



2015 Minerals Yearbook

IRAN [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF IRAN

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In 2015, Iran was the world's 2d-ranked producer of gypsum, accounting for 6.1% of the world's output; the 5th-ranked producer of barite (4% of the world's output); 6th-ranked producer of feldspar (5.3%); 7th-ranked producer of bentonite (2.6%); and 10th-ranked producer of kaolin (2.3%) and sulfur (3%). Iran was also the 8th-ranked producer of cement (accounting for 1.4% of the world's output), the 9th-ranked producer of fluorspar (1.2%) and molybdenum (1.5%), and the 10th-ranked producer of iron ore (1.2%). Among mineral fuels, Iran was the world's third-ranked producer of natural gas (accounting for 5.4% of world's output) and the seventh-ranked producer of crude petroleum and condensate (combined, 4.2%) (table 1; BP p.l.c., 2016, p. 8, 16, 22; Apodaca, 2017; Crangle, 2017; Flanagan, 2017; McRae, 2017a, b; Polyak, 2017; Tanner, 2017; Tuck, 2017; van Oss, 2017).

Iran was estimated to hold the world's 2d largest feldspar reserves, the 5th largest barite reserves, the 6th largest gypsum reserves, the 8th largest fluorspar reserves, and the 10th largest iron ore reserves. In 2015, Iran held the world's largest natural gas reserves (accounting for 18.2% of proven worldwide natural gas reserves) and the world's fourth-largest crude petroleum reserves (accounting for 9.3% of proven worldwide crude petroleum reserves) (BP p.l.c., 2016, p. 17; Crangle, 2016; McRae, 2016a, b; Tanner, 2016; Tuck, 2016).

Minerals in the National Economy

Iran's real gross domestic product (GDP) was about the same in 2015 as it was in 2014, whereas it had increased by 3% in 2014 compared with that of 2013. The nominal GDP was \$393.7 billion in 2015. The partial lifting of international sanctions had a positive effect on economic output, but this effect was countered by lower global petroleum prices, which reduced Iran's export earnings. The hydrocarbon sector portion of real GDP was estimated to have increased by 0.5% in 2015 compared with an increase of 4.8% in 2014. The remaining portion of real GDP made up by all other sectors decreased by 0.1% compared with an increase of 2.8% in 2014 (International Monetary Fund, 2015, p. 4, 5, 10; World Bank, The, 2016).

Iran had an extensive nonfuel mineral industry, but its economy remained highly dependent on hydrocarbon production. In 2014, the hydrocarbon sector made up 15.3% of the GDP, whereas mining and manufacturing together accounted for 12.8%. The mineral processing sector, which included the processing and refining of copper and zinc and the production of cement and steel, accounted for an estimated 5% of the GDP, and the mining sector, an estimated 1% (tables 1, 2; Central Bank of the Islamic Republic of Iran, 2015, p. 2; Iran International Magazine, 2015, p. 25).

Government Policies and Programs

The Government-owned holding company Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO) was responsible for the formulation and implementation of the country's policies on mineral exploration and extraction, mine and plant construction and development, and royalty rates on mineral production. The Ministry of Industry, Mine, and Trade (MIMT) issued mineral exploration and extraction licenses (Iranian Mines and Mining Industries Development and Renovation Organization, 2015b).

International sanctions on Iran related to uranium enrichment and reprocessing remained partially in place in 2015. The Joint Comprehensive Plan of Action of July 2015 (commonly known as the "Iran nuclear deal") stipulated the removal of sanctions that prohibited investment in mineral-related facilities and fields, as well as trade in petroleum and petroleum products and trade in gold and other precious metals, graphite, raw and semifinished metals (such as aluminum and steel), and coal (U.S. Department of the Treasury and U.S. Department of State, 2016).

Production

Data on mineral production in Iran are in table 1. The production of copper concentrate (gross weight) increased by 24%; barite, by an estimated 18%; boron and uranium, by an estimated 11% each; and phosphate rock, by an estimated 10%. The production of iron ore (gross weight) decreased by 19%; cement and pig iron, by 12% each; and zinc concentrate (metal content), by 11% (table 1).

Structure of the Mineral Industry

The Government controlled most large-capacity mineral companies through IMIDRO. The leading IMIDRO subsidiaries were Almahdi Aluminum Co. (AHAC) (aluminum and lime), Ehdas Sanat Co. (ESC) (cement), Esfahan Steel Co. (ESCO) (steel), Iranian Aluminum Co. (IRALCO) (aluminum), Iranian Mineral Processing Research Center (IMPRC), Iran Minerals Production and Supply Co. (IMPASCO) (multiple minerals), Iran Zinc Mines Development Co. (lead and zinc), Khouzestan Steel Co. (KSC) (steel), Mobarakeh Steel Co. (MSC) (steel), National Iranian Copper Industries Co. (NICICO) (copper and molybdenum), and National Iranian Steel Co. (NISCO) (steel). The National Iranian Oil Company (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; Iranian Mines and Mining Industries Development and Renovation Organization, 2015c; U.S. Energy Information Administration, 2015, p. 2–3; World Nuclear Association, 2016).

Mineral Trade

Mineral fuels accounted for about 52% of Iran's total exports of \$64.6 billion in 2015 compared with 64% of the \$86.5 billion total in 2014; the decrease in mineral fuel exports and their percentage of total exports was a response to the decrease in global petroleum prices. Crude petroleum exports accounted for most of the country's hydrocarbon exports, which also included condensate and natural gas. Iran's crude petroleum and condensate exports amounted to 1.57 million barrels per day (Mbb/d) in 2015 compared with 1.44 Mbb/d in 2014. In 2015, Iran exported 8.4 billion cubic meters and imported 7.5 billion cubic meters of natural gas. Imports of gas and petroleum products were valued at \$2.2 billion in 2015 compared with \$3.9 billion in 2014 (table 1; BP p.l.c., 2016, p. 28; Central Bank of the Islamic Republic of Iran, 2016, p. 7, 13; Organization of the Petroleum Exporting Countries, 2016, p. 16–17).

Iran's total trade in nonfuel minerals was valued at \$11.4 billion in 2015. Nonfuel mineral exports were valued at \$7 billion and accounted for about 16.5% of total nonfuel exports. Steel and steel products made up 38% of nonfuel mineral exports, followed by cement (10.4%), iron ore (7.4%), copper and copper products (4.1%), aluminum and aluminum products (3.2%), zinc (3.1%), lead (2.2%), chrome (0.7%), ferroalloys (0.6%), molybdenum (0.4%), and coal and coke (0.1%). Nonfuel mineral imports were valued at \$4.4 billion and accounted for 11% of total nonfuel imports in 2015. Steel and steel products made up 68.7% of nonfuel mineral imports, followed by aluminum and aluminum products (7.8%), iron ore (2.7%), titanium (1.9%), coal and coke (1.4%), copper and copper products (0.8%), nickel (0.7%), zinc (0.5%), cement and lead (0.2% each), and precious metals and stones and chromium (0.1% each) (Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 38).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—In 2015, aluminum production remained the same as in 2014, at 355,000 t, whereas alumina production decreased by 4% to 241,000 metric tons (t). Iran Alumina Co., which was Iran's only producer of alumina, operated the country's largest (in terms of output) bauxite mine; the mine, which was located at Jajarm, had reserves of 10.6 million metric tons (Mt) grading 47% aluminum oxide. To meet increased domestic bauxite demand, IMIDRO pursued a policy of increasing the production capacity of the mine at Jajarm, exploring for domestic bauxite deposits, and investing in bauxite mining overseas. Iran Alumina Co. planned to commission the Taash and the Ganou Mines in Semnan Province; the output of these two mines would be mixed with lower grade bauxite from the Jajarm Mine. In 2015, IMIDRO resumed development of the Société des Bauxites de Dabola-Tougué (SBDT) bauxite project in Guinea, which had estimated reserves of 600 Mt of bauxite; production was targeted to begin in 2017 (Financial Tribune, 2015b; Iran International Magazine, 2015, p. 116, 118, 121; Thomson Reuters, 2015; Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 81).

