# IRON ORE[1]

(Data in thousand metric tons of usable ore unless otherwise noted)

**Domestic Production and Use:** In 2021, mines in Michigan and Minnesota shipped 98% of the domestic usable iron ore products, which were consumed in the steel industry in the United States, with an estimated value of $4.3 billion, a 23% increase from $3.5 billion in 2020. The remaining 2% of domestic iron ore was produced for nonsteel end uses. Seven open pit iron ore mines (each with associated concentration and pelletizing plants) and four iron metallic plants—one direct-reduced iron (DRI) plant in Louisiana and three hot-briquetted iron (HBI) plants in Indiana, Ohio, and Texas—operated during the year to supply steelmaking raw materials. The United States was estimated to have produced 1.8% and consumed 1.4% of the world's iron ore output.

| Salient Statistics—United States:[2] | 2017 | 2018 | 2019 | 2020 | 2021[e] |
|---|---|---|---|---|---|
| Production: | | | | | |
| Iron ore | 47,900 | 49,500 | 46,900 | 38,100 | 46,000 |
| Iron metallics | 3,250 | 3,560 | 3,660 | 3,500 | 3,800 |
| Shipments | 46,900 | 50,400 | 47,000 | 38,000 | 44,000 |
| Imports for consumption | 3,720 | 3,790 | 3,980 | 3,240 | 3,900 |
| Exports | 10,600 | 12,700 | 11,400 | 10,400 | 13,000 |
| Consumption: | | | | | |
| Reported | 34,400 | 36,600 | 34,800 | NA | NA |
| Apparent[3] | 40,100 | 41,400 | 39,100 | 31,100 | 36,000 |
| Price, average value reported by mines, dollars per ton | 78.54 | 93.00 | 92.94 | 91.27 | 94.00 |
| Stocks, mine, dock, and consuming plant, yearend | 3,930 | 3,100 | 3,470 | 3,290 | 4,000 |
| Employment, mine, concentrating and pelletizing plant, number | 4,630 | 4,860 | 4,960 | 4,300 | 4,200 |
| Net import reliance[4] as a percentage of apparent consumption | E | E | E | E | E |

**Recycling:** None. See Iron and Steel Scrap.

**Import Sources (2017–20):** Brazil, 55%; Canada, 22%; Sweden, 8%; Russia, 4%; and other, 11%.

| Tariff: Item | Number | Normal Trade Relations 12–31–21 |
|---|---|---|
| Iron ores and concentrates: | | |
| Concentrates | 2601.11.0030 | Free. |
| Coarse ores | 2601.11.0060 | Free. |
| Other ores | 2601.11.0090 | Free. |
| Pellets | 2601.12.0030 | Free. |
| Briquettes | 2601.12.0060 | Free. |
| Sinter | 2601.12.0090 | Free. |
| Roasted iron pyrites | 2601.20.0000 | Free. |

**Depletion Allowance:** 15% (domestic), 14% (foreign).

**Government Stockpile:** None.

**Events, Trends, and Issues:** Significant increases in production, shipments, and trade in 2021 were due to recovery from the effects of the global COVID-19 pandemic, which lowered steel production and consumption globally in 2020. Domestic iron ore production was estimated to be 46 million tons in 2021, a 21% increase from 38.1 million tons in 2020. Total raw steel production was estimated to have increased to 87 million tons in 2021 from 72.7 million tons in 2020. The share of steel produced by basic oxygen furnaces, the process that uses iron ore, continued to decline from 37.3% in 2015 to an estimated 28% in 2021 owing to increased use of electric arc furnaces because of their energy efficiency, reduced environmental impacts, and the ready supply of scrap.

Overall, global prices trended upward to an average unit value of $178.27 per ton in the first 9 months of 2021, a 64% increase from the 2020 annual average of $108.92 per ton and a 90% increase from the 2019 annual average of $93.85 per ton. Based on reported prices for iron ore fines (62% iron content) imported into China (cost, insurance, and freight into Tianjin Port), the highest monthly average price during the first 9 months of 2021 was $214.43 per ton in June compared with the high of $155.43 per ton in December 2020. The lowest monthly average price during the same period in 2021 was $124.52 per ton in September compared with the low of $84.73 per ton in April 2020. The prices trended upward owing to a reduced supply of higher grade iron ore products and demand for higher grade ore to reduce greenhouse gas emissions in steel production.

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One company commenced production at a HBI plant in Ohio in late 2020, making it the fourth iron metallics facility operating in the United States. From 2009 to 2013, no iron metallics plants operated domestically. In December 2020, one iron ore mining company acquired all the domestic iron and steel operations from another company, consolidating all domestic iron ore mines, blast furnaces, and basic oxygen furnace steelmaking mills under the control of two companies. Globally, estimated iron ore production in 2021 increased by 4% from that of 2020. Global finished steel consumption was forecast by the World Steel Association[5] to increase by 4.5% in 2021 and increase by 2.2% in 2022.

**World Mine Production and Reserves:** Reserves for Australia, Peru, and Turkey were revised based on Government and public sources.

| | Mine production | | | | Reserves[6] (million metric tons) | |
|---|---|---|---|---|---|---|
| | Usable ore | | Iron content | | | |
| | 2020 | 2021[e] | 2020 | 2021[e] | Crude ore | Iron content |
| United States | 38,100 | 46,000 | 24,100 | 29,000 | 3,000 | 1,000 |
| Australia | 912,000 | 900,000 | 565,000 | 560,000 | [7]51,000 | [7]25,000 |
| Brazil | 388,000 | 380,000 | 247,000 | 240,000 | 34,000 | 15,000 |
| Canada | 60,100 | 68,000 | 36,100 | 41,000 | 6,000 | 2,300 |
| Chile | 15,600 | 19,000 | 9,890 | 12,000 | NA | NA |
| China | 360,000 | 360,000 | 225,000 | 220,000 | 20,000 | 6,900 |
| India | 204,000 | 240,000 | 127,000 | 150,000 | 5,500 | 3,400 |
| Iran | 49,500 | 50,000 | 32,500 | 33,000 | 2,700 | 1,500 |
| Kazakhstan | 62,900 | 64,000 | 12,700 | 13,000 | 2,500 | 900 |
| Mexico | 14,900 | 17,000 | 9,380 | 11,000 | NA | NA |
| Peru | 13,300 | 16,000 | 8,890 | 11,000 | 2,600 | 1,500 |
| Russia | 100,000 | 100,000 | 69,500 | 71,000 | 25,000 | 14,000 |
| South Africa | 55,600 | 61,000 | 35,400 | 39,000 | 1,000 | 670 |
| Sweden | 35,800 | 40,000 | 25,400 | 28,000 | 1,300 | 600 |
| Turkey | 15,400 | 16,000 | 8,570 | 8,900 | 130 | 38 |
| Ukraine | 78,800 | 81,000 | 49,300 | 51,000 | [8]6,500 | [8]2,300 |
| Other countries | 69,500 | 90,000 | 40,000 | 58,000 | 18,000 | 9,500 |
| World total (rounded) | 2,470,000 | 2,600,000 | 1,520,000 | 1,600,000 | 180,000 | 85,000 |

**World Resources:**[6] U.S. resources are estimated to be 110 billion tons of iron ore containing about 27 billion tons of iron. U.S. resources are mainly low-grade taconite-type ores from the Lake Superior district that require beneficiation and agglomeration prior to commercial use. World resources are estimated to be greater than 800 billion tons of crude ore containing more than 230 billion tons of iron.

**Substitutes:** The only source of primary iron is iron ore, used directly as direct-shipping ore or converted to briquettes, concentrates, DRI, iron nuggets, pellets, or sinter. DRI, iron nuggets, and scrap are extensively used for steelmaking in electric arc furnaces and in iron and steel foundries. Technological advancements have been made that allow hematite to be recovered from tailings basins and pelletized.

[e]Estimated. E Net exporter. NA Not available.

[1]Data are for iron ore used as a raw material in steelmaking unless otherwise noted. See also Iron and Steel and Iron and Steel Scrap.

[2]Except where noted, salient statistics are for all forms of iron ore used in steelmaking and do not include iron metallics, which include DRI, HBI, and iron nuggets.

[3]Defined as production + imports – exports + adjustments for industry stock changes.

[4]Defined as imports – exports + adjustments for industry stock changes.

[5]World Steel Association, 2021, Short range outlook October 2021: Brussels, Belgium, World Steel Association press release, October 14, 8 p.

[6]See Appendix C for resource and reserve definitions and information concerning data sources.

[7]For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 24 billion tons of crude ore and 11 billion tons of contained iron.

[8]For Ukraine, reserves consist of the A and B categories of the Soviet reserves classification system.