

## IRON ORE<sup>1</sup>

(Data in thousand metric tons, usable ore, unless otherwise specified)

**Domestic Production and Use:** In 2023, seven open pit iron ore mines (each with associated concentration and pelletizing plants) in Michigan and Minnesota shipped 98% of domestic usable iron ore products for consumption in the steel industry in the United States. The remaining 2% of domestic iron ore products were consumed in nonsteel end uses. In 2023, the United States produced iron ore with an estimated value of \$7.5 billion, a 22% increase from \$6.2 billion in 2022. 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 with an estimated value of \$2.1 billion. The United States was estimated to have produced 1.6% and consumed 1.4% of the world's iron ore output.

<b><u>Salient Statistics—United States:</u></b>	<b><u>2019</u></b>	<b><u>2020</u></b>	<b><u>2021</u></b>	<b><u>2022</u></b>	<b><u>2023<sup>e</sup></u></b>
Production:					
Iron ore	46,900	38,100	47,500	39,000	44,000
Iron metallics	3,660	3,500	5,010	5,240	5,300
Shipments	47,000	38,000	43,400	39,000	45,000
Imports for consumption	3,980	3,240	3,750	3,040	3,500
Exports	11,400	10,400	14,400	11,400	11,000
Consumption:					
Reported	34,800	NA	NA	NA	NA
Apparent <sup>2</sup>	39,100	31,100	37,000	30,600	36,000
Price, average unit value reported by mines, dollars per metric ton	92.94	91.27	141.78	156.42	170
Stocks, mine, dock, and consuming plant, yearend	3,470	3,290	3,170	3,190	3,500
Employment, mine, concentrating and pelletizing plant, number	4,960	4,300	4,980	4,790	4,900
Net import reliance <sup>3</sup> as a percentage of apparent consumption	E	E	E	E	E

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

**Import Sources (2019–22):** Brazil, 53%; Canada, 23%; Sweden, 9%; Bahrain, 4%; and other, 11%.

<b><u>Tariff:</u></b>	<b><u>Item</u></b>	<b><u>Number</u></b>	<b><u>Normal Trade Relations</u></b> <b><u>12–31–23</u></b>
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:** Iron ore production and trade in 2023 were estimated to have increased likely owing to restocking and increased consumption for intermediate products. Domestic iron ore production was estimated to be 44 million tons in 2023, a 13% increase from 39 million tons in 2022. Pig iron production increased by 6% but total raw steel production was estimated to have remained essentially unchanged at 80 million tons in 2023 from 80.5 million tons in 2022. The World Steel Association<sup>4</sup> forecast global finished steel consumption to increase by 1.8% in 2023 and increase by 1.9% in 2024. Global end-use consumption of steel products was expected to increase slightly in 2023 owing to government measures to address inflation and infrastructure concerns, despite concurrent events affecting consumer demand, including the conflict in Ukraine, global inflation, and rising energy costs and interest rates.

Overall, global prices trended downward to an average year-to-date unit value of \$117.76 per ton in the first 9 months of 2023, an 8% decrease from the 2022 average year-to-date unit value of \$128.65 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 2023 was \$128.37 per ton in March compared with the high of \$152.07 per ton in March 2022. The lowest monthly average price during the same period in 2023 was \$105.15 per ton in May compared with the low of \$99.81 per ton in September 2022.

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In April, one company restarted production, at a limited capacity, at a domestic mine that was idled in 2022, citing increases in steel production and attributing the plant as a “swing operation” to fill needed capacity. In May, one company received approval for State mineral leases that were expected to supplement iron ore for a domestic mine formerly anticipated to idle in 2025 and extend the mine life for an additional 20 years. In July, one iron ore and steel producer announced that it had made an offer to acquire 100% of the outstanding stock of its sole competitor in the domestic iron ore market, which rejected the offer. The purchase would have consolidated all domestic iron ore production under one company. In multiple announcements, the two iron ore companies in the United States made multiple improvements to processing, ran successful test trials for alternative fuel sources, and modified processes for efficiencies aimed at decreasing greenhouse gas emissions.

**World Mine Production and Reserves:** Reserves for Australia, Iran, South Africa, Turkey, and the United States were revised based on company and Government reports.

	Mine production				Reserves <sup>5</sup>	
	Usable ore		Iron content		(million metric tons)	
	<u>2022</u>	<u>2023<sup>e</sup></u>	<u>2022</u>	<u>2023<sup>e</sup></u>	<u>Crude ore</u>	<u>Iron content</u>
United States	39,000	44,000	24,700	28,000	3,100	1,300
Australia	944,000	960,000	584,000	590,000	<sup>6</sup> 58,000	<sup>6</sup> 27,000
Brazil	435,000	440,000	276,000	280,000	34,000	15,000
Canada	69,000	70,000	41,400	42,000	6,000	2,300
Chile	17,700	18,000	11,100	11,000	NA	NA
China	272,000	280,000	170,000	170,000	20,000	6,900
India	251,000	270,000	156,000	170,000	5,500	3,400
Iran	78,300	77,000	51,300	50,000	3,300	1,500
Kazakhstan	53,600	53,000	8,890	8,800	2,500	900
Mauritania	12,700	13,000	7,950	8,100	NA	NA
Mexico	10,800	12,000	6,800	7,600	NA	NA
Peru	19,300	19,000	12,900	13,000	2,600	1,200
Russia	84,200	88,000	55,800	58,000	29,000	14,000
South Africa	63,700	61,000	40,500	39,000	990	620
Sweden	38,900	38,000	27,700	27,000	1,300	600
Turkey	17,700	17,000	10,700	10,000	152	99
Ukraine	34,100	36,000	21,300	22,000	<sup>7</sup> 6,500	<sup>7</sup> 2,300
Other countries	<u>57,200</u>	<u>48,000</u>	<u>32,200</u>	<u>27,000</u>	<u>18,000</u>	<u>9,500</u>
World total (rounded)	2,500,000	2,500,000	1,540,000	1,500,000	190,000	87,000

**World Resources:**<sup>5</sup> 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.

<sup>e</sup>Estimated. E Net exporter. NA Not available.

<sup>1</sup>Data are for iron ore used as a raw material in steelmaking—excluding iron metalics such as DRI, HBI, and iron nuggets—unless otherwise specified. See also the Iron and Steel and Iron and Steel Scrap chapters.

<sup>2</sup>Defined as production + imports – exports ± adjustments for industry stock changes.

<sup>3</sup>Defined as imports – exports ± adjustments for industry stock changes.

<sup>4</sup>Source: World Steel Association, 2023, Short range outlook October 2023: Brussels, Belgium, World Steel Association press release, October 17, 7 p.

<sup>5</sup>See Appendix C for resource and reserve definitions and information concerning data sources.

<sup>6</sup>For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 23 billion tons of crude ore and 10 billion tons of iron content.

<sup>7</sup>For Ukraine, reserves consist of the A and B categories of the Soviet reserves classification system.