In 2015, Iran's total aluminum and alumina production capacity remained at 487,000 metric tons per year (t/yr) and 280,000 t/yr, respectively. IMIDRO planned to increase annual production to 360,000 t of aluminum and 248,000 t of alumina in 2016 through three projects. In December 2015, IMIDRO signed a contract for the construction and gas supply of the South Aluminum Co. (SALCO) aluminum smelter, which would have a production capacity of 276,000 t/yr of aluminum ingot upon completion of the first phase of construction. IMIDRO also signed contracts for the construction of a 200,000-t/yr alumina powder plant as part of the Sarab nepheline syenite project and a 36,600-t/yr aluminum ingot plant at Jajarm. IMIDRO planned for the Sarab project to produce 150,000 t/yr of salt from nepheline syenite (Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 36–37, 70, 80–81).

Copper and Molybdenum.—In 2015, copper concentrate production increased by 24% to 1.03 Mt, whereas copper cathode production remained at 194,000 t. Iran's copper cathode production capacity was 257,000 t/yr. IMIDRO planned to increase cathode output to 200,000 t/yr in 2016. The three largest mines—Miduk, Sarcheshmeh, and Sungun—were operated by NICICO. The reserves of the Sungun Mine and the Sarcheshmeh Mine were estimated to be 700 Mt at a grade of 0.7% copper and 1.2 billion metric tons (Gt) at a grade of 0.7% copper, respectively. IMIDRO planned to ship extracted copper ores currently transported to the Sarcheshmeh Complex to the Sungun plant instead, which had the capacity to produce 150,000 t/yr of copper concentrate that contained 26% copper (table 1; Ghale, 2015; Iran International Magazine, 2015, p. 32, 35, 39; Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 33, 97).

NICICO had 18 copper production development projects in progress. The company planned to increase the Sungun plant's copper concentrate output to 400,000 t/yr by 2018. NICICO was in the process of building a 70,000-t/yr-capacity hydrometallurgical plant at Sungun, which would produce copper cathode. The company also contracted for the construction of a copper concentrator at Darehzar and a copper and molybdenum concentrator at Nuchoon, which, together, would have a production capacity of 200,000 t/yr of copper concentrate containing 26% copper and, at Nuchoon only, 4,500 t/yr of molybdenum concentrate. The Darehzar-Nuchoon project was planned to be completed in 2016 (International Mining, 2014; National Iranian Copper Industries Co., 2014).

Gold.—Iran had 24 gold mines, of which 15 were operational, 1 was being equipped, and 8 were inactive. Of the country's 15 operational gold mines, 6 had notable gold production. Gold deposits were located in East Azerbaijan, Hamadan, Esfahan, Kerman, Kordestan, Markazi, Qom, Razavi Khorasan, South Khorasan, West Azerbaijan, and Yazd Provinces. The largest mines were, in descending order of reserves, Zarshouran (which was estimated to have 118 t of gold contained in probable reserves, Sari Gunay (63 t), Agh Darreh (30 t), and Muteh (14 t). In 2015, 1,200 sites in 10 Provinces had been identified as possible gold-bearing zones (Iran Daily, 2015; Mukhopadhyay, 2015; PressTV, 2015).

IMIDRO planned to increase total gold ore production to 7 million metric tons per year (Mt/yr) by 2017 from 3.5 Mt/yr in 2015. Ore reserves at the Zarshouran Mine were estimated to be 11.5 Mt at an average grade of 7.9 grams per metric ton (g/t) gold containing 88 t of gold. In 2015, an additional 30 Mt of gold ore reserves was identified. The gold processing plant began operating in November 2014 with a production capacity of 3 t/yr of gold and 2.5 t/yr of silver. In August 2015, IMIDRO announced that production at the Sari Gunay Mine would begin within 3 months. Sari Gunay was expected to produce 2 t/yr of gold from ore grading 1.6 g/t gold (Iran Daily, 2015; Mines & Mining Industries English Magazine, 2015, p. 34; Minews, 2015b, p. 35–36; Mukhopadhyay, 2015; Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 84).

Iron and Steel.—In 2015, Iran's iron ore production was 39.4 Mt compared with 48.5 Mt in 2014. Output, which consisted of lump and pelletized iron ore, was projected to increase to 48 Mt in 2017. The country's total iron ore production capacity was 52 Mt/yr. In 2015, Iran exported 13.1 Mt of iron ore compared with 21.8 Mt in 2014. Exports were projected to decrease to less than 10 Mt in 2017 owing in part to an anticipated increase in demand from domestic steel producers. In 2015, Iran imported 492,000 t of iron ore compared with 500,000 t in 2014 (Serapio, 2015; Shad, 2015, p. 3; Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 34; World Steel Association, 2016, p. 102, 104, 105).

The Sangan, the Gol-e-Gohar, and the Chadormalu Mines were Iran's largest iron ore mines, with reserves of 1,200 Mt, 1,000 Mt, and 200 Mt, respectively. The three mines accounted for about 80% of total iron ore production. The Sangan industrial project was expected to produce 12.4 Mt/yr of iron concentrate and 10 Mt/yr of pellets when the capacity expansion project was completed. Privately owned iron ore mines had a reported total capacity of 12 Mt/yr and accounted for about 20% of the country's production and nearly one-half of its iron ore exports; however, most of the privately owned mines were shut down in 2015 owing to low global iron ore prices (Karbasian, 2014, p. 9; Angel, 2015; Shad, 2015, p. 3; Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 92).

Iran was the leading steelmaker in the Middle East and North Africa region in 2015 with total steel production capacity of 22 Mt/yr. About one-half of steel manufacturing plants operated below capacity or were inactive. In 2015, Iran produced 16.15 Mt of continuously cast crude steel from electric arc furnaces (EAF) compared with 16.33 Mt in 2014; it produced 14.55 Mt of direct-reduced iron (about the same as in 2014) and 2.46 Mt of pig iron (compared with 2.78 Mt in 2014) (Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 32; World Steel Association, 2016, p. 2, 4, 6, 10, 12, 18, 54, 60, 65, 70, 91, 93, 97, 98).

Lead and Zinc.—There were 60 active zinc processing sites in Iran, which together had a production capacity of 450,000 t/yr of zinc and 420,000 t/yr of lead. The country's total concentrate capacity exceeded 2 Mt, but the capacity utilization rate was only 20% owing to a shortage of ore. The average domestic consumption was 100,000 t/yr of zinc and 120,000 t/yr of lead.

About 60% of Iran's combined zinc and lead output was exported (Financial Tribune, 2015a; Iranian Mines and Mining Industries Development and Renovation Organization, 2015e; Minews, 2015a).

The two largest zinc mines were the Mehdi Abad Mine and the Angouran Mine, which had reserves of 160 Mt at a grade of 2% zinc and 9 Mt at a grade of 26% zinc, respectively. In 2015, the Mehdi Abad Lead and Zinc Complex produced about 582,000 t of lead and zinc ore, which was a 77% increase compared with production in 2014. Waste stripping for additional ore extraction was undertaken at the Mehdi Abad zinc mine by Mehdi Abad Zinc Co., which planned to build two processing units with a combined production capacity of 100,000 t/yr of zinc concentrate and 100,000 t/yr of zinc ingots. In August 2015, IMIDRO awarded a new tender to a foreign company to build a processing plant with a production capacity of 800,000 t/yr of zinc concentrate and 80 t/yr of lead and silver concentrate. The Mehdi Abad Mine was expected to become the main supplier of zinc and lead after zinc deposits in the Angouran Mine were exhausted (Financial Tribune, 2015a; 2016a, b; Iranian Mines and Mining Industries Development and Renovation Organization, 2015d, p. 2; 2016, p. 82; Minews, 2015a).

Industrial Minerals

Barite.—Mehdi Abad Zinc operated a barite mine at the Mehdi Abad Complex. The reserves of the mine were estimated to be 113 Mt of barite at an average specific weight of 3.8 grams per cubic centimeter. The Mehdi Abad Complex had initially planned to increase annual production to 500,000 t/yr by 2017, but it exceeded its production target in 2015. K.D.D. Group, which was the owner of the Mehdi Abad Mine, planned to build a barite-processing plant by 2017; the plant would have the capacity to produce 1 Mt/yr of barite (Financial Tribune, 2015a; K.D.D. Group, 2015; Minews, 2015b, p. 41; 2015c; Mehdi Abad Mining Complex, 2016).

Cement.—Iran had about 70 cement plants in operation with a total capacity of 96.0 Mt/yr; of these 70 plants, 62 were gray cement plants with total production capacity of 94.3 Mt/yr, and the remaining ones were white cement plants with a total production capacity of 1.7 Mt/yr. In 2015, cement production decreased by 12% compared with that of 2014. As of yearend 2015, 35% of Iran's cement kilns stopped operating owing to gas shortages. The new gray cement projects that began operation in recent years included Lamerd Cement Co., which had a production capacity of 1.4 Mt/yr at its plant in Fars Province; Urmia Cement Co.'s second development phase of its plant in Orumiyeh, which increased the plant's production capacity to 2 Mt/yr; Azar-Abadegan Khoy Cement Co.'s 1.2-Mt/yr plant, which was one of the country's first private sector cement factories; and Tis Chabahar Cement Co.'s 1.2-Mt/yr Chabahar plant, which was constructed on the Gulf of Oman at Chabahar Port to facilitate seaborne exports. Another 15 Mt of capacity was being installed through the construction of 30 new cement plants in Iran (International Cement Review, 2015, p. 176; Global Cement, 2015, 2016).

Mineral Fuels, Related Materials, and Other Sources of Energy

Iran's primary energy supply sources continued to be natural gas (64.4%) and crude petroleum and petroleum products (33.3%) in 2015. Coal and nuclear energy sources each accounted for less than 0.5% of the country's energy supply (BP p.l.c., 2016, p. 41).

Coal.—In 2015, Iran's hard coal production increased slightly to 1.47 Mt from 1.43 Mt in 2014, and the country's hard coal production capacity remained at 2.7 Mt/yr. IMIDRO planned to increase coal production to 4.6 Mt/yr by upgrading 11 coal mines, of which 4 were located in Tabas; 3, in Kerman; 3, in East Alborz; and 1, in Central Alborz. Upgrades planned to be completed by March 2017 at the following mines would increase Iran's coal production capacity by about 2.7 Mt/yr: the Khomroud Mine in Kerman (which would increase the mine's production capacity to 450,000 t/yr), the Parvadeh 4 Mine in Tabas (450,000 t/yr), the Eastern Parvadeh Mine (600,000 t/yr), and the Parvadeh 2 and Parvadeh 3 Mines (500,000 t/yr combined) (Iranian Mines and Mining Industries Development and Renovation Organization, 2015a; 2016, p. 35).

Natural Gas.—Natural gas was produced mainly in southern Iran and was consumed mostly in the north. Of the country's total natural gas output, only about 80% was marketed. The remainder was either reinjected into petroleum wells to enhance petroleum recovery (12%) or vented and flared (7%). The NIOC projected that up to two-and-one-half times as much natural gas per year would be required for reinjection at petroleum fields to maintain oilfield recovery rates in the next decade (U.S. Energy Information Administration, 2015, p. 10–12).

The South Pars field in the Persian Gulf, which straddled the Iran-Qatar maritime border, accounted for about 60% of Iran's gross natural gas output and held about 40% of its total proven natural gas reserves. In 2015, Iran's daily production from the South Pars field was 430 million cubic meters. The South Pars project, which in 2015 was the country's most significant mineral fuel development project, had 24 planned phases, of which phases 1 through 10, 12, and 15 were complete. Phase 15 became operational in January 2015, and in 2016 (when combined with phase 16), was to have targeted daily output of 56.5 million cubic meters of natural gas, 1.05 Mt of liquid petroleum gas (LPG), 1 Mt of ethane, 75,000 barrels of condensate, and 400 t of sulfur (Almeida, 2015; Financial Tribune, 2015c; Khatinoglu, 2015; Natural Gas Europe, 2015; Rigzone, 2016).

Petroleum and Petroleum Products.—Iran produced 3.23 Mbbbl/d of crude petroleum in 2015 compared with 3.06 Mbbbl/d in 2014. The country's condensate and natural gas liquid (NGL) output was about 0.6 Mbbbl/d. Iran planned to increase crude petroleum production by 800,000 barrels per day (bbl/d) in 2016 once international sanctions were fully lifted and to reach a production capacity of 5.7 Mbbbl/d by 2020 (U.S. Energy Information Administration, 2015, p. 5–6; Central Bank of the Islamic Republic of Iran, 2016, p. 7; Dipaola and Kalantari, 2016; International Energy Agency, 2016).

In November 2015, the Government offered 52 petroleum and natural gas development projects and 18 exploration blocks for bid. Of these projects, 29 were petroleum fields and 23

were natural gas developments projects, and 34 were located onshore and 18 were located offshore. Project development contracts that would be used to set up joint ventures between foreign companies and the NIOC would be valid for 20 years and would provide the foreign companies with a share of the petroleum output. The first contracts were expected to be signed in April 2016 (Motevalli and others, 2015).

Iran had 16 refineries with a total crude distillation capacity of 1.99 Mbbbl/d. In 2015, the refinery throughput was 1.85 Mbbbl/d compared with 1.92 Mbbbl/d in 2014. The Abadan, the Arak, and the Bandar Abbas refineries planned to switch more of their capacity to high-value-added refinery products through facility upgrades. In August 2015, the 600-bbl/d Zarand Tar refinery became operational. The new refinery, which was located near the Zarand coking plant, became the second tar-producing facility in the country after the Esfahan refinery (BP p.l.c., 2016, p. 16–17; Iranian Mines and Mining Industries Development and Renovation Organization, 2016, p. 84; Wilkin, 2016).

Uranium.—Iran was reported to have 1,390 t of indicated and 3,134 t of inferred contained uranium resources as of yearend 2015. In September 2015, a new uranium resource was identified in Yazd Province. Uranium mining and milling took place in Gachin and Saghand. The Bandar Abbas uranium plant produced about 21 t/yr of uranium ore from Gachin ore through acid leaching, which was then delivered to the Esfahan conversion plant. Since its commissioning in 2014 through November 2015, the Esfahan plant had produced 2.3 t of uranium content. In 2015, uranium ore extraction began at the Saghand underground mine, which had resources of 900 t at a grade of 0.055% U. The Ardakan plant was at a precommissioning stage and was expected eventually to produce 50 t/yr of uranium from Saghand ore using acid leaching. The Saghand-Ardakan operation produced an estimated 25 t of uranium in 2015 (Sharafedin, 2015; World Nuclear Association, 2016).

Outlook

Iran's mineral commodity production may increase in coming years if foreign investment materializes and global commodity prices stabilize. Numerous production-capacity expansion projects, especially for metals and industrial minerals, are either currently in progress or were planned by IMIDRO. The production of aluminum, alumina, chromium, coal, copper, gold, iron ore, lead, molybdenum, steel, and zinc may increase substantially if global prices recover. Cement output may reverse its decline if domestic construction activity recovers. Maintenance of current levels of hydrocarbon output in the country depends on technological upgrades, development of new fields, and, perhaps most importantly, the full lifting of international sanctions on Iran.

References Cited

- Almeida, Isis, 2015, Iran is no Qatar, even with world's second-biggest gas reserves: Bloomberg L.P., July 15. (Accessed December 16, 2016, at [http://www.bloomberg.com/news/articles/2015-07-14/iran-no-qatar-even-with-the-world-s-second-biggest-gas-reserves.](http://www.bloomberg.com/news/articles/2015-07-14/iran-no-qatar-even-with-the-world-s-second-biggest-gas-reserves))
- Angel, Maytaal, 2015, Little joy for Iran's private iron ore exporters from nuclear deal: London, United Kingdom, Thomson Reuters, July 14. (Accessed December 15, 2016, at [http://www.reuters.com/article/iran-nuclear-iron-idUSL5N0ZU1KX20150714.](http://www.reuters.com/article/iran-nuclear-iron-idUSL5N0ZU1KX20150714))

- Apodaca, L.E., 2017, Sulfur: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 162–163.
- BP p.l.c., 2016, BP statistical review of world energy—June 2016: London, United Kingdom, BP p.l.c., 44 p.
- Central Bank of the Islamic Republic of Iran, 2015, Economic trends: Central Bank of the Islamic Republic of Iran, no. 79, Fourth quarter 1393 (2014/2015), August 17, 29 p.
- Central Bank of the Islamic Republic of Iran, 2016, Economic trends: Central Bank of the Islamic Republic of Iran, no. 83, Fourth quarter 1394 (2015/2016), July 19, 29 p.
- Crangle, P.D., Jr., 2016, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 76–77.
- Crangle, P.D., Jr., 2017, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 76–77.
- Dipaola, Anthony, and Kalantari, Hashem, 2016, Iran kicks off plan to boost oil exports as sanctions lifted: Bloomberg, January 17. (Accessed February 1, 2017, at <https://www.bloomberg.com/news/articles/2016-01-17/iran-kicks-off-plan-to-boost-oil-exports-as-sanctions-lifted>.)
- Financial Tribune, 2015a, Mehdiabad mine development plan back on track: Financial Tribune [Tehran, Iran], March 14. (Accessed December 8, 2016, at <http://financialtribune.com/articles/economy-business-and-markets/13144/mehdiabad-mine-development-plan-track>.)
- Financial Tribune, 2015b, Plan to expedite bauxite explorations: Financial Tribune [Tehran, Iran], May 28. (Accessed January 31, 2017, at <https://financialtribune.com/articles/economy-business-and-markets/17813/plan-to-expedite-bauxite-explorations>.)
- Financial Tribune, 2015c, South Pars phase 15 gas wells operational: Financial Tribune [Tehran, Iran], January 4. (Accessed March 2, 2017, at <https://financialtribune.com/articles/energy/8150/south-pars-phase-15-gas-wells-operational>.)
- Financial Tribune, 2016a, Iran 2nd leading lead, zinc producer in MENA: Financial Tribune, July 24. (Accessed September 10, 2018, at <https://financialtribune.com/articles/economy-business-and-markets/46098/iran-2nd-leading-lead-zinc-producer-in-mena>.)
- Financial Tribune, 2016b, Mehdi-Abad lead, zinc output up 77%: Financial Tribune [Tehran, Iran], April 7. (Accessed March 1, 2017, at <https://financialtribune.com/articles/economy-business-and-markets/38978/mehdi-abad-lead-zinc-output-up-77>.)
- Flanagan, D.M., 2017, Clays: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 50–51.
- Ghale, A.B., 2015, Copper, a metal for development: National Iranian Copper Industries Co., June 14. (Accessed December 9, 2016, at <http://www.nicico.com/DesktopModules/News/NewsView.aspx?TabID=1&Site=DouranPortal&Lang=en-US&ItemID=8241&mid=14574&wVersion=Staging>.)
- Global Cement, 2015, Iran establishing 30 cement plants: Global Cement News, March 9. (Accessed December 13, 2016, at <http://www.globalcement.com/news/item/3394-iran-establishing-30-cement-plants>.)
- Global Cement, 2016, Gas shortage cripples 35% of Iran's cement production: Pro Global Media Ltd., January 4. (Accessed December 13, 2016, at <http://www.globalcement.com/news/item/4473-gas-shortage-cripples-35-of-iran-s-cement-production>.)
- International Cement Review, 2015, Iran, in *The Global Cement Report* (11th ed.): Dorking, United Kingdom, International Cement Review, p. 175–177.
- International Energy Agency, 2016, Oil market report highlights: Paris, France, International Energy Agency, February 9. (Accessed December 14, 2016, at <https://www.iea.org/oilmarketreport/omrpublic/>.)
- International Mining, 2014, Iran ramping up mining activity and NICICO outlines major expansion: International Mining, July 11. (Accessed December 13, 2016, at <http://im-mining.com/2014/07/11/iran-ramping-up-mining-activity-sarchesmeh-outlines-major-expansion/>.)
- International Monetary Fund, 2015, 2015 Article IV consultation—Press release; staff report; and statement by the Executive Director for the Islamic Republic of Iran: International Monetary Fund, December, 67 p.
- Iran Daily, 2015, Iran discovers new gold reserves: [Tehran] Iran Daily, August 7. (Accessed December 14, 2016, at <http://www.iran-daily.com/News/124082.html>.)
- Iran International Magazine, 2015, Double issue: Iran International Magazine, June, 71 p. (Accessed December 5, 2016, at <http://iraninternationalmagazine.com/ii74-imidro.pdf>.)
- Iranian Mines and Mining Industries Development and Renovation Organization, 2015a, Coal industry in Iran: Iranian Mines and Mining Industries Development and Renovation Organization, 3 p.
- Iranian Mines and Mining Industries Development and Renovation Organization, 2015b, IMIDRO in Iran economy: Iranian Mines and Mining Industries Development and Renovation Organization. (Accessed December 6, 2016, at http://imidro.gov.ir/general_content/398-IMIDRO-IRAN-Economy.html.)
- Iranian Mines and Mining Industries Development and Renovation Organization, 2015c, IMIDRO subsidiaries—Main companies: Iranian Mines and Mining Industries Development and Renovation Organization. (Accessed December 6, 2016, via <http://imidro.gov.ir/?newlang=eng>.)
- Iranian Mines and Mining Industries Development and Renovation Organization, 2015d, Investment fields & development of the Iranian mine & mining industries sector: Iranian Mines and Mining Industries Development and Renovation Organization, June, 22 p.
- Iranian Mines and Mining Industries Development and Renovation Organization, 2015e, Lead and zinc industries in world and Iran: Iranian Mines and Mining Industries Development and Renovation Organization, 3 p.
- Iranian Mines and Mining Industries Development and Renovation Organization, 2016, Action report—An overview of actions taken by IMIDRO in 2015–2016 future plans: Iranian Mines and Mining Industries Development and Renovation Organization, 101 p.
- Karbasiyan, Mehdi, 2014, Overview of the Iranian iron and steel markets: Iranian Mines and Mining Industries Development and Renovation Organization, December, 19 p.
- K.D.D. Group, 2015, Mehdiabad zinc project: K.D.D. Group. (Accessed December 15, 2016, at <http://www.kdd-group.com/en/Project/item/Projects/21/Mehdiabad%20Zinc%20Project>.)
- Khatinoglu, Dalga, 2015, Reasons for Iran to focus on South Pars gas field: Trend News [Baku, Azerbaijan], August 29. (Accessed December 17, 2016, at <http://en.trend.az/business/energy/2428192.html>.)
- McRae, M.E., 2016a, Barite: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 30–31.
- McRae, M.E., 2016b, Fluorspar: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 62–63.
- McRae, M.E., 2017a, Barite: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 30–31.
- McRae, M.E., 2017b, Fluorspar: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 62–63.
- Mehdi Abad Mining Complex, 2016, Mehdiabad Mine barite production rises by 18%: Mehdiabad Mine, November 21. (Accessed December 18, 2016, at <http://mehdiabadmine.com/mehdiabad-mine-barite-production-rises-by-18/?lang=en>.)
- Mines & Mining Industries English Magazine, 2015, Zarshouran Gold—The mining industry's flagship project: Mines & Mining Industries English Magazine, January, p. 34–36.
- Minews, 2015a, Angouran zinc and lead extraction on the rise: Minews, May 15. (Accessed December 17, 2016, at <http://www.minews.ir/en/doc/news/24458/angouran-zinc-and-lead-extraction-on-the-rise>.)
- Minews, 2015b, Iran Mines & Mining Industries Summit—Development & investment: Tehran, Iran, Mines and Mining Industries News, May 31–June 1, 64 p. (Accessed December 10, 2016, at <http://www.minews.ir/images/docs/files/000024/nf00024857-1.pdf>.)
- Minews, 2015c, Plan to boost barite extraction in Mehdiabad: Tehran, Iran, Mines and Mining Industries News, May 18. (Accessed December 16, 2016, at <http://www.minews.ir/en/doc/news/24539/plan-to-boost-barite-extraction-in-mehdiabad>.)
- Motevalli, Golnar, Dipaola, Anthony, and Kalantari, Hashem, 2015, Oil's big players line up for \$30 billion of projects in Iran: Bloomberg L.P., November 28. (Accessed December 17, 2016, at <http://www.bloomberg.com/news/articles/2015-11-28/oil-majors-queue-up-in-iran-with-30-billion-of-projects-in-play>.)
- Mukhopadhyay, Sounak, 2015, Iran discovers 10 new gold-mining zones—Boosts capacity at existing Zarshuran Mine: International Business Times [New York, New York], August 7. (Accessed December 15, 2016, at <http://www.ibtimes.com/iran-discovers-10-new-gold-mining-zones-boosts-capacity-existing-zarshuran-mine-2044109>.)
- National Iranian Copper Industries Co., 2014, 18 copper industry's development plans announced: National Iranian Copper Industries Co., November 6. (Accessed December 14, 2016, at <http://nicico.com/DesktopModules/News/NewsView.aspx?TabID=1&Site=DouranPortal&Lang=en-US&ItemID=7780&mid=14574&wVersion=Staging>.)
- Natural Gas Europe, 2015, Iran, Qatar in competition over world's biggest gas field: Natural Gas Europe, December 23. (Accessed December 17, 2016, at <http://www.naturalgaseurope.com/iran-qatar-in-competition-over-worlds-biggest-gas-field-27264>.)

- Organization of the Petroleum Exporting Countries, 2016, OPEC annual statistical bulletin 2016: Vienna, Austria, Organization of the Petroleum Exporting Countries, 112 p.
- Polyak, D.E., 2017, Molybdenum: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 112–113.
- PressTV, 2015, Iran tenders new gold mine in Qazvin: PressTV, October 14. (Accessed December 12, 2016, at <http://www.presstv.com/Detail/2015/10/14/433374/Iran-gold-mine-Takestan-tender-investment->.)
- Rigzone, 2016, Iran expects South Pars Project to be fully operational by March 2018: Rigzone, January 12. (Accessed December 17, 2016, at http://www.rigzone.com/news/oil_gas/a/142437/Iran_Expect_South_Pars_Project_to_be_Fully_Operational_by_March_2018.)
- Serapio, Manolo, Jr., 2015, Iran ore exports may dry up on weak prices, steel target: London, United Kingdom, Thomson Reuters, September 24. (Accessed December 13, 2016, at <http://www.reuters.com/article/iran-ironore-exports-idUSL4N11U0AS20150924>.)
- Shad, A.K., 2015, Iron ore in the world & Iran: Iranian Mines and Mining Industries Development and Renovation Organization, 4 p.
- Sharafedin, Bozorgmehr, 2015, Iran says finds unexpectedly high uranium reserve: London, United Kingdom, Thomson Reuters, September 12. (Accessed December 16, 2016, at <http://www.reuters.com/article/us-iran-nuclear-uranium-idUSKCN0RC0A020150912>.)
- Tanner, A.O., 2016, Feldspar and nepheline syenite: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 60–61.
- Tanner, A.O., 2017, Feldspar and nepheline syenite: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 60–61.
- Thomson Reuters, 2015, Guinea renews bauxite contract with Iran: London, United Kingdom, Thomson Reuters, August 10. (Accessed December 12, 2016, at <http://af.reuters.com/article/guineaNews/idAFL5N10K0MK20150809>.)
- Tuck, C.A., 2016, Iron ore: U.S. Geological Survey Mineral Commodity Summaries 2016, p. 90–91.
- Tuck, C.A., 2017, Iron ore: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 90–91.
- U.S. Department of the Treasury and U.S. Department of State, 2016, Guidance relating to lifting of certain U.S. sanctions pursuant to the Joint Comprehensive Plan of Action on implementation day: Washington, DC, U.S. Department of the Treasury and U.S. Department of State, January, 42 p.
- U.S. Energy Information Administration, 2015, Iran: U.S. Energy Information Administration report, June 19, 16 p.
- van Oss, H.G., 2017, Cement: U.S. Geological Survey Mineral Commodity Summaries 2017, p. 44–45.
- Wilkin, Sam, 2016, Iran mulls investment stakes in foreign refineries: London, United Kingdom, Thomson Reuters, February 8. (Accessed December 16, 2016, at <http://www.hydrocarbonprocessing.com/Article/3527775/Iran-mulls-investment-stakes-in-foreign-refineries.html>.)
- World Bank, The, 2016, The World Bank in Islamic Republic of Iran—Overview: The World Bank. (Accessed December 8, 2016, at <http://www.worldbank.org/en/country/iran/overview>.)
- World Nuclear Association, 2016, Nuclear power in Iran: London, United Kingdom, World Nuclear Association Country Profile, December. (Accessed December 10, 2016, at <http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Iran/>.)
- World Steel Association, 2016, Steel statistical yearbook 2016: World Steel Association, December, 128 p.

TABLE 1
IRAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2011	2012	2013	2014	2015	
METALS						
Aluminum:						
Bauxite, gross weight	847,000	892,000	788,600	540,000	520,000 ^e	
Alumina	233,000	227,000	249,000 ^f	251,000 ^f	241,000	
Metal, primary ingot	329,000 ^f	337,000 ^f	350,000 ^f	355,000 ^f	355,000	
Antimony	600	--	400	432	430 ^e	
Chromite, mine output, concentrate:						
Gross weight	440,000	412,000	410,000	339,000 ^f	340,000 ^e	
Cr ₂ O ₃ content	189,200	192,200	191,100	158,000	160,000 ^e	
Copper:						
Mine output:						
Ore mined (0.6% to 1.2% Cu):						
Gross weight	thousand metric tons	37,290	34,780	32,420	35,900 ^f	44,500 ^e
Cu content		258,900	238,000	222,900	246,800 ^f	306,100
Concentrate (27% to 35% Cu):						
Gross weight		940,000	950,000	750,000	831,000 ^f	1,030,000
Cu content ^e		255,000	260,000	210,000	233,000 ^f	288,000
Metal:						
Smelter output, blister or anode		270,000	271,000	224,000	232,500	233,000 ^e
Refined output, cathode		235,000	213,000	188,000 ^f	194,000	194,000
Gold, mine output, Au content ³	kilograms	2,200	2,800	2,500	3,300	3,500 ^e
Iron and steel:						
Ore and concentrate:						
Gross weight	thousand metric tons	35,843	39,783	48,175	48,451	39,370
Fe content	do.	17,600	19,500	23,600	23,700	19,300
Metal:						
Pig iron	do.	2,242	2,143	2,007	2,782	2,459
Direct-reduced iron	do.	10,368	11,582	14,458	14,551	14,546
Steel, crude, ingots and castings	do.	13,197	14,463	15,422	16,331	16,146
Lead:						
Mine output, concentrate:						
Gross weight ^e		85,000 ^f	96,000 ^f	89,000 ^f	94,000 ^f	87,000
Pb content		40,000 ^f	45,000 ^f	42,000 ^f	44,000 ^f	41,000
Metal		82,000	81,000	76,000	72,000	78,000
Manganese, mine output (30% to 35% Mn):						
Gross weight ^e		228,000	195,000	207,000	167,000	168,000
Mn content		77,200	66,100	70,200	56,600	57,000 ^e
Mercury		2	--	10	12	12
Molybdenum, mine output, concentrate:						
Gross weight ^e		6,000	6,300	6,200	6,200	6,200
Mo content		3,365	3,516	3,471	3,494	3,500 ^e
Silver		101	96	85	80	90 ^e
Zinc:						
Mine output, concentrate:						
Gross weight ^e		280,000	284,000 ^f	272,000 ^f	282,000 ^f	252,000
Zn content		138,000	140,000 ^f	134,000 ^f	139,000 ^f	124,000
Metal		132,000	148,000	140,000	145,000	138,000
INDUSTRIAL MINERALS						
Arsenic		98	101	110	110	110 ^e
Barite		407,000 ^f	393,000 ^f	420,000 ^f	446,000 ^f	526,000 ^e
Boron, borax		1,044	3,000	914	180	200 ^e
Cement, hydraulic	thousand metric tons	66,000	70,250	68,700	66,700 ^f	58,600
Clays:						
Bentonite		422,000	427,000	397,100	419,700	420,000 ^e
Industrial clays ^e		550,000	550,000	550,000	600,000	600,000
Kaolin		762,000	800,000	946,400	820,100	850,000 ^e
Diatomite		--	--	9,500	9,900	10,000 ^e
Feldspar		576,600	1,100,000	1,313,200	1,128,600	1,200,000 ^e
Fluorspar		56,000 ^f	80,000	69,800 ^f	78,700 ^f	79,000 ^e

See footnotes at end of table.

TABLE 1—Continued
 IRAN: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2011	2012	2013	2014	2015
INDUSTRIAL MINERALS—Continued					
Gemstones, turquoise ^c					
kilograms	20,000	21,000	21,000	21,000	21,000
Graphite	360	--	--	--	--
Gypsum	18,300 ^r	19,000 ^r	21,100 ^r	19,600 ^r	20,000 ^c
thousand metric tons					
Magnesite	172,700	143,000	170,700	165,900	170,000 ^c
Mica	7,130	7,000	7,000	7,000	7,000
Perlite	20,000	30,000	55,100	42,600	45,000 ^c
Phosphate rock:					
Ore ^c	370,000	370,000	380,000	122,000	134,000
P ₂ O ₅ content	110,000	110,000	113,600	36,500	40,000 ^c
Salt	2,714,700	2,962,000	2,078,682	3,940,100	4,000,000 ^c
Stone, construction and building, crushed ^{c,4}	26,000	27,000	27,000	27,000	27,000
thousand metric tons					
Strontium, celestite	40,000	20,000	--	20,000	20,000 ^c
Sulfur:					
Byproduct of petroleum and natural gas	1,575,000	2,000,000	2,100,000	2,100,000	2,200,000 ^c
Byproduct of metallurgical processing, S content of acid ^c	75,000	90,000	95,000	95,000	100,000
Total ^c	1,650,000	2,090,000	2,195,000	2,195,000	2,300,000
Talc	59,000 ^r	116,000	93,000 ^r	52,000 ^r	55,000 ^c
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Hard	942 ^r	831 ^r	1,183 ^r	1,434 ^r	1,470
thousand metric tons					
Lignite	2,327	2,820	2,800	2,700	2,800 ^c
do.					
Coke	1,052	940	1,002 ^r	1,000	1,000 ^c
do.					
Gas, natural:					
Gross	224,122	231,332	228,887	244,551	257,623
million cubic meters					
Dry	188,753	202,431	199,293	212,796	226,673
do.					
Petroleum:					
Crude ⁵	1,630,090 ^r	1,392,110 ^r	1,318,015 ^r	1,363,640 ^r	1,430,800
thousand 42-gallon barrels					
Refinery products:					
Motor gasoline	112,603	152,789	166,331	150,563 ^r	154,176
do.					
Kerosene	42,669	45,443	45,443	50,261 ^r	47,012
do.					
Distillate fuel oil	218,307	202,794	214,839	194,545 ^r	199,071
do.					
Residual fuel oil	177,828	173,850	187,172	169,470 ^r	167,097
do.					
Other	86,870	86,505	86,505	96,360	96,360
do.					
Total	638,277	661,381	700,290	661,199 ^r	663,716
do.					
Uranium	12	15	40	45	46

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through December 18, 2016.

²In addition to the commodities listed, bromine, caustic soda, crude construction materials (such as sand and shell), dimension stone, dolomite, ferroalloys, hafnium oxide, ilmenite, industrial or glass sand (quartzite and silica), iron oxide pigments, refined lead, lime, limestone, nepheline syenite, nitrogen, pumice, selenium, silicomanganese, soda ash, vermiculite, zeolites, and zirconium metal may have been produced, but available information was inadequate to make reliable estimates of output.

³Includes gold recovered from the Sarcheshmeh copper complex.

⁴Includes marble and travertine.

⁵Includes natural gas liquids (NGL).

TABLE 2
IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2015¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Iran Alumina Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Northeast of Jajarm, Khorasan-e Shomali Province	280
Aluminum	Iranian Aluminium Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ² majority interest, and a joint venture of Industrial Development Investment Co. and a subsidiary of Mehr Finance & Credit Institution, 40%	Arak, Markazi Province	230
Do.	Almahdi Aluminium Co. [(Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Bandar Abbas, Hormozgan Province	257
Barite	Mehdi Abad Zinc Co. (K.D.D. Group)	Mehdi Abad Mine, Yazd Province	600
Bauxite	Iran Alumina Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Jajarm Mine, about 15 kilometers northeast of Jajarm	800
Cement	Abadeh Cement Co.	Abadeh, Fars Province	393
Do.	Abyek Cement Co. (Fars & Khuzestan Cement Co.)	Abyek, Qazvin Province, 80 kilometers northwest of Tehran	3,900
Do.	Anarak Special Cement Co.	Anarak, Markazi Province	500
Do.	Ardebil Cement Co. (Espandar Cement Investment Co.)	Namin, Ardabil Province	1,092
Do.	Ardestan Cement Co.	North of Esfahan, Esfahan Province	1,092
Do.	Azar-Abadegan Khoey Cement Co.	West Azerbaijan Province	1,095
Do.	Behbahan Cement Co. (Fars & Khuzestan Cement Co.)	Behbahan, Khuzestan Province	718
Do.	Benvid White Cement Co. (Bank Melli Iran Investment Co.)	Benvid, Esfahan Province	164
Do.	Bojnourd Cement Plant (Fars & Khuzestan Cement Co.)	About 37 kilometers from Bojnourd, Khorasan-e Shomali Province	1,654
Do.	Bushehr Cement Co. (Dashtestan Cement)	Borazjan, Bushehr Province	1,000
Do.	Darab Cement Co. [General public (Justice shares), 50%, and Bank Melli Iran Investment Co., 29%]	About 190 kilometers southeast of Shiraz, Fars Province	1,123
Do.	Dashtestan Cement Co.	NA	936
Do.	Doroud Cement Co. (Fars & Khuzestan Cement Co.)	Doroud, Lorestan Province	1,245
Do.	East White Cement Co.	NA	330
Do.	Ekbatan Cement Co. (Espandar Cement Investment Co.)	Ekbatan, Tehran Province	114
Do.	Estahban Cement Co.	20 kilometers west of Estahban, Fars Province	350
Do.	Faraz Firouzkhuh Cement Co. (Espandar Cement Investment Co.)	About 180 kilometers northeast of Tehran	1,030
Do.	Fars Cement Co. (Fars & Khuzestan Cement Co.)	Shiraz, Fars Province	819
Do.	Fars Now Cement Co. (Fars & Khuzestan Cement Co.)	About 65 kilometers southeast of Shiraz, Fars Province	936
Do.	Ghaen Cement Co. (Cement Investment and Development Co., 26%, and Bank Melli Iran Investment Co., 14%)	Qayen (Ghaen), Khorasan-e Jonubi Province	811
Do.	Gharb Cement Co. (Fars & Khuzestan Cement Co.)	Kermanshah, Kermanshah Province	1,248
Do.	Gilan Sabz Cement Co.	Deylaman, Gilan Province	1,200
Do.	Hegmatan Cement Co. (Tehran Cement Co., 79%)	East of Razan, Hamadan Province	2,059
Do.	Hormozgan Cement Co. (OMID Investment Co.)	About 75 kilometers west of Bandar Abbas	1,872
Do.	Ilam Cement Co. (Tehran Cement Co., 47%)	Northeast of Ilam, Ilam Province	1,654
Do.	Isfahan Cement Co.	Esfahan, Esfahan Province	1,036
Do.	Jovein Cement Co.	Jovein, Khuzestan Province	1,400
Do.	Karoun Cement Co.	Near Masjed Soleyman, Khuzestan Province	936
Do.	Kavan Boukan Cement Co.	Near Kashan, Esfahan Province	1,030
Do.	Kavir Kashan Cement Co. (Espandar Cement Investment Co.)	do.	557
Do.	Kerman Cement Co. (Bank Melli Iran Investment Co., 38%)	Kerman, Kerman Province	1,148
Do.	Khamseh Cement Co.	Zanjan Province	1,061
Do.	Khash Cement Co. (Fars & Khuzestan Cement Co.)	Khash, Sistan va Baluchestan Province	811
Do.	Khazar Cement Co. (Fars & Khuzestan Cement Co.)	About 80 kilometers northwest of Qazvin, Qazvin Province	1,248
Do.	Khuzestan Cement Co. (Fars & Khuzestan Cement Co.)	Ramhormoz, Khuzestan Province	2,496
Do.	Kohkiloye Yasuj Cement (State Retirement Organization ³ and Fars & Khuzestan Cement Co.)	Behbahan, near Deh Dasht, Kohkiloye, Kohgiluyeh va Bowyer Ahmad Province	1,200
Do.	Kordestan Cement Co. (Ghadir Investment Co.)	North of Bijar, Kordestan Province	998
Do.	Lamerd Cement Co.	Lamerd, Fars Province	1,030
Do.	Lar-e Sabzevar Cement Co.	Sabzevar, Khorasan-e Razavi Province	1,030

See footnotes at end of table.

TABLE 2—Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2015¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement—Continued:	Larestan Cement Co.	Fars Province	142
Do.	Loshan Cement Co. (Tehran Cement Co., 66%)	Loshan, Gilan Province	206
Do.	Mazandaran Cement Co. (Bank Melli Iran Investment Co., 60%)	Neka, Mazandaran Province	2,278
Do.	Momtazan Cement Co.	Kerman, Kerman Province	1,030
Do.	Naeen Cement Co.	NA	1,560
Do.	Nahavend Cement Co.	NA	1,030
Do.	Neyriz White Cement Co. (Fars & Khuzestan Cement Co.)	Neyriz, Fars Province	164
Do.	Neyzar Qom Cement Co.	NA	1,030
Do.	Omran Anarak Cement Co.	Delijan, Markazi Province	1,030
Do.	Qeshm Cement Co.	Qeshm Island, Hormozgan Province	240
Do.	Peyvand Golestan Cement Co.	NA	1,030
Do.	Safaieh Cement Co.	NA	624
Do.	Saman Gharb Cement Co.	NA	2,184
Do.	Sarooj Bushehr International Co.	Kangan, Bushehr Province	624
Do.	Saveh Grey Cement Co. (Fars & Khuzestan Cement Co.)	Saveh, Markazi Province	2,246
Do.	Saveh White Cement Co. (Fars & Khuzestan Cement Co.)	do.	230
Do.	Sepahan Cement Co. (Ghadir Investment Co.)	Mobarakeh, Esfahan Province	3,089
Do.	Shahrekord Cement Co.	NA	1,030
Do.	Shahroud Cement Co. (Fars & Khuzestan Cement Co.)	Shahroud, Semnan Province	1,872
Do.	Sharg Cement Co. (Ghadir Investment Co.)	Mashhad, Khorasan-e Razavi Province	1,997
Do.	Shomal Cement Co. (Bank Melli Iran Investment Co., 59%)	Pardis, Tehran Province	1,248
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%)	About 33 kilometers northwest of Tabriz, East Azerbaijan Province	2,184
Do.	Tehran Cement Co. (Ghadir Investment Co.)	Tehran, Tehran Province	3,170
Do.	Tejarat Mehriz Cement Co.	NA	1,123
Do.	Tis Chabahar Cement Co.	Chabahar, Sistan and Baluchestan Province	6,000
Do.	Urmia Cement Co. (Fars & Khuzestan Cement Co.)	Orumiyeh, West Azerbaijan Province	1,966
Do.	Urmia White Cement Co.	do.	164
Do.	Yasouj Cement Co.	NA	218
Do.	Yazd Bohrouk Cement Co.	Yazd, Yazd Province	1,100
Do.	Zabol Cement Co.	NA	1,030
Do.	Zanjan Cement Co. (Fars & Khuzestan Cement Co.)	Zanjan, Zanjan Province	606
Do.	Zarin Rafsanjan Cement Co.	NA	218
Do.	Zarveh Torbat Cement Co.	Torbat e-Heydariyeh, Khorasan-e Razavi Province	1,092
Chromite (Cr ₂ O ₃ content)	Faryab Mining Co.	Faryab Mine and processing plant, Minab, Hormozgan Province	180 ^e
Do.	Esfandaghe Mines Co.	Abdasht Mine, Kerman Province; Suqan (Saboughan) Mine, Kerman Province; Processing plant at Esfandaghe, Kerman Province	30
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
Coke	Isfahan Steel Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Plant about 40 kilometers southwest of Esfahan, Esfahan Province	900
Do.	Middle East Coke Production Co. [[Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	NA	800
Do.	Tabas Coke Production Co. [Iranian Mines and Mining Development and Renovation Organization (IMIDRO)] ²	NA	450
Do.	Zarand Iranian Steel Co.	Zarand, Kerman Province	400
Coal	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Eastern Parvadeh Mine, Tabas Province	600
Do.	do.	Khomroud Mine, Kerman Province	450

See footnotes at end of table.

TABLE 2—Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2015¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity
Coal—Continued	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²		Parvadeh 4 Mine, Tabas Province	450
Do.	do.		Parvadeh 2 and 3 Mines, Tabas Province	500
Do.	do.		Kordobad Mine, Savadkouh Province	230
Do.	do.		Hashouni and Pabdana Mines, Kerman Province	150
Do.	do.		Takht and Vatan Mines, Alborz Province	150
Copper:				
Concentrate (Cu content)	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²		Sarcheshmeh Complex, south of Rafsanjan, Kerman Province	670
Do.	do.		Sungun Mine and Plant, East Azerbaijan Province	150
Do.	do.		Miduk Mine, Kerman Province	150
Do.	do.		Qal'eh Zari Mine, about 120 kilometers southwest of Birjand, Khorasan-e Jonubi 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, Semnan Province	5
Smelter output	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²		Smelter, Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	158
Do.	do.		Smelter near Khatoonabad, Kerman Province	80
Refined metal	do.		Refinery, Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	210
Do.	do.		Electrowon plant, Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	14
Do.	do.		Electrowon plant, Miduk copper complex, Kerman Province	5
Gemstones, turquoise	NA		Neyshabur Mine, Khorasan-e Razavi Province	6 ^e
Gold:				
Ore, Au content	kilograms	Iran Minerals Production and Supply Co. (IMPSACO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Muteh Mine (Chah Khaton and Senjedeh pits), Esfahan Province, and Kuh-e-Zar Mine, Semnan Province	300
Do.	do.	Zarshouran Gold Mine and Mining Industries Development and Renovation Company [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Zarshouran Mine, 31 kilometers north of Takab, West Azerbaijan Province	3,000
Do.	do.	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Joint product of production from various copper mines	600
Do.	do.	Pooya Zarcan Agh Darreh	Agh Darreh	2,200
Do.	do.	Zar Kuh Mining Co.	Sari Gunay Mine, Kordestan Province	2,000
Do.	do.	Artisanal placer operations	Neyshabur area, Khorasan-e Razavi Province	NA
Metal ³	do.	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Sarcheshmeh copper complex, south of Rafsanjan, Kerman Province	210
Iron and steel:				
Iron ore	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), ² 8%]		Chadormalu Mine, 80 kilometers north of Bafgh, 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), ² 18%]		Gol-e-Gohar Mine, about 50 kilometers southwest of Sirjan, Kerman Province	7,000
Do.	Iran Central Iron Ore Co. [National Iranian Steel Co. (NISCO), 100%] ⁵		Choghart Mine, Bafgh, Yazd Province	3,250

See footnotes at end of table.

TABLE 2—Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2015¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel—Continued:			
Iron ore—Continued	Iranian Minerals Production and Supply Co. (IMPASCO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²	Jalal Abad Mine, about 40 kilometers northwest of Zarand	2,000
Do.	NA	Chah Gaz Mine, Yazd Province	NA
Do.	NA	Mishdovan Mine, Yazd Province	NA
Do.	Sangan Iron Ore Co. [National Iranian Steel Co. (NISCO)] ⁴	Sangan (Songun) Mine, about 140 kilometers southeast of Torbat e-Heydariyeh, Khorasan-e Razavi Province	2,600
Do.	About 20 small privately owned mines	NA	1,000 ^e
Cast iron	Zagros Steel Co. (Government, majority interest)	Foundry in Kordestan Province	70
Direct reduced	Mobarakeh Steel Co. [National Iranian Steel Co. (NISCO)] ⁴	Direct-reduction iron plant about 50 kilometers southwest of Esfahan, Esfahan Province	5,000
Do.	Khouzestan Steel Co. [National Iranian Steel Co. (NISCO)] ⁴	Direct-reduction iron plant, Ahwaz, Khuzestan Province	4,000
Do.	Hormozgan Steel Co. [National Iranian Steel Co. (NISCO) ⁴ and partners]	Direct-reduction iron plant, Gachin, Hormozgan Province	1,500
Do.	Esfahan Steel Co. [National Iranian Steel Co. (NISCO)] ⁴	Direct-reduction iron plant about 40 kilometers southwest of Esfahan, Esfahan Province	600
Steel, crude	Mobarakeh Steel Co. [National Iranian Steel Co. (NISCO)] ⁴	Plant about 50 kilometers southwest of Esfahan, Esfahan Province	5,400
Do.	Khouzestan Steel Co. [National Iranian Steel Co. (NISCO)] ⁴	Plant at Ahwaz, Khuzestan Province	3,600
Do.	Esfahan Steel Co. [National Iranian Steel Co. (NISCO)] ⁴	Plant about 40 kilometers southwest of Esfahan, Esfahan Province	3,600
Do.	Kish South Kaveh Steel Co. (SKS)	Hormozgan Province	1,200
Do.	Khorasan Steel Co. [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ² majority interest, and a Government pension fund, 40%	Plant at Neyshabur, Khorasan-e Razavi Province	650
Do.	Vian Steel Melting and Casting Co.	Plant, about 42 kilometers of Hamadan, Hamadan Province	600
Do.	Meibod (Maybod) Steel Co. (Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)], ² 50%	About 15 kilometers southwest of Meybod, Yazd Province	300
Lead:			
Concentrate, Pb content	Calcimin Co. (Iran Zinc Mine Development Co.)	Dandi (Angouran) zinc and lead concentrator plant, Zanjan Province	30
Do.	Zanjan Zinc Khales Sazan Industrial Group	Zanjan plant, Zanjan Province	20
Refined metal	National Iranian Lead and Zinc Co. (Iran Zinc Mine Development Co.)	About 12 kilometers east of Zanjan, Zanjan Province	40
Lead and zinc:			
Ore	Iran Zinc Mines Development Co.	Angouran open pit mine, Dandi, Zanjan Province	1,000
Do.	Mehdi Abad Zinc Co. (K.D.D. Group)	Mehdi Abad Mine, Yazd Province	700
Do.	Ber-Oner Tehran Co.	Emarat Mine, about 25 kilometers southwest of Arak, Markazi Province	150
Do.	Bafgh Mining Co.	Koushk Mine, Yazd Province	120
Do.	BAMA Co. (Irakouh)	Irakouh complex (Gooshfil underground and Tappeh Sorkh open pit mines, about 20 kilometers southeast of Esfahan, Esfahan Province, and Kolah Darvazeh Mine, south of Esfahan, Esfahan Province)	100
Magnesite	Birjand Refractory Mining Co. (Iranian Refractories Procurement & Production Co.)	Hoz Sefid, Shirkuhak, and Torshak Mohammadi Mines, about 50 kilometers southeast of Birjand, Khorasan-e Jonubi Province	NA

See footnotes at end of table.

TABLE 2—Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2015¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity
Molybdenum, concentrate	National Iranian Copper Industries Co. (NICICO) [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²		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. (Government, 100%)	Associated gas from company oilfields	96
Do.	do.	do.	Aghar, Dalan, Kangan, and Nar gasfields	57
Do.	do.	Pars Oil and Gas Co. (National Iranian Oil Co., 100%) ²	South Pars gasfields, offshore	160
Petroleum:				
Crude	million 42-gallon barrels	National Iranian Oil Co. (Government, 100%)	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. 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. and buyback contract joint venture of Total S.A. (55%) and Eni SpA (45%)	Doroud field, offshore	65
Do.	do.	National Iranian Oil Co. 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. and buyback contract joint venture of Total S.A. (60%) and Naftiran Intertrade Co. (40%)	Darquain field, onshore	17
Refined products	thousand 42-gallon barrels per day	National Iranian Oil Refining and Distribution Co. (NIORDC) (Government, 100%)	Refinery at Abadan	399
Do.	do.	do.	Refinery at Isfahan	375
Do.	do.	do.	Refinery at Bandar Abbas	284
Do.	do.	do.	Refinery at Tehran	245
Do.	do.	do.	Refinery at Arak	242
Do.	do.	do.	Refinery at Borzuyeh	120
Do.	do.	do.	Refinery at Tabriz	110
Do.	do.	do.	Refinery at Shiraz	56
Do.	do.	do.	Refinery at Kermanshah	48
Do.	do.	do.	Refinery at BooAli Sina	34
Do.	do.	do.	Refinery at Lavan	22
Do.	do.	do.	Refinery at Aras 2	10
Do.	do.	do.	Refinery at Booshehr	10
Do.	do.	do.	Refinery at Aras 1	5
Do.	do.	do.	Refinery at Yazd	3
Do.	do.	do.	Refinery at Zarand	1
Phosphate rock	Esfordi Phosphate Complex (Iran Minerals Production & Supply Co.) ²		About 35 kilometers northeast of Bafgh, Yazd Province	500
Potash	Khur and Biabanak Potash Complex (Iran Minerals Production & Supply Co.) ²		Near Khur and Biabanak Mines, Isfahan Province	NA
Titanium, ilmenite	Kahnuj pilot plant [Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO)] ²		Daregaz placer and Kahnuj titanium dioxide processing plant	NA
Uranium	metric tons	Atomic Energy Organization of Iran (Government)	Saghand Mine, about 125 kilometers northeast of Yazd, Yazd Province	58
Do.	do.	do.	Gachin Mine, near Bandar Abbas, Hormozgan Province	21
Do.	do.	do.	Natanz nuclear fuel enrichment plant, 80 kilometers southeast of Qom, Qom Province	3

See footnotes at end of table.

TABLE 2—Continued
 IRAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2015¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Uranium— Continued	Atomic Energy Organization of Iran (Government)	Fordow nuclear fuel enrichment plant, 20 kilometers north of Qom, Qom Province	21
Do.	do.	Bandar Abbas uranium plant, Bandar Abbas, Hormozgan Province	12
Do.	do.	Isfahan nuclear conversion plant, Isfahan, Isfahan Province	200
Do.	do.	Isfahan enriched uranium powder plant, Isfahan, Isfahan Province	2
Do.	do.	Arak heavy water reactor, Arak, Markazi Province	NA
Zinc:			
Concentrate, Zn content	Calcimin Co. (Iran Zinc Mine Development Co.)	Dandi (Angouran) zinc and lead concentrator plant, Zanjan Province	500
Do.	Zangan Zinc Industry (LLP) (Iran Zinc Mine Development Co.)	Zanjan plant, Zanjan Province	250
Do.	Zanjan Zinc Kholes Sazan Industrial Group	do.	200
Do.	Mehdi Abad Zinc Co. (K.D.D. Group)	Mehdi Abad plant, Yazd Province	100
Refined metal	Calcimin Co. (Iran Zinc Mine Development Co.)	Dandi (Angouran) plant, Zanjan Province	80
Do.	Zanjan Zinc Kholes Sazan Industrial Group	Zanjan, Zanjan Province	35
Do.	Bafgh Zinc Co. (Iran Zinc Mine Development Co.)	West of Bafgh, Yazd Province	30
Do.	Qeshm Zinc Smelter Co. (affiliate of Calcimine Co.)	Kaveh Industrial Zone, Qeshm Island, Hormozgan Province	20
Do.	Faravari Mavad Madani Iran Co. (Iran Zinc Mine Development Co.)	Dandi, Zanjan Province	18
Do.	National Iranian Lead and Zinc Co. (Iran Zinc Mine Development Co.)	About 12 kilometers east of Zanjan, Zanjan Province	15
Do.	Bandar Abbas Zinc Production Co. (affiliate of Calcimine Co.)	Bandar Abbas, Hormozgan Province	13

⁶Estimated. Do., do. Ditto. NA Not available.

¹Data were augmented by input from the Iranian National Committee of the World Mining Congress.

²Government owned.

³Recovered from Sarcheshmeh copper plant slimes.

⁴A subsidiary of state-owned Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO).