, Iran's annual steelmaking capacity close to 40m tons: Financial Tribune [Tehran, Iran], December 5. (Accessed February 3, 2023, at <https://financialtribune.com/articles/domestic-economy/106419/iran-s-annual-steelmaking-capacity-close-to-40m-tons>.)

Financial Tribune, 2020b, New mine to boost Iran's copper output to 1.3 million tons p.a.: Financial Tribune [Tehran, Iran], August 24. (Accessed February 1, 2023, at <https://financialtribune.com/articles/domestic-economy/104974/new-mine-to-boost-irans-copper-output-to-1-3-million-tons-pa>.)

Financial Tribune, 2020c, Work in progress at 650 MW Tabas coal power plant: Financial Tribune [Tehran, Iran], June 1. (Accessed February 8, 2023, at <https://financialtribune.com/articles/energy/103633/work-in-progress-at-650-mw-tabas-coal-power-plant>.)

Financial Tribune, 2021a, Cement production capacity reaches 88m tons: Financial Tribune [Tehran, Iran], August 14. (Accessed February 6, 2023, at <https://financialtribune.com/articles/domestic-economy/109820/cement-production-capacity-reaches-88m-tons>.)

- Financial Tribune, 2021b, Iran's mineral exports hit \$7.6 billion: Financial Tribune [Tehran, Iran], May 1. (Accessed February 1, 2023, at <https://financialtribune.com/articles/domestic-economy/108439/irans-mineral-exports-hit-76-billion>.)
- Financial Tribune, 2021c, Ministry plans to build Mideast's largest lead, zinc plant in Yazd: Financial Tribune [Tehran, Iran], June 15. (Accessed February 3, 2023, at [https://financialtribune.com/articles/domestic-economy/109039/ministry-plans-to-build-mideast-s-largest-lead-zinc-plant-in-yazd#:~:text=T%20he%20Ministry%20of%20Industries,plant%20in%20the%20Middle%20East](https://financialtribune.com/articles/domestic-economy/109039/ministry-plans-to-build-mideast-s-largest-lead-zinc-plant-in-yazd#:~:text=T%20he%20Ministry%20of%20Industries,plant%20in%20the%20Middle%20East.).)
- Financial Tribune, 2021d, South Khorasan Mine to provide feed for 1st coal-powered plant: Financial Tribune [Tehran, Iran], July 6. (Accessed February 7, 2023, at <https://financialtribune.com/articles/energy/109333/south-khorasan-mine-to-provide-feed-for-1st-coal-powered-plant>.)
- Flanagan, D.M., 2021, Copper: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 52–53.
- Geological Survey and Mineral Exploration of Iran, 2018, Mission and vision: Geological Survey and Mineral Exploration of Iran. (Accessed December 21, 2021, at <https://gsi.ir/en/page/2271/mission-vision>.)
- Global Cement, 2021, Iranian cement producers ordered to stop production for three weeks due to electricity shortage: Global Cement [Surrey, United Kingdom], July 7. (Accessed February 9, 2023, at <https://www.globalcement.com/news/item/12663-iranian-cement-producers-ordered-to-stop-production-for-three-weeks-due-to-electricity-shortage>.)
- Hafezi, Parisa, 2021, Iran's Petropars to develop Farzad B gas field, oil minister says: Thomson Reuters, May 17. (Accessed February 7, 2023, at <https://www.reuters.com/world/middle-east/irans-petropars-develop-farzad-b-gas-field-oil-minister-says-2021-05-17/>.)
- Hanna, Andrew, 2021, Iran suffers twin power and water crises: Washington, DC, U.S. Institute of Peace, August 3. (Accessed February 6, 2023, at <https://iranprimer.usip.org/blog/2021/jul/13/iran-suffers-twin-power-water-crises>.)
- Hatfield, A.K., 2022, Cement: U.S. Geological Survey Mineral Commodity Summaries 2022, p. 44–45.
- Hatfield, A.K., 2023, Cement: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 52–53.
- Hellenic Shipping News, 2021, Iran's steel, mineral exports to China top \$1.2bn in 9 months: Hellenic Shipping News [Lakatamia, Cyprus], August 2. (Accessed February 1, 2023, at <https://www.hellenicshippingnews.com/irans-steel-mineral-exports-to-china-top-1-2bn-in-9-months/>.)
- International Energy Agency, 2020, Petroleum Act of 1987 as amended: Paris, France, International Energy Agency, December 23. (Accessed February 7, 2023, at <https://www.iea.org/policies/12289-petroleum-act-of-1987-as-amended>.)
- International Monetary Fund, 2022, World economic outlook database: Washington, DC, International Monetary Fund, April. (Accessed August 4, 2022, via <https://www.imf.org/en/Publications/WEO/weo-database/2022/April/download-entire-database>.)
- Iran-daily.com, 2020, Iran expecting \$21b revenues from mineral exports: Iran-daily.com [Tehran, Iran], October 2. (Accessed December 23, 2021, at <http://www.irandaily.ir/News/259620.html>.)
- Iran International, 2021, Iran's Caspian Sea gas field, and Russia's share, 'far bigger than expected': Iran International, November 16. (Accessed February 7, 2023, at <https://www.iranintl.com/en/20211116106809>.)
- Iran Ministry of Industry, Mine, and Trade, 2015, Ministry of Industry, Mine, and Trade at a glance: Iran Ministry of Industry, Mine, and Trade, April 25. (Accessed December 11, 2020, at [http://en.mimt.gov.ir/general\\_content/233205-Ministry-of-Industry-Mine-Trade-at-Glance.html?l=General-content](http://en.mimt.gov.ir/general_content/233205-Ministry-of-Industry-Mine-Trade-at-Glance.html?l=General-content).)
- Iran Ministry of Industry, Mine, and Trade, [undated], Law and regulation—Mining Act: Iran Ministry of Industry, Mine, and Trade. (Accessed December 11, 2020, via [https://en.mimt.gov.ir/web\\_directory/258379-Law-regulation.html](https://en.mimt.gov.ir/web_directory/258379-Law-regulation.html).)
- Iran Ministry of Petroleum, 2020, About MOP—Ministry of Petroleum: Iran Ministry of Petroleum. (Accessed January 10, 2022, at <https://en.mop.ir/portal/home/?news/368984/368988/379671/ministry-of-petroleum-mobail>.)
- Iranian Mines and Mining Industries Development and Renovation Organization, [undated], IMIDRO in Iran economy: Iranian Mines and Mining Industries Development and Renovation Organization. (Accessed December 11, 2021, at [http://imidro.gov.ir/general\\_content/398-IMIDRO-IRAN-Economy.html](http://imidro.gov.ir/general_content/398-IMIDRO-IRAN-Economy.html).)
- Islamic Republic News Agency, 2021a, 99% increase in gas extraction from South Pars field: Islamic Republic News Agency, July 20. (Accessed February 9, 2023, at <https://en.irna.ir/news/84410705/99-increase-in-gas-extraction-from-South-Pars-field>.)
- Islamic Republic News Agency, 2021b, Turquoise mine in Neyshabur: Islamic Republic News Agency, April 3. (Accessed February 1, 2023, at [https://en.irna.ir/photo/84282116/Turquoise-Mine-in-Neyshabur#:~:text=Turquoise%20Neyshabur%20Mine%20is%20considered,Neyshabur%2C%20northeastern%20Iran](https://en.irna.ir/photo/84282116/Turquoise-Mine-in-Neyshabur#:~:text=Turquoise%20Neyshabur%20Mine%20is%20considered,Neyshabur%2C%20northeastern%20Iran.).)
- Jacob, Shine, and Manchanda, Megha 2020, After Chabahar Port II, Farzad-B too is set to go out of Indian hands: Business Standard [New Delhi, India], July 15. (Accessed January 31, 2023, at [https://www.business-standard.com/article/current-affairs/after-chabahar-port-farzad-b-too-is-set-to-go-out-of-indian-hands-120071501232\\_1.html](https://www.business-standard.com/article/current-affairs/after-chabahar-port-farzad-b-too-is-set-to-go-out-of-indian-hands-120071501232_1.html).)
- Jonoub Gypsum Co., [undated], About Jonoub Gypsum Co.: Ashkenan, Iran, Jonoub Gypsum Co. (Accessed January 7, 2022, at <https://www.jonoubgypsum.com/about-us/>.)
- Kennedy, Charles, 2020, Iran aims at \$1 trillion oil revenue from giant field development: OilPrice.com, July 20. (Accessed February 7, 2023, at <https://oilprice.com/Latest-Energy-News/World-News/Iran-Aims-At-1-Trillion-Oil-Revenue-From-Giant-Field-Development.html>.)
- Khazar Exploration and Production Co., 2021, New gas hub in Northern Iran: Tehran, Iran, Khazar Exploration and Production Co., August 8. (Accessed February 7, 2023, at <https://www.kepco.ir/en/news/1719/New-Gas-Hub>.)
- Lawler, A., Sharafedin, B., and Aizhu, C., 2023, Iran oil exports end 2022 at a high, despite no nuclear deal: Thomson Reuters, January 15. (Accessed February 9, 2023, at <https://www.reuters.com/business/energy/iranian-oil-exports-end-2022-high-despite-no-nuclear-deal-2023-01-15/>.)
- Lepic, Bojan, 2021, Iran looking for new gas reserves at South Pars: Rigzone, December 6. (Accessed February 8, 2023, at [https://www.rigzone.com/news/iran\\_looking\\_for\\_new\\_gas\\_reserves\\_at\\_south\\_pars-06-dec-2021-167212-article/](https://www.rigzone.com/news/iran_looking_for_new_gas_reserves_at_south_pars-06-dec-2021-167212-article/).)
- McRae, M.E., 2021a, Barite: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 28–29.
- McRae, M.E., 2021b, Fluorspar: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 60–61.
- McRae, M.E., 2022, Barite: U.S. Geological Survey Mineral Commodity Summaries 2022, p. 30–31.
- McRae, M.E., 2023, Barite: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 38–39.
- MEED, 2021, Iran awards \$1.8bn Farzad B gas field contract: Offshore Technology, May 21. (Accessed February 7, 2023, at <https://www.offshore-technology.com/comment/iran-farzad-b-contract/>.)
- Mehdiabadmine, [undated], Barite: Mehdiabadmine. (Accessed December 29, 2021, at <http://mehdiabadmine.com/barite/?lang=en>.)
- MetalsNewsOnline, 2020, Complex manager at Mehdi Abad Mine in an interview with FelezatOnline: MetalsNewsOnline, January 2. (Accessed December 29, 2021, at [http://www.felezatonline.ir/enNews\\_10493\\_%E2%80%9CMehdi-Abad-mine-is-the-manifestation-of-collaboration-between-the-government-and-the-private-sector%E2%80%9D\\_theme/en?id=10493](http://www.felezatonline.ir/enNews_10493_%E2%80%9CMehdi-Abad-mine-is-the-manifestation-of-collaboration-between-the-government-and-the-private-sector%E2%80%9D_theme/en?id=10493).)
- Midrex Technologies Inc., 2021, 2020 world direct reduction statistics: Charlotte, North Carolina, Midrex Technologies Inc., September 14, 15 p. (Accessed February 3, 2023, at [https://www.midrex.com/wp-content/uploads/Midrex-STATSbookprint-2020.Final\\_.pdf](https://www.midrex.com/wp-content/uploads/Midrex-STATSbookprint-2020.Final_.pdf).)
- Midrex Technologies Inc., 2022, 2021 World direct reduction statistics: Charlotte, North Carolina, Midrex Technologies Inc., September, 16 p. (Accessed February 3, 2023, at <https://www.midrex.com/wp-content/uploads/MidrexSTATSBook2021.pdf>.)
- Modern Power Systems, 2018, Coal power: a surprisingly large number of projects in the pipeline: Modern Power Systems, October 17. (Accessed February 9, 2023, at <https://www.modernpowersystems.com/features/featurecoal-power-a-surprisingly-large-number-of-projects-in-the-pipeline-6905457/>.)
- Offshore Technology, 2021, Farzad B gas project, Persian Gulf, Iran: Offshore Technology, August 9. (Accessed February 9, 2023, at <https://www.offshore-technology.com/projects/farzad-b-gas-project-persian-gulf-iran/>.)
- Onstad, Eric, 2018, Iran on track to launch aluminum smelter in 2019, be self-sufficient: Thomson Reuters, April 24. (Accessed February 3, 2023, at <https://www.reuters.com/article/us-aluminium-iran-smelter/iran-on-track-to-launch-aluminum-smelter-in-2019-be-self-sufficient-idUSKBN1HV2BR>.)



- Organisation for Economic Co-operation and Development, 2021, Latest developments in steelmaking capacity: Paris, France, Organisation for Economic Co-operation and Development, September, 66 p. (Accessed January 31, 2023, at <https://www.oecd.org/industry/ind/latest-developments-in-steelmaking-capacity-2021.pdf>.)
- Organization of the Petroleum Exporting Countries, 2022a, Annual statistical bulletin: Vienna, Austria, Organization of the Petroleum Exporting Countries, 90 p. (Accessed August 8, 2022, at <https://asb.opec.org/>.)
- Organization of the Petroleum Exporting Countries, 2022b, Brief history: Vienna, Austria, Organization of the Petroleum Exporting Countries. (Accessed October 26, 2022, at [https://www.opec.org/opec\\_web/en/about\\_us/24.htm](https://www.opec.org/opec_web/en/about_us/24.htm).)
- Polyak, D.E., 2022, Molybdenum: U.S. Geological Survey Mineral Commodity Summaries 2022, p. 112–113.
- Polyak, D.E., 2023, Molybdenum: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 120–121.
- Press TV, 2021, Iran to build 5,000 MW of coal-fired power capacity: Press TV, November 17. (Accessed February 7, 2023, at <https://www.presstv.ir/Detail/2021/11/17/670801/Iran-coal-electricity-power-plant-gas->.)
- Progressive International, 2021, Striking oil workers demand better wages and working conditions in Iran: Progressive International, July 16. (Accessed February 9, 2023, at <https://progressive.international/wire/2021-07-16-striking-oil-workers-demand-better-wages-and-working-conditions-in-iran/en>.)
- Shirdam, B., Shen, A.H., Yang, M., Mokhtari, Z., and Fazliani, H., 2021, Persian turquoise—The ancient treasure of Neyshabur: *Gems & Gemology*, v. 57, no. 3, Fall, p. 240–257. (Accessed February 6, 2023, at <https://www.gia.edu/doc/fall-2021-persian-turquoise-neyshabur.pdf>.)
- Simmons, K.J., 2022, Clays: U.S. Geological Survey Mineral Commodity Summaries 2022, p. 50–51.
- Simmons, K.J., 2023, Clays: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 58–59.
- Tehran Times, 2020a, Domestic firms ink deal to develop South Azadegan oil field: Tehran [Iran] Times, July 20. (Accessed February 6, 2023, at <https://www.tehrantimes.com/news/450239/Domestic-firms-ink-deal-to-develop-South-Azadegan-oil-field>.)
- Tehran Times, 2020b, Iran's aluminum output to rise 100%: Tehran Times, April 24. (Accessed February 1, 2023, at <https://www.tehrantimes.com/news/447116/Iran-s-aluminum-output-to-rise-100>.)
- Tehran Times, 2021a, 1b tons of new copper reserves discovered in Iran: Tehran [Iran] Times, April 6. (Accessed January 31, 2023, at <https://www.tehrantimes.com/news/459524/1b-tons-of-new-copper-reserves-discovered-in-Iran>.)
- Tehran Times, 2021b, Issuance of mining licenses up over 18% in a year: Tehran [Iran] Times, April 18. (Accessed January 31, 2023, at <https://www.tehrantimes.com/news/459963/Issuance-of-mining-licenses-up-over-18-in-a-year>.)
- Tehran Times, 2021c, Jask oil terminal's offshore pipeline completed: Tehran [Iran] Times, August 14. (Accessed February 8, 2023, at <https://www.tehrantimes.com/news/464056/Jask-oil-terminal-s-offshore-pipeline-completed>.)
- Tehran Times, 2021d, NIOC begins development studies on newly discovered reservoir: Tehran [Iran] Times, May 28. (Accessed February 7, 2023, at <https://www.tehrantimes.com/news/461422/NIOC-begins-development-studies-on-newly-discovered-reservoir>.)
- Tehran Times, 2023, Exports from mining sector exceeds \$9b in 9 months: Tehran [Iran] Times, January 22. (Accessed February 1, 2023, at <https://www.tehrantimes.com/news/481117/Exports-from-mining-sector-exceeds-9b-in-9-months>.)
- Tuck, C.C., 2021, Iron ore: U.S. Geological Survey Mineral Commodity Summaries 2021, p. 88–89.
- Tuck, C.C., 2022, Iron ore: U.S. Geological Survey Mineral Commodity Summaries 2022, p. 84–85.
- Tuck, C.C., 2023, Iron ore: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 98–99.
- U.S. Census Bureau, 2022a, Foreign trade-country and product trade data-product detail and partner country-end-use-country by 5-digit end-use code, annual totals, 2012-present-download full exports dataset: U.S. Census Bureau. (Accessed May 23, 2022, via <https://www.census.gov/foreign-trade/statistics/country/index.html>.)
- U.S. Census Bureau, 2022b, Foreign trade-country and product trade data-product detail and partner country-end-use-country by 5-digit end-use code, annual totals, 2012-present-download full imports dataset: U.S. Census Bureau. (Accessed May 23, 2022, via <https://www.census.gov/foreign-trade/statistics/country/index.html>.)
- U.S. Department of State, 2023, Iran sanctions: U.S. Department of State. (Accessed April 28, 2023, at <https://www.state.gov/iran-sanctions/>.)
- U.S. Energy Information Administration, 2018, Today in energy—Countries in and around the Middle East are adding coal-fired power plants: Washington, DC, U.S. Energy Information Administration, May 11. (Accessed February 7, 2023, at <https://www.eia.gov/todayinenergy/detail.php?id=36172>.)
- U.S. Energy Information Administration, 2019, Background reference—Iran: Washington, DC, U.S. Energy Information Administration, January 7, 15 p. (Accessed January 31, 2023, at [https://www.eia.gov/international/content/analysis/countries\\_long/Iran/pdf/iran\\_bkgd.pdf](https://www.eia.gov/international/content/analysis/countries_long/Iran/pdf/iran_bkgd.pdf).)
- Watkins, Simon, 2021, The most important oil project of the year is set to go live: Oilprice.com, July 28. (Accessed February 9, 2023, at <https://oilprice.com/Energy/Crude-Oil/The-Most-Important-Oil-Project-Of-The-Year-Is-Set-To-Go-Live.html>.)
- World Nuclear Association, 2021, Nuclear power in Iran: London, United Kingdom, World Nuclear Association Country Profile, July. (Accessed January 6, 2022, at <https://www.world-nuclear.org/information-library/country-profiles/countries-g-n/iran.aspx>.)
- Workman, Daniel, 2021, Iron ore exports by country: Toronto, Ontario, Canada, *WorldsTopExports*. (Accessed December 23, 2021, at <https://www.worldstopexports.com/iron-ore-exports-country/>.)
- World Steel Association, 2021, Steel statistical yearbook 2021: Brussels, Belgium, World Steel Association, December, 120 p. (Accessed December 23, 2021, at <https://www.worldsteel.org/steel-by-topic/statistics/steel-statistical-yearbook.html>.)

TABLE 1  
IRAN: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2017	2018	2019	2020	2021	
METALS						
Aluminum:						
Bauxite	1,046,634	805,231	1,163,159 <sup>r</sup>	1,200,000 <sup>e</sup>	1,100,000 <sup>e</sup>	
Alumina <sup>e</sup>	240,000	235,000	234,000 <sup>r</sup>	238,000	230,000	
Metal, primary <sup>e</sup>	338,000	305,000 <sup>r</sup>	258,000 <sup>r</sup>	425,000	500,000	
Antimony, mine, Sb content <sup>e</sup>	600 <sup>r</sup>	600	400 <sup>r</sup>	400	500	
Chromium, mine, chromite, concentrate:						
Gross weight	292,209	119,456	122,083	135,049	47,400	
Cr <sub>2</sub> O <sub>3</sub> content <sup>e</sup>	129,000	53,000	54,000	60,000	21,000	
Copper:						
Mine:						
Ore, 0.6% to 1.2% Cu:						
Gross weight <sup>e</sup>	50,500,000	53,000,000	52,000,000	52,500,000	53,000,000	
Cu content	292,400 <sup>r</sup>	311,400 <sup>r</sup>	307,300 <sup>r</sup>	309,200	315,900	
Concentrates, 29% to 35% Cu, Cu content	288,900	300,800	295,800	297,100	316,800	
Solvent extraction <sup>3</sup>	13,200	15,700	16,400	16,400	22,800	
Smelter:						
Primary	114,200	204,100	201,100	223,300	246,800	
Secondary	70,900	100,300	109,100	127,500	114,400	
Refinery:						
Primary:						
Leaching, electrowon	13,200	15,700	16,400	16,400	22,800	
Other	90,000	149,600	160,400	167,500	192,000	
Secondary	57,000	73,300	84,700	95,500	88,700	
Ferroalloys, ferrochromium	metric tons	3,000	13,000	12,000	10,000 <sup>e</sup>	10,000 <sup>e</sup>
Gold, mine, Au content <sup>e</sup>	kilograms	7,000	7,600	8,500 <sup>r</sup>	7,000	7,000
Iron ore, mine:						
Gross weight	thousand metric tons	33,967	36,435	33,093	49,452	72,944
Fe content	do.	22,200	23,900	21,700	32,500	47,900 <sup>e</sup>
Iron and steel:						
Direct-reduced iron	do.	19,401	25,750	28,520	30,211	31,850
Pig iron	do.	2,293	2,362	2,530	2,466	2,690
Raw steel, ingots and castings	do.	21,236	24,520	25,609	28,990	28,500 <sup>e</sup>
Lead: <sup>e</sup>						
Mine, concentrate:						
Gross weight		92,000	92,000	96,000	100,000	96,000
Pb content		48,000	48,000	50,000	52,000	50,000
Refinery:						
Primary		29,000	25,000	25,000 <sup>r</sup>	23,400	24,800
Secondary		103,000	100,000	98,000	97,000	99,200
Magnesium, primary, metal <sup>e</sup>		3,000	1,000	--	--	5,000
Manganese, mine, concentrate: <sup>e</sup>						
Gross weight		101,000	129,000	131,000 <sup>r</sup>	10,000	1,000
Mn content		40,800 <sup>r</sup>	52,100 <sup>r</sup>	52,500 <sup>r</sup>	4,000	1,000
Mercury, Hg content		3	--	--	-- <sup>e</sup>	-- <sup>e</sup>
Molybdenum, mine, concentrate:						
Gross weight <sup>e</sup>		6,400	3,400	1,400	4,800	6,200
Mo content		3,300	1,700	700	2,400	3,100
Zinc: <sup>e</sup>						
Mine, concentrate:						
Gross weight		280,000	280,000 <sup>r</sup>	280,000 <sup>r</sup>	280,000	280,000
Zn content		140,000	140,000	140,000	140,000	140,000
Smelter, primary		140,000	140,000	140,000	140,000	140,000

See footnotes at end of the table.

TABLE 1—Continued  
 IRAN: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2017	2018	2019	2020	2021	
<b>INDUSTRIAL MINERALS</b>						
Arsenic trioxide <sup>c</sup>	400	--	--	--	--	
Barite	239,132	201,721	224,412 <sup>r</sup>	224,000 <sup>e</sup>	224,000 <sup>e</sup>	
Boron, borates	1,150	1,200	2,500 <sup>r,e</sup>	2,500 <sup>e</sup>	2,500 <sup>e</sup>	
Celestite	94,610 <sup>r</sup>	94,200 <sup>r</sup>	129,040 <sup>r</sup>	110,000 <sup>e</sup>	110,000 <sup>e</sup>	
Cement, hydraulic <sup>c</sup>	thousand metric tons	55,200 <sup>r</sup>	55,400 <sup>r</sup>	60,400 <sup>r</sup>	68,300	62,000
Clay: <sup>c</sup>						
Bentonite	518,000	424,000	760,000 <sup>r</sup>	715,000	720,000	
Kaolin	860,000	1,160,000	1,620,000 <sup>r</sup>	1,900,000	1,900,000	
Diatomite <sup>c</sup>	2,660	3,000	-- <sup>r</sup>	--	--	
Feldspar <sup>c</sup>	1,340,000	2,060,000	2,370,000 <sup>r</sup>	1,910,000	2,000,000	
Fluorspar	36,511 <sup>r</sup>	89,102 <sup>r</sup>	49,705 <sup>r</sup>	50,000 <sup>e</sup>	50,000 <sup>e</sup>	
Gemstones, turquoise	kilograms	21,000 <sup>e</sup>	21,000 <sup>e</sup>	21,000 <sup>e</sup>	42,302	42,000 <sup>e</sup>
Gypsum, mine	thousand metric tons	13,476 <sup>r</sup>	13,852 <sup>r</sup>	16,147 <sup>r</sup>	16,000 <sup>e</sup>	16,000 <sup>e</sup>
Iodine	400	368	682	700 <sup>e</sup>	700 <sup>e</sup>	
Lime <sup>c</sup>	thousand metric tons	3,100	3,300	3,450	3,900	3,900
Magnesite	154,860 <sup>r</sup>	169,953 <sup>r</sup>	153,525 <sup>r</sup>	200,000	200,000 <sup>e</sup>	
Mica <sup>c</sup>	4,500 <sup>r</sup>	1,500	1,120 <sup>r</sup>	1,120	1,100	
Nitrogen, N content:						
Ammonia	3,400,000	3,700,000 <sup>e</sup>	3,500,000 <sup>e</sup>	3,600,000 <sup>e</sup>	4,000,000 <sup>e</sup>	
Urea <sup>c</sup>	2,400,000	2,800,000	2,800,000	2,800,000	3,100,000	
Perlite <sup>c</sup>	24,000	72,000	32,000 <sup>r</sup>	32,000	32,000	
Phosphate rock: <sup>c</sup>						
Gross weight	280,000	340,000	327,000 <sup>r</sup>	340,000	340,000	
P <sub>2</sub> O <sub>5</sub> content	89,000	106,000	102,000 <sup>r</sup>	105,000	105,000	
Potash, K <sub>2</sub> O <sub>5</sub> content	thousand metric tons	15	33	37	37 <sup>e</sup>	
Salt	do.	2,800 <sup>e</sup>	2,800 <sup>r,e</sup>	2,700 <sup>r</sup>	3,200 <sup>e</sup>	3,200 <sup>e</sup>
Talc <sup>c</sup>	82,000	49,000 <sup>r</sup>	45,000 <sup>r</sup>	60,000	60,000	
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Coal:						
Bituminous	thousand metric tons	143 <sup>r</sup>	155 <sup>r,e</sup>	142 <sup>r,e</sup>	142 <sup>e</sup>	150 <sup>e</sup>
Metallurgical <sup>c</sup>	do.	1,440 <sup>r</sup>	1,560 <sup>r</sup>	1,370 <sup>r</sup>	1,370	1,400
Coke, metallurgical <sup>c</sup>	do.	1,320 <sup>r</sup>	1,310 <sup>r</sup>	1,160 <sup>r</sup>	1,270	1,300
Natural gas, dry basis <sup>4</sup>	million cubic meters	238,003	233,060 <sup>r</sup>	241,730 <sup>r</sup>	249,630	257,119
Petroleum:						
Crude, including condensate <sup>5</sup>	thousand 42-gallon barrels	1,771,710 <sup>r</sup>	1,681,920 <sup>r</sup>	1,240,635 <sup>r</sup>	1,128,744	1,321,300
Refinery: <sup>4</sup>						
Distillate fuel oil	do.	198,852	201,188	200,750	190,686	199,655
Gasoline, motor	do.	143,701	145,124	148,555	140,178	147,825
Kerosene	do.	43,472	44,640	43,435	24,522	34,675
Residual fuel oil	do.	140,051	141,109	140,525	136,518	140,160
Other	do.	87,053	84,972	88,695	85,278	88,330
Total	do.	613,000	617,000	622,000	577,000	611,000
Uranium, mine, U content <sup>e</sup>		40	71	71	71	71

See footnotes at end of the table.

TABLE 1—Continued  
IRAN: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

---

<sup>6</sup>Estimated. <sup>1</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through January 23, 2023. 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.

<sup>2</sup>In addition to the commodities listed, bromine, caustic soda, clay (unspecified), crude construction materials (such as sand and shell), crushed stone, dimension stone, dolomite, ferrosilicon, hafnium oxide, ilmenite, iron oxide pigments, limestone, methanol, nepheline syenite, pumice, quartzite, selenium, silica, silicomanganese, silver, soda ash, sulfur, zeolites, and zirconium metal may have been produced, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>The copper content of solvent extraction output at the mine level is the same as electrowon refinery output because copper produced in the solvent extraction and electrowinning process is typically reported only at the refinery level.

<sup>4</sup>Source: Organization of the Petroleum Exporting Countries, 2022.

<sup>5</sup>Source: BP, p.l.c., 2022.

TABLE 2  
IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Iran Alumina Co. (IAC) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Plant northeast of Jajarm, North Khorasan Province	280.
Aluminum	Almahdi Aluminium Co. (AAC) [Iranian Mines and Mining Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Bandar Abbas Aluminium Smelter, Hormozgan Province	257.
Do.	Iranian Aluminium Co. (IRALCO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup> , 60%, and a joint venture of Industrial Development Investment Co. and a subsidiary of Mehr Finance & Credit Institution, 40%]	Arak Aluminium Smelter, Markazi Province	230.
Do.	Iran Alumina Co. (IAC) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Jajarm Aluminum Complex, North Khorasan Province	40.
Do.	South Aluminum Corp. (SALCO) [Ghadir Investment Co., 51%, and Iranian Mines and Mining Development and Renovation Organization (IMIDRO), 49%] <sup>1</sup>	Smelter, near city of Lamerd, Fars Province	300.
Antimony	Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) <sup>1</sup>	Sefidabeh Antimony Complex (mine and processing plant) in Sistan va Baluchestan Province	NA.
Do.	Ubar Mining Int'l LLC, 70%, and Part Gowal City Co., 30%	Sirzar Mine, 125 km southwest of Mashhad, Razavi Khorasan Province <sup>2</sup>	NA.
Barite	Iran Barite Group	Ardakan and Haftehr mines in Yazd Province; Chenaroreh Mine in Markazi Province; Hajiabad, Mazandaran, and Tang Dozan mines Isfahan Province, and Verben mine in Qazvin Province	NA.
Do.	Mehdiabad Zinc Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Mehdiabad Mine, 115 km southeast of Yazd City, Yazd Province	500.
Bauxite	Iran Alumina Co. (IAC) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Jajarm Mine, about 15 km northeast of Jajarm, North Khorasan Province	900.
Celestite	Kani Goharan Kimia Co. (KGK)	Mine in Bandar Abbas, Hormozgan Province	72.
Cement	Abadeh Cement Co.	Plant at Abadeh, Fars Province	550.
Do.	Abyek Cement Co. (Fars & Khouzestan Cement Co.)	Plant at Abyek, 80 km northwest of Tehran, Qazvin Province	7,600.
Do.	Anarak Special Cement Co.	Plant at Anarak, Isfahan Province	500.
Do.	Ardebil Cement Co. (Espandar Cement Investment Co.)	Plant at Namin, Ardabil Province	1,220.
Do.	Ardestan Cement Co.	Plant north of Isfahan, Isfahan Province	1,300.
Do.	Asia West Cement Complex Co. (AWCC)	Torbat-e-Jam Plant, Razavi Khorasan Province	1,500.
Do.	Azar-Abadegan Khoy Cement Co.	Plant in West Azerbaijan Province	1,095.
Do.	Behbahan Cement Co. (Fars & Khouzestan Cement Co.)	Plant at Behbahan, Khouzestan Province	800.
Do.	Benvid White Cement Co. (Bank Melli Iran Investment Co.)	Plant at Benvid, Isfahan Province	219.
Do.	Bojnourd Cement Co. (Fars & Khouzestan Cement Co.)	Plant, about 37 km from Bojnourd, North Khorasan Province	1,950.
Do.	Darab Cement Co. [General public (Justice shares), 50%, and Bank Melli Iran Investment Co., 29%]	Plant, about 190 km southeast of Shiraz, Fars Province	1,123.
Do.	Dashtestan Cement Co. (Ghadir Investment Co.)	Plant at Borazjan, Bushehr Province	1,400.
Do.	Doroud Cement Co. (Fars & Khouzestan Cement Co.)	Plant at Doroud, Lorestan Province	1,245.
Do.	East White Cement Co.	NA	330.
Do.	Ekbatan Cement Co. (Espandar Cement Investment Co.)	Plant at Ekbatan, Tehran Province	108.
Do.	Estahban Cement Co.	Plant, 20 km west of Estahban, Fars Province	350.
Do.	Faraz Firouzkhu Cement Co. (Espandar Cement Investment Co.)	Plant, about 180 km northeast of Tehran	1,205.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement—Continued	Fars Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Shiraz, Fars Province	819.
Do.	Farsnov Cement Co. (Fars & Khuzestan Cement Co.)	Plant, about 65 km southeast of Shiraz, Fars Province	1,000.
Do.	Firoz Kuh Co. (Bank Melli Iran Investment Co.)	Plant at Tehran, Tehran Province	1,100.
Do.	Ghaen Cement Co. (Cement Investment and Development Co., 26%; Bank Melli Iran Investment Co., 14%; others, 60%)	Plant at Qayen (Ghaen), South Khorasan Province	811.
Do.	Gharb Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Kermanshah, Kermanshah Province	1,248.
Do.	Gilan Sabz Cement Co. (Tehran Cement Co.)	Plant at Deylaman, Gilan Province	1,200.
Do.	Hegmatan Cement Co. (Tehran Cement Co., 79%)	Plant east of Razan, Hamadan Province	2,400.
Do.	Hormozgan Cement Co. (Omid Investment Management Corp.)	Plant, about 75 km west of Bandar Abbas, Hormozgan Province	1,872.
Do.	Ilam Cement Co. (Tehran Cement Co., 50%; Omid Investment Management Corp., 47%; other private, 3%)	Plant northeast of Ilam, Ilam Province	1,750.
Do.	Isfahan Cement Co.	Plant at Isfahan, Isfahan Province	1,168.
Do.	Jovein Cement Co.	Plant in Razavi Khorasan Province	1,400.
Do.	Karoun Cement Co.	Plant near Masjed Soleyman, Khuzestan Province	1,100.
Do.	Kavan Boukan Cement Co.	Plant at Bukan, West Azerbaijan Province	1,250.
Do.	Kavir Kashan Cement Co. (Espandar Cement Investment Co.)	Plant near Kashan, Isfahan Province	690.
Do.	Kerman Cement Co. (Bank Melli Iran Investment Co., 38%)	Plant at Kerman, Kerman Province	1,314.
Do.	Khamseh Cement Co.	Plant in Zanjan Province	1,061.
Do.	Khash Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Khash, Sistan va Baluchestan Province	811.
Do.	Khazar Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Loshan, Gilan Province	1,250.
Do.	Khuzestan Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Ramhormoz, Khuzestan Province	2,500.
Do.	Kiasar Cement Co. (Espandar Cement Investment Co.)	Plant in Mazandaran Province	690.
Do.	Kordestan Cement Co. (Ghadir Investment Co.)	Plant north of Bijar, Kurdistan Province	1,500.
Do.	Lamerd Cement Co.	Plant at Lamerd, Fars Province	1,250.
Do.	Lar-e Sabzevar Cement Co.	Plant at Sabzevar, Razavi Khorasan Province	1,030.
Do.	Larestan Cement Co.	Plant in Fars Province	1,100.
Do.	Loshan Cement Co. (Tehran Cement Co., 66%)	Plant at Loshan, Gilan Province	200.
Do.	Margon Cement Co.	Plants in Kohgiluyeh va Boyer, Ahmad Province	1,000.
Do.	Mazandaran Cement Co. (Bank Melli Iran Investment Co., 60%)	Plant at Neka, Mazandaran Province	2,270.
Do.	Mehriz Tejarat Cement Co.	Plant, 55 km southeast of Mehriz, Yazd Province	1,460.
Do.	Momtazan Cement Co.	Plant at Kerman, Kerman Province	1,030.
Do.	Monde Dashti Cement Co. (Ghadir Investment Co.)	Plant in Bushehr Province	1,200.
Do.	Naeen Cement Co. (Tehran Cement Co.)	Plant in Isfahan Province	1,650.
Do.	Nahavand Cement Co. (Tehran Cement Co.)	Plant in Hamadan Province	1,205.
Do.	Neyriz White Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Neyriz, Fars Province	164.
Do.	Neyzar Qom Cement Co. (Espandar Cement Investment Co.)	Plant in Qom Province	1,150.
Do.	Omran Anarak Cement Co.	Plant at Delijan, Markazi Province	1,100.
Do.	Peyvand Golestan Cement Co. (Tehran Cement Co.)	Plant near Galikesh, Golestan Province	1,241.
Do.	Qeshm Cement Co.	Plant at Qeshm Island, Hormozgan Province	510.
Do.	Safaeh Cement Co.	Plant at Safaeh, Yazd Province	624.
Do.	Saman Gharb Cement Co.	Plant at Mahi Dasht, Kermanshah Province	2,300.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement—Continued	Sarooj Bushehr International Co. (Bank Melli Iran Investment Co.)	Plant at Kangan, Bushehr Province	1,650.
Do.	Sarooj Isfahan Cement Co.	Plant in Isfahan Province	600.
Do.	Saveh Grey Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Saveh, Markazi Province	2,738.
Do.	Saveh White Cement Co. (Fars & Khuzestan Cement Co.)	do.	365.
Do.	Sepahan Cement Co. (Ghadir Investment Co.)	Plant at Mobarakeh, Isfahan Province	3,200.
Do.	Shahrekord Cement Co.	Plant at Sefiddasht, Chahar Mahal va Bakhtiari Province	1,030.
Do.	Shahroud Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Shahroud, Semnan Province	1,872.
Do.	Shargh Cement Co. (Ghadir Investment Co.)	Plant at Mashhad, Razavi Khorasan Province	2,500.
Do.	Shomal Cement Co. (Bank Melli Iran Investment Co., 59%)	Plant at Pardis, Tehran Province	1,550.
Do.	Shomal White Cement Co. (Bank Melli Iran Investment Co., 59%)	do.	89.
Do.	Soufian Cement Co. (Fars & Khuzestan Cement Co., 50%, and Social Security Organization Investment Co., 50%)	Plant, about 33 km northwest of Tabriz, East Azerbaijan Province	2,555.
Do.	Tehran Cement Co.	Plant at Tehran, Tehran Province	5,400.
Do.	Tis Chabahar Cement Co.	Plant at Rask, Sistan va Baluchestan Province	1,000.
Do.	Urmia Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Orumiyeh, West Azerbaijan Province	2,100.
Do.	Urmia White Cement Co.	do.	180.
Do.	Yasuj Cement Co. (Fars & Khuzestan Cement Co.)	Plants in Kohgiluyeh va Boyer, Ahmad Province	230.
Do.	Yazd Bohrouk Cement Co.	Plant at Yazd, Yazd Province	1,100.
Do.	Zabol Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Zahedan, Sistan va Balochestan Province	1,030.
Do.	Zanjan Cement Co. (Fars & Khuzestan Cement Co.)	Plant at Zanjan, Zanjan Province	660.
Do.	Zarrin Rafsanjan Cement Co.	Plant in Kerman Province	230.
Do.	Zaveh Torbat Cement Co.	Plant at Torbat e-Heydariyeh, Razavi Khorasan Province	1,092.
Chromite, concentrate, Cr <sub>2</sub> O <sub>3</sub> content	Esfandaghe Mines Co.	Abdasht Mine, Kerman Province; Suqan (Saboughan) Mine, Kerman Province; Processing plant at Esfandaghe, Kerman Province	30.
Do.	Faryab Mining Co.	Faryab Mine and processing plant, Minab, Hormozgan Province	180. <sup>c</sup>
Do.	Kani Goharan Kimia Co. (KGK)	Mine in Kerman Province	12.
Do.	Shahab Sang Co.	Sabzan Mine, Faryab, Kerman Province	5.
Do.	NA	Furumad Mine, Shahroud, Semnan Province; Gaft processing plant, Semnan Province	6.
Do.	NA	Mir Mahmud Mine, Mayami, Semnan Province	6.
Do.	NA	Dumak Mine, Zahedan, Sistan va Baluchestan Province	2.
Coal	Central Alborz Coal Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Mine in Mazandaran Province	120.
Do.	Fajr Mazinoiy Co.	Mazino Mine, Tabas, South Khorasan Province	2,000.
Do.	Iran Minerals Production and Supply Co. (IMPASCO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Eastern Parvadeh Mine, Tabas, South Khorasan Province	600.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Coal—Continued	Iran Minerals Production and Supply Co. (IMPASCO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Parvadeh 4 Mine, South Khorasan Province	600.
Do.	do.	Parvadeh 2 and 3 Mines, Tabas, South Khorasan Province	500.
Do.	do.	Khomroud Mine, Ravar, Kerman Province	450.
Do.	do.	Kordobad Mine, Mazadaran Province	325.
Do.	do.	Hashouni and Pabdana Mines, Kerman Province	150.
Do.	do.	Takht and Vatan Mines, Alborz Province	150.
Do.	do.	Zemestanyurt Mine, near Azadshahr, Golestan Province	100.
Do.	Kerman Coal Co.	Eshkli Mine and Hamkar Mine, Kerman Province	620.
Do.	The Middle East Mines and Minerals Industries Development Holding Co. (MIDHCO)	Zarand Mine, Zarand, Kerman Province	1,200.
Coke	Esfahan Steel Co. (ESCO) [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Plant about 40 km southwest of Isfahan, Isfahan Province	900.
Do.	Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) <sup>1</sup>	Plant at Savadkouh, Mazandaran Province	300.
Do.	Middle East Coke Production Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Plant at Zanjan, Zanjan Province	800.
Do.	Tabas Coke Production Co. [Iranian Mines and Mining Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Plant near Tehran, Tehran Province	450.
Do.	Zarand Iranian Steel Co. (ZISCO) [The Middle East Mines and Minerals Industries Development Holding Co. (MIDHCO)]	Plant at Zarand, Kerman Province	800.
<b>Copper:</b>			
Concentrate, Cu content	Faraz Ma'aden Anarak Co.	Maskani Mine, Naeen, Isfahan Province	55.
Do.	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	720.
Do.	do.	Sungun Mine and plant, East Azerbaijan Province	325.
Do.	do.	Meiduk Mine, 40 km northeast of Shahr-e Babak, Kerman Province	150.
Do.	do.	Qal'eh Zari Mine, about 120 km southwest of Birjand, South Khorasan Province	10.
Do.	do.	Chah Firozeh, Chah Messi, Darehzar, and Eijo copper mines, Kerman Province	NA.
Do.	Private cooperatives	Chah Musa Mine and Qal'eh Sukhteh Mine, Semnan Province	5.
Do.	Small scale miners	Kuh Zar Mine, Semnan Province	NA.
Smelter output	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Smelter, Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	200.
Do.	do.	Smelter near Khatoonabad, Kerman Province	450.
Do.	do.	do.	120.

See footnotes at end of table.



TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Copper:—Continued</b>				
Refined metal		National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Refinery, Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	210.
Do.		do.	Refinery, Sungun copper complex in East Azarbaijan Province	100.
Do.		do.	Electrowinning plant, Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	14.
Do.		do.	Electrowinning plant, Meiduk copper complex, Kerman Province	5.
Do.		The Middle East Mines and Minerals Industries Development Holding Co. (MIDHCO)	Refinery, 20 km north of Shahr-e Babak, Kerman Province	50.
<b>Ferroalloys:</b>				
Ferrochrome		Iran Minerals Production and Supply Co. (IMPASCO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Joghatai ferrochrome complex, Razavi Khorasan Province	25.
Do.		Top Echo Co.	Plant at Rafsanjan, Kerman Province	60.
Ferrosilicon		The Middle East Mines and Minerals Industries Development Holding Co. (MIDHCO)	Plant at Malayer, Glass Industrial Estate, Hamedan Province	12.
Do.		do.	Plant at Joka Industrial Town, Joka City, Hamedan Province	12.
Fluorspar		Kani Goharan Kimia Co. (KGK)	Mine in Bandar Abbas, Hormozgan Province	10.
Gemstones, turquoise	kilograms	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Meiduk Mine, 40 km northeast of Shahr-e Babak, Kerman Province	36,000. <sup>e</sup>
Do.	do.	Small scale miners of Olia and Sofla	Neyshabur Mine, Razavi Khorasan Province	42,000. <sup>e</sup>
Do.		NA	Kuh Zar Mine, Semnan Province	NA.
<b>Gold:</b>				
Ore, Au content	kilograms	Artisanal placer operations	Neyshabur area, Razavi Khorasan Province	NA.
Do.	do.	Iran Minerals Production and Supply Co. (IMPASCO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Mouteh Mine (Chah Khaton and Senjedeh pits), Isfahan Province, and Kuh-e-Zar Mine, Semnan Province	600.
Do.	do.	do.	Kouhdom Mine, 110 km northeast of Ardestan, Isfahan Province	100.
Do.	do.	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Combined production from various copper mines	600.
Do.	do.	Zar Kuh Mining Co.	Sari Gunay Mine, 90 km east of Sanandaj, Kurdistan Province	2,000.
Do.	do.	Zarshouran Gold Mine and Mining Industries Development Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Zarshouran Mine, 31 km northeast of Takab, West Azerbaijan Province	3,000.
Metal	do.	do.	Zarshouran complex, near Takab, West Azerbaijan Province	NA.
Gypsum		Afra Gypsum Hormoz Co.	Quarry at Bandar Abbas, Hormozgan Province	360.
Do.		IR Gypsum Co.	Quarry in Semnan Province	10,950.
Do.		Jazeera Gypsum Mining Co.	Quarry and plant near Bushehr City, Bushehr Province	200.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gypsum—Continued	Jonoub Gypsum Co.	Quarry in Bandar Khamir, Hormozgan Province	1,200.
Do.	Kani Goharan Kimia Co. (KGK)	Quarry in Hormozgan Province	1,440.
Do.	Khak Sang Kish Co.	Quarry at Khamir, Hormozgan Province	360.
Do.	Khamir Gypsum Co.	Quarry in Hormozgan Province	1,200.
Do.	Khorasan Gypsum Co.	Quarry in Semnan Province	1,000.
Do.	Mazandaran Semnan Gypsum Co.	do.	1,095.
Do.	Omid Semnan Gypsum Co.	Quarry in Tehran Province	365.
Do.	Samim Derakhshan Co.	Quarry at Bandar Khamir, Hormozgan Province	1,200.
Do.	Semnan Gypsum Co.	Quarry in Semnan Province	1,825.
Do.	Ziari Holding Co. (Pardisun Gypsum Co., Sahar Gypsum Co. and Simin Gypsum Semnan Co.)	do.	2,190.
Iron and steel:			
Iron ore, Fe content	Ario Iron Ore Mining Group	Ghadir, Kosar, Meshkat, Noor and Farsineh Mines, Yazd Province	2,500.
Do.	Chadormalu Mining and Industrial Co. [Omid Investment Management Corp., 37.6%; Mines and Metals Development Investment Co., 16.4%; Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), <sup>1</sup> 10.4%]	Chadormalu Mine, 80 km north of Bafq, Yazd Province	16,000.
Do.	Gol-e-Gohar Iron Ore Co. [Omid Investment Management Corp., 39%; Mines and Metals Development Investment Co., 28%; Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), <sup>1</sup> 18%]	Gol-e-Gohar Mine, about 50 km southwest of Sirjan, Kerman Province	14,000.
Do.	Iran Central Iron Ore Co. [National Iranian Steel Co. (NISCO), 100%] <sup>2</sup>	Choghart Mine, Bafq, Yazd Province	3,250.
Do.	Iranian Minerals Production and Supply Co. (IMPASCO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) <sup>1</sup> ]	Jalal Abad Mine, about 40 km northwest of Zarand, Kerman Province	2,000.
Do.	do.	Chah Gaz Mine, Yazd Province	700.
Do.	do.	Mishdovan Mine, Yazd Province	500.
Do.	Sangan Iron Ore Co. [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Sangan (Songun) Mine, about 140 km southeast of Torbat e-Heydariyeh, Razavi Khorasan Province	2,600.
Do.	Small privately owned mines (about 20)	NA	1,000. <sup>c</sup>
Cast iron	Zagros Steel Co. (Government, majority interest)	Foundry in Kurdistan Province	70.
Direct-reduced iron	Ardakan Steel Co. (ARSCO)	Direct-reduction iron plant in Ardakan, Yazd Province	960.
Do.	Arfa Steel Co. [ChadorMalu Mining & Industrial Co., 43.69%; Mines and Metals Development Investment Co. (MMDIC), 20.51%; Yaran Rolling Pipe Co., 16.99%; others, 19.81%]	do.	800.
Do.	Baft Steel Co. [Iranian Mines and Mining Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Direct-reduction iron plant, Baft, Kerman Province	800.
Do.	Chadormalu Mining and Industrial Co. [Omid Investment Management Corp., 37%; Mines and Metals Development Investment Co., 15%; Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), <sup>1</sup> 8%]	Direct-reduction iron plant, Ardakan, Yazd Province	1,550.
Do.	Esfahan Steel Co. (ESCO) [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Direct-reduction iron plant about 40 km southwest of Esfahan, Esfahan Province	600.
Do.	Gol-e-Gohar Mining and Industrial Co.	Direct-reduction iron plant, Kerman Province	3,260.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel:—Continued			
Direct-reduced iron— Continued	Hormozgan Steel Co. (HOSCO) [National Iranian Steel Co. (NISCO) <sup>3</sup> and partners]	Direct-reduction iron plant, Gachin, Hormozgan Province	1,660.
Do.	Iranian Ghadir Iron and Steel Co. (IGISCO)	Direct-reduction iron plant in Ardakan Yazd Province	800.
Do.	Khorasan Steel Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) <sup>1</sup> , majority interest, and a Government pension fund, 40%]	Direct-reduction iron plant, Razavi Khorasan Province	1,600.
Do.	Khouzestan Steel Co. (KSC) [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Direct-reduction iron plant, Ahwaz, Khouzestan Province	3,820.
Do.	Mianeh Steel Co.	Direct-reduction iron plant, Mianeh, East Azarbaijan Province	800.
Do.	Mobarakeh Steel Co. (MSC) [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Direct-reduction iron plant about 50 km southwest of Isfahan, Isfahan Province	8,990.
Do.	Neyriz Ghadir Steel Co. [Ghadir Investment Co. (IGISCO), 65%]	Direct-reduction iron plant in Neyriz, Fars Province	800.
Do.	Pasargad Steel Co. (PASCO) (private, 100%)	Direct-reduction iron plant in Shiraz, Fars Province	1,500.
Do.	Persian Gulf Saba Steel Co.	Direct-reduction iron plant in Bandar Abbas, Hormozgan Province	1,500.
Do.	Sabzevar Pars Steel Co. (SPSCO)	Direct-reduction iron plants in Razavi Khorasan Province	800.
Do.	Sefid Dasht Steel Co.	Direct-reduction iron plant in Chahar Mahal va Bakhtiari Province	800.
Do.	Shadegan Steel Co.	Direct-reduction iron plants in Shadegan, Khouzestan Province	800.
Do.	Sirjan Iranian Co. (SISCO)	Direct-reduction iron plant in Kerman Province	1,700.
Do.	Sirjan Jahan Steel Complex Co. (SJSCO) (Golgohar Mining & Industrial, 51%)	Direct-reduction iron plants in Sirjan, Kerman Province	960.
Do.	South Kaveh Steel Co.	Direct-reduction iron plant in Bandar Abbas, Hormozgan Province	1,860.
Steel, raw	Arfa Steel Co. [ChadorMalu Mining & Industrial Co., 43.69%; Mines and Metals Development Investment Co. (MMDIC), 20.51%; Yaran Rolling Pipe Co., 16.99%; others, 19.81%]	Plant at Ardakan, Yazd Province	800.
Do.	Bardsir Steel Co. [The Middle East Mines and Minerals Industries Development Holding Co. (MIDHCO)]	Bardsir steel plant, 60 km west of Kerman, Kerman Province	1,000.
Do.	Chadormalu Mining and Industrial Co. [Omid Investment Management Corp., 37%; Mines and Metals Development Investment Co., 15%; Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), <sup>1</sup> 8%]	Plant at Ardakan, Yazd Province	1,000.
Do.	Esfahan Steel Co. (ESCO) [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Plant, about 40 km southwest of Isfahan, Isfahan Province	3,600.
Do.	Hormozgan Steel Co. (HOSCO) [National Iranian Steel Co. (NISCO) <sup>3</sup> and partners]	Plant in Gachin, Hormozgan Province near Bandar Abbas, Hormozgan Province	1,500.
Do.	Khorasan Steel Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), <sup>1</sup> 60%, and a Government pension fund, 40%]	Plant at Neyshabur, Razavi Khorasan Province	650.
Do.	Khouzestan Steel Co. (KSC) [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Plant at Ahwaz, Khouzestan Province	3,800.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Iron and steel:—Continued</b>			
Steel, raw—Continued	Meibod (Meybod) Steel Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), <sup>1</sup> 50%]	Plant, about 15 km southwest of Meybod, Yazd Province	300.
Do.	Mobarakeh Steel Co. (MSC) [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Plant, about 50 km southwest of Isfahan, Isfahan Province	7,200.
Do.	Saba Steel Co. [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Plant in Isfahan Province	1,600.
Do.	Sepid Dasht Steel Co. [National Iranian Steel Co. (NISCO)] <sup>3</sup>	Plant in Lorestan Province	1,000.
Do.	South Kaveh Steel Co. (SKS)	Plant near Bandar Abbas, Hormozgan Province	2,400.
Do.	Vian Steel Melting and Casting Co.	Plant, about 42 km from Hamadan, Hamadan Province	600.
<b>Lead:</b>			
Concentrate, Pb content	Calcimin Co. [Iran Zinc Mines Development Co. (IZMDC)]	Dandi zinc and lead concentrator plant, Zanjan Province	30.
Do.	Zanjan Zinc Kholes Sazan Industrial Group	Zanjan plant, Zanjan Province	20.
Refined metal, primary	National Iranian Lead and Zinc Co. (Iran Zinc Mines Development Co.)	Refinery about 12 km east of Zanjan, Zanjan Province	40.
Refined metal, secondary	NIRU Manufacturing Co. Ltd.	Plants in Tehran, Tehran Province	65.
Lead and zinc, ore	Bafq Mining Co.	Koushk Mine, Yazd Province	120.
Do.	BAMA Co.	Irakouh complex (Gooshfil underground and Tappeh Sorkh open pit mines, about 20 km southeast of Isfahan, Isfahan Province, and Kolah Darvazeh Mine, south of Isfahan, Isfahan Province)	100.
Do.	Beroner Tehran Co. (Kahanroba Industrial Group, 100%)	Emarat Mine, about 25 km southwest of Arak, Markazi Province	150.
Do.	Iran Minerals Production and Supply Co. (IMPASCO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Nakhlak lead and zinc plant, 55 km northeast of Anarak, Isfahan Province	50.
Do.	Mehdiabad Zinc Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Mehdiabad Mine, 115 km southeast of Yazd City, Yazd Province	700.
Do.	Zangan Zinc Industry LLP [Iran Zinc Mines Development Co. (IZMDC)]	Angouran open pit mine, Dandi, Zanjan Province	1,000.
Lime	Espandar Lime Complex Co.	Azarshahr plant in Tabriz, East Azerbaijan Province	131.
Do.	do.	Alborz plant in Firoozkooh, Tehran Province	55.
Do.	Pasargad Steel Co. (PASCO) (private, 100%)	Lime plant in Shiraz, Fars Providence	70.
Do.	Shargh Industrial Lime Co.	Plant in Mashhad, Razavi Khorasan Province	NA.
Do.	The Middle East Mines and Minerals Industries Development Holding Co. (MIDHCO)	Plant, 30 km northwest of city of Kerman, Kerman Province	400.
Do.	Zangan Zinc Industry LLP [Iran Zinc Mines Development Co. (IZMDC)]	Angouran open pit mine, Dandi, Zanjan Province	40.
Magnesite	Birjand Refractory Mining Co. [Iranian Refractories Procurement & Production Co. (IRPPC)]	Hoz Sefid, Shirkuhak, and Torshak Mohammadi Mines, about 50 km southeast of Birjand, South Khorasan Province	100.
Do.	Kani Goharan Kimia Co. (KGK)	Mine in Bandar Abbas, Hormozgan Province	60.
Do.	Nokabad Magnesite Co.	Nokabad Mine, Sistan va Baluchestan Province	30.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Magnesite—Continued		Persia Payan Madan Co.	Chasiah and Soltan Abad Mines, Tehran Province	50.
Magnesium		Royal Metal Ingot Co.	Plant in South Khorasan Province	6.
Methanol		Kaveh Methanol Co.	Plant in Dayyer, Bushehr Province	2,555.
Do.		Middle East Kimia Pars Petrochemical Co.	Petrochemical complex, Asaluyeh, Bushehr Province	1,445.
Molybdenum, concentrate		National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Molybdenum plant, Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	8.
Do.		do.	Molybdenum plant, Sungun copper complex, East Azerbaijan Province	3.
Natural gas	billion cubic meters	National Iranian Oil Co. (NIOC) <sup>1</sup>	Associated gas from company oilfields, onshore	96.
Do.	do.	do.	Aghar, Dalan, and Kangan gasfields, Fars Province, and Nar gasfield, Bushehr Province, onshore	57.
Do.	do.	Pars Oil and Gas Co. [National Iranian Oil Co. (NIOC), 100%] <sup>1</sup>	South Pars gasfield, offshore	227.
Natural gas liquids	thousand 42-gallon barrels	National Iranian Oil Co. (NIOC) <sup>1</sup>	Refinery at Bandar Abbas, Hormozgan Province	131,400.
Nitrogen fertilizer		Lordegan Petrochemical Co. (Iranian Petrochemical Investment Group, 77.77%)	Plant in Chahar Mahal va Bakhtiari Province	677 ammonia, NA urea.
Do.		National Petroleum Co. (NPC)	Plant in Bandar Mahshahr, Bandar Mahshahr-Bandar Emam Road, Khuzestan Province	NA ammonia, 6,700 urea.
Do.		Pardis Petrochemical Co.	Plant in Asaluyeh, Bushehr Province	2,000 ammonia, 3,200 urea.
<b>Petroleum:</b>				
Crude	million 42-gallon barrels	National Iranian Oil Co. (NIOC) <sup>1</sup>	Onshore oilfields include the Agha Jari, the Ahwaz-Asmari, the Bangestan, the Hakimeh, the Gachsaran, the Karanj, the Marun, the Pazanan, and the Rag-e-Safid. Offshore oilfields include the Abouzar and the Salman	1,400.
Do.	do.	National Iranian Oil Co. (NIOC) <sup>1</sup> and buyback contract joint venture of Shell Iran Nowrooz/Soroosh Development (70%), JJI S&N B.V. (20%), and Iranian Offshore Engineering & Construction Co. (10%)	Nowrooz and Soroosh fields, offshore	75.
Do.	do.	National Iranian Oil Co. (NIOC) <sup>1</sup> and buyback contract joint venture of Total S.A. (55%) and Eni SpA (45%)	Doroud field, offshore	65.
Do.	do.	National Iranian Oil Co. (NIOC) <sup>1</sup>	South Azadegan field, Khuzestan Province	52.
Do.	do.	National Iranian Oil Co. (NIOC) <sup>1</sup> and buyback contract joint venture of Total S.A. (70%) and PETRONAS Carigali International Sdn Bhd (30%)	Sirri A and E fields, offshore	40.
Do.	do.	National Iranian Oil Co. (NIOC) <sup>1</sup> and China National Petroleum Co. (CNPC)	North Azadegan field, Khuzestan Province	27.
Do.	do.	National Iranian Oil Co. (NIOC) <sup>1</sup> and buyback contract joint venture of Total S.A. (60%) and Naftiran Intertrade Co. (40%)	Darquain field, Khuzestan Province	17.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Petroleum:—Continued</b>				
Refined products	thousand 42-gallon barrels per day	National Iranian Oil Refining and Distribution Co. (NIORDC) <sup>1</sup>	Refinery at Abadan, Khuzestan Province	400.
Do.	do.	do.	Refinery at Isfahan, Isfahan Province	375.
Do.	do.	do.	Refinery at Bandar Abbas, Hormozgan Province	344.
Do.	do.	do.	Refinery at Tehran, Tehran Province	250.
Do.	do.	do.	Refinery at Arak, Markazi Province	250.
Do.	do.	do.	Refinery at Borzuyeh, Tehran Province	120.
Do.	do.	do.	Refinery at Tabriz, East Azerbaijan Province	110.
Do.	do.	do.	Refinery at Shiraz, Fars Province	60.
Do.	do.	do.	Refinery at Lavan, on Lavan Island, Hormozgan Province	60.
Do.	do.	do.	Refinery at BooAli Sina, Khuzestan Province	34.
Do.	do.	do.	Refinery at Kermanshah, Kermanshah Province	22.
Do.	do.	do.	Refinery at Aras 2, East Azerbaijan Province	10.
Do.	do.	do.	Refinery at Bushehr, Bushehr Province	10.
Do.	do.	do.	Refinery at Aras 1, East Azerbaijan Province	5.
Do.	do.	do.	Refinery at Yazd, Yazd Province	3.
Do.	do.	do.	Refinery at Zarand, Kerman Province	1.
Phosphate rock		Esfordi Phosphate Complex Co. [Iran Minerals Production and Supply Co. (IMPASCO)] <sup>1</sup>	Mine, about 35 km northeast of Bafq, Yazd Province	360.
Potash		Iran Potash Co. [Iran Minerals Production & Supply Co. (IMPASCO)] <sup>1</sup>	Zanjan and Biabanak Mines, near Khur, Isfahan Province	50.
Silver	kilograms	Zarshouran Gold Mine and Mining Industries Development Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Zarshouran Mine, 40 km northeast of Takab, West Azerbaijan Province	2,500.
<b>Stone:</b>				
Limestone		Gohar Khak Bushehr Co.	Quarry in Bushehr Province	730.
Do.		IMPASCO [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Pirbakran limestone complex, Isfahan Province	2,000.
Do.		Iran Alumina Co. (IAC) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Jajarm Mine, about 15 km northeast of Jajarm, North Khorasan Province	NA.
Do.		Morvarid Bandar Pol (MBP)	Quarry at Bandar Abbas, Hormozgan Province	NA.
Limestone and Marble		Farzin Rock Stone Co.	Plant at ShamsAbad Industrial Zone, Tehran, Tehran Province	NA.
Marble		MGT Stone Co.	Quarry at Sanandaj, Kurdistan Province	NA.
Titanium, ilmenite		Kahnuj pilot plant [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Daregaz placer and Kahnuj titanium dioxide processing plant, Kerman Province	NA.

See footnotes at end of table.

TABLE 2—Continued  
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2021

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
<b>Uranium, U content:</b>				
Mine	metric tons	Atomic Energy Organization of Iran (AEOI) <sup>1</sup>	Saghand Mine, about 125 km northeast of Yazd, Yazd Province	58.
Do.	do.	do.	Gachin Mine, near Bandar Abbas, Hormozgan Province	21.
Processing	do.	do.	Isfahan nuclear conversion plant, Isfahan, Isfahan Province	200.
Do.	do.	do.	Fordow nuclear fuel enrichment plant, 20 km north of Qom, Qom Province	21.
Do.	do.	do.	Bandar Abbas uranium leaching plant, Bandar Abbas, Hormozgan Province	21.
Do.	do.	do.	Natanz nuclear fuel enrichment plant, 80 km southeast of Qom, Qom Province	3.
Do.	do.	do.	Isfahan enriched uranium powder plant, Isfahan, Isfahan Province	2.
<b>Zinc:</b>				
Concentrate, Zn content		Calcimin Co. [Iran Zinc Mines Development Co. (IZMDC)]	Dandi (Angouran) plant, Zanjan Province	500.
Do.		Zangan Zinc Industry LLP [Iran Zinc Mines Development Co. (IZMDC)]	Zanjan plant, Zanjan Province	250.
Do.		Mehdiabad Zinc Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] <sup>1</sup>	Mehdiabad Mine and plant, 115 km southeast of Yazd City, Yazd Province	200.
Do.		Zanjan Zinc Kholes Sazan Industrial Group	Zanjan plant, Zanjan Province	200.
Refined metal		Bafq Zinc Co. [Iran Zinc Mines Development Co. (IZMDC)]	Refinery west of Bafq, Yazd Province	30.
Do.		Bama Co.	Refinery at Isfahan, Isfahan Province	15.
Do.		Bandar Abbas Zinc Production Co. (Calcimin Co.)	Refinery at Bandar Abbas, Hormozgan Province	18.
Do.		Calcimin Co. [Iran Zinc Mines Development Co. (IZMDC)]	Dandi (Angouran) refinery, Zanjan Province	80.
Do.		do.	Refinery at Zanjan, Zanjan Province	4.
Do.		Faravari Mavad Madani Iran Co. [Iran Zinc Mines Development Co. (IZMDC)]	Refinery at Dandi, Zanjan Province	18.
Do.		National Iranian Lead and Zinc Co. (Iran Zinc Mines Development Co.)	Refinery, about 12 km east of Zanjan, Zanjan Province	15.
Do.		Qeshm Zinc Melting and Reduction Co. (Calcimin Co.)	Refinery at Kaveh Industrial Zone, Qeshm Island, Hormozgan Province	20.
Do.		Sane Rooy Zanjan Co.	Refinery at Zanjan, Zanjan Province	11.
Do.		Zanjan Zinc Kholes Sazan Industrial Group	Refinery at Zanjan, Zanjan Province	35.

<sup>0</sup>Estimated. Do., do. Ditto. NA Not available.

<sup>1</sup>Government owned.

<sup>2</sup>Abbreviation(s) used for unit(s) of measure in this table include the following: km—kilometer.

<sup>3</sup>A subsidiary of state-owned Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO).