

IRON ORE¹(Data in million metric tons of usable ore² unless noted)

Domestic Production and Use: In 2007, mines in Michigan and Minnesota shipped 95% of the usable ore produced, with an estimated value of greater than \$3.1 billion. Twelve iron ore mines—11 open pits and 1 dredging operation—8 concentration plants, and 8 pelletizing plants operated during the year. Almost all ore was concentrated before shipment. Eight of the mines operated by three companies accounted for virtually all of the production. The United States produced and consumed about 3% of the world's iron ore output.

Salient Statistics—United States:	2003	2004	2005	2006	2007^e
Production, usable	48.6	54.7	54.3	52.7	52.0
Shipments	46.1	54.9	53.2	52.7	49.0
Imports for consumption	12.6	11.8	13.0	11.5	9.0
Exports	6.8	8.4	11.8	8.3	9.0
Consumption:					
Reported (ore and total agglomerate) ³	61.6	64.5	60.1	58.2	56.0
Apparent	55.2	^e 57.9	^e 56.6	^e 57.4	52.0
Price ⁴ , U.S. dollars per metric ton	32.30	37.92	44.50	53.88	63.00
Stocks, mine, dock, and consuming plant, yearend, excluding byproduct ore ⁵	17.5	^e 17.6	^e 16.5	^e 15.1	15.0
Employment, mine, concentrating and pelletizing plant, quarterly average, number	4,670	4,410	4,450	4,470	4,470
Net import reliance ⁶ as a percentage of apparent consumption (iron in ore)	12	6	4	8	—

Recycling: None (see Iron and Steel Scrap section).

Import Sources (2003-06): Canada, 55%; Brazil, 38%; Chile, 2%; Trinidad & Tobago, 1%; and other, 4%.

Tariff: Item	Number	Normal Trade Relations 12-31-07
Concentrates	2601.11.0030	Free.
Coarse ores	2601.11.0060	Free.
Fine ores	2601.11.0090	Free.
Pellets	2601.12.0030	Free.
Briquettes	2601.12.0060	Free.
Sinter	2601.12.0090	Free.

Depletion Allowance: 15% (Domestic), 14% (Foreign).

Government Stockpile: None.

Events, Trends, and Issues: Following a year of almost 20% increase in worldwide price for lump and fines in 2006, increases of almost 10% in 2007 have resulted from a continuing supply deficit. Pellet prices in 2007 rebounded with an increase of greater than 5% following a slight decrease in 2006.

Major iron-ore-mining companies continue to reinvest profits in mine development, but increases in capacity have not been keeping up with the demand growth, which is dominated by China. In 2006, it is estimated that China increased production of mostly lower grade ores by about 40%. Estimates of Chinese imports of higher grade ores, mostly from Australia and Brazil, show an increase of about 15% compared with those of 2006, a slowdown from the 19% growth rate between 2005 and 2006.

International iron ore trade and production of iron ore and pig iron—key indicators of iron ore consumption—clearly show that iron ore consumption in China is the major factor upon which the expansion of the international iron ore industry depends. China has become more active in pursuing overseas joint ventures, increased iron ore imports, and expanded domestic production of low-grade ores—all of which indicate continued growth of iron ore consumption.

In 2007, India's Essar Global Limited reached an agreement to acquire Algoma Steel Inc. of Canada for \$1.64 billion. Three days later, Essar announced plans to acquire Minnesota Steel Industries, LLC. Essar planned to take advantage of synergies between Algoma, a manufacturer of rolled steel products, based in Sault Ste. Marie, Ontario, and Minnesota Steel, a company currently planning a mine, ore-processing facility, direct reduction works, and steel slab-making facilities on Minnesota's Mesabi Range.⁷

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Owing to increased prices and interest by Chinese importers, the opening or reopening of several lower grade iron ore deposits has been investigated during the past few years by small capitalization miners in Alaska, Arizona, Missouri, Nevada, New Mexico, and Utah.

Permitting and financing activities for a direct-reduced iron nugget plant—the Mesabi Nugget project—progressed during 2005 and into 2006. Expanded efforts to locate a plant to produce these 96%-to-98% iron-content nuggets in Michigan were begun in 2007.

Increased operating costs have been offsetting operational improvements in the U.S. iron ore industry. Fuel costs are substantially higher than originally projected in the fuel-intensive iron ore industry. Other production costs, such as transportation, have also increased, and the availability of capital equipment and skilled labor has been reduced by increased demand for these resources, as the worldwide mining boom continues.

World Mine Production, Reserves, and Reserve Base: The mine production estimates for China are based on crude ore, rather than usable ore, which is reported for the other countries. The iron ore reserve estimates for Australia and Brazil and the reserve base estimate for Brazil have been revised based on new information from those countries.

	Mine production		Crude ore		Iron content	
	2006	2007 ^e	Reserves ⁸	Reserve base ⁸	Reserves ⁸	Reserve base ⁸
United States	53	52	6,900	15,000	2,100	4,600
Australia	275	320	16,000	45,000	10,000	28,000
Brazil	318	360	16,000	27,000	8,900	14,000
Canada	34	33	1,700	3,900	1,100	2,500
China	588	600	21,000	46,000	7,000	15,000
India	140	160	6,600	9,800	4,200	6,200
Iran	20	20	1,800	2,500	1,000	1,500
Kazakhstan	19	23	8,300	19,000	3,300	7,400
Mauritania	11	11	700	1,500	400	1,000
Mexico	11	12	700	1,500	400	900
Russia	102	110	25,000	56,000	14,000	31,000
South Africa	41	40	1,000	2,300	650	1,500
Sweden	23	24	3,500	7,800	2,200	5,000
Ukraine	74	76	30,000	68,000	9,000	20,000
Venezuela	23	20	4,000	6,000	2,400	3,600
Other countries	67	70	11,000	30,000	6,200	17,000
World total (rounded)	1,800	1,900	150,000	340,000	73,000	160,000

World Resources: World resources are estimated to exceed 800 billion tons of crude ore containing more than 230 billion tons of iron. U.S. resources are estimated to be about 110 billion tons of 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 for commercial use.

Substitutes: Iron ore, used directly, as lump ore, or converted to briquettes, concentrates, pellets, or sinter, is the only source of primary iron. In some operations, ferrous scrap may constitute as much as 7% of the blast furnace feedstock. Scrap is extensively used in steelmaking in electric arc furnaces and in iron and steel foundries, but availability of scrap can become an issue in any given year. In general, price increases for iron ore were 9.5% for lump and fine ores during the past year, and a 5.3% increase for pellets with some premium for shorter transport. The margin between iron ore and scrap import prices continued to decrease between 2004 and 2006, but has remained level for 2007; therefore, the relative attractiveness of scrap compared to iron ore has not changed since 2006.

^eEstimated.

¹See also Iron and Steel and Iron and Steel Scrap.

²Agglomerates, concentrates, direct-shipping ore, and byproduct ore for consumption.

³Includes weight of lime, flue dust, and other additives in sinter and pellets for blast furnaces.

⁴Estimated from reported value of ore at mines.

⁵Information regarding consumer stocks at receiving docks and plants was not available after 2003 (these stock changes were estimated).

⁶Defined as imports – exports + adjustments for Government and industry stock changes.

⁷Jorgenson, J.D., 2007, Iron ore in April 2007: U.S. Geological Survey Mineral Industry Surveys, July, 6 p.

⁸See Appendix C for definitions.