

**IRON ORE<sup>1</sup>**(Data in million metric tons of usable ore<sup>2</sup> unless otherwise noted)

**Domestic Production and Use:** In 2011, mines in Michigan and Minnesota shipped 99% of the usable ore produced in the United States, with an estimated value of \$6.0 billion. Thirteen iron ore mines (11 open pits, 1 reclamation operation, and 1 dredging operation), 9 concentration plants, and 9 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 was estimated to have produced and consumed 2% of the world's iron ore output.

<b>Salient Statistics—United States:</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011<sup>e</sup></b>
Production, usable	52.5	53.6	26.7	49.9	54
Shipments	50.9	53.6	27.6	50.6	52
Imports for consumption	9.4	9.2	3.9	6.4	5
Exports	9.3	11.1	3.9	10.0	10
Consumption:					
Reported (ore and total agglomerate) <sup>3</sup>	54.7	51.9	31.0	42.3	49
Apparent <sup>e</sup>	52.1	49.7	25.7	48.0	48
Price, <sup>4</sup> U.S. dollars per metric ton	59.64	70.43	92.80	98.80	120.00
Stocks, mine, dock, and consuming plant, yearend, excluding byproduct ore <sup>e, 5</sup>	15.8	17.7	18.7	17.2	18
Employment, mine, concentrating and pelletizing plant, quarterly average, number	4,450	4,770	3,530	4,780	5,260
Net import reliance <sup>6</sup> as a percentage of apparent consumption (iron in ore)	E	E	E	E	E

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

**Import Sources (2007–10):** Canada, 66%; Brazil, 22%; Russia, 3%; Chile, 3%; and other, 6%.

<b>Tariff:</b> Item	<b>Number</b>	<b>Normal Trade Relations</b>
		<b>12-31-11</b>
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 an almost 30% decrease in the worldwide price for iron ore fines sold in the European market and an almost one-third decrease for fines from Australia sold in the Asian market in 2009, both owing to the global economic downturn, the global benchmarking system for the sale of iron ore ceased in 2010. April 2010 marked the end of the 40-year global benchmarking system for the sale of iron ore under annual contract. Iron ore producers felt that they had been losing out when some customers reneged on contract tonnages when spot price fell below the contract price. The major producers reached agreements with several customers to move to shorter term or quarterly contracts (based on 3 months—starting the previous quarter minus 1 month). U.S. prices in 2010 did not follow the adjustment in world prices and actually increased. U.S. domestic prices continued to increase in 2011, following a general upward trend in world prices.

Major iron-ore-mining companies continue to reinvest profits in mine development, but increases in production capacity may outstrip expected consumption within the next few years, as economic growth, dominated by China, is expected to slow. In 2010, it was estimated that China increased production (of mostly lower grade ores) by 22% from that of the previous year—significantly higher than the 7% increase seen between 2008 and 2009 and somewhat higher than the 17% increase seen between 2007 and 2008. Estimates of Chinese imports of higher grade ores in 2010 (more than 80% from Australia, Brazil, and India) showed a slight decrease compared with those of 2009—the first decrease in more than a decade.

## IRON ORE

In 2010, China imported almost 60% of the world's total iron ore exports and produced about 60% of the world's pig iron. Since international iron ore trade and production of iron ore and pig iron are key indicators of iron ore consumption, this demonstrates that iron ore consumption in China is the primary factor upon which the expansion of the international iron ore industry depends. The world iron ore market should continue to be tight with demand exceeding supply until at least 2015 owing to the long lead time required to bring mines into production, a world shortage of skilled labor, and growing natural resource nationalism.

The Mesabi Nugget project—a direct-reduced iron nugget plant—was completed in Minnesota in the fourth quarter of 2009 and continued to ramp up production in 2011. The \$270 million plant produces 96%-to-98% iron-content nuggets. Plans are being made to reopen an iron ore pit adjacent to the nugget plant. A \$1.6-billion project to produce steel slab was also underway on the Mesabi Range in Minnesota. A taconite pellet plant, direct-reduced iron plant, and steelmaking facilities are planned for operation and all are planned to be completed by 2015.

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

	Mine production		Reserves <sup>7</sup>	
	2010	2011 <sup>e</sup>	Crude ore	Iron content
United States	50	54	6,900	2,100
Australia	433	480	35,000	17,000
Brazil	370	390	29,000	16,000
Canada	37	37	6,300	2,300
China	1,070	1,200	23,000	7,200
India	230	240	7,000	4,500
Iran	28	30	2,500	1,400
Kazakhstan	24	24	3,000	1,000
Mauritania	11	11	1,100	700
Mexico	14	14	700	400
Russia	101	100	25,000	14,000
South Africa	59	55	1,000	650
Sweden	25	25	3,500	2,200
Ukraine	78	80	6,000	2,100
Venezuela	14	16	4,000	2,400
Other countries	48	50	12,000	6,000
World total (rounded)	2,590	2,800	170,000	80,000

**World Resources:** U.S. resources are estimated to be about 27 billion tons of iron contained within 110 billion tons of ore. 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 exceed 230 billion tons of iron contained within greater than 800 billion tons of crude ore.

**Substitutes:** The only source of primary iron is iron ore, used directly, as lump ore, or converted to briquettes, concentrates, pellets, or sinter. At some blast furnace 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 scrap availability can be an issue in any given year. In general, large price increases for lump and fine iron ores and iron ore pellets through mid-2009 were commensurate with price increases in the alternative—scrap. The ratio of the U.S. import price of scrap to the U.S. import price of iron ore decreased in 2011, causing the relative attractiveness of scrap compared to iron ore to increase to levels similar to those of 2009. The ratio of imported scrap to imported iron ore price in 2011 is the lowest it has been in the past decade.

<sup>e</sup>Estimated. E Net exporter.

<sup>1</sup>See also Iron and Steel and Iron and Steel Scrap.

<sup>2</sup>Agglomerates, concentrates, direct-shipping ore, and byproduct ore for consumption.

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

<sup>4</sup>Estimated from reported value of ore at mines.

<sup>5</sup>Information regarding consumer stocks at receiving docks and plants has not been available since 2003 (stock changes for 2006–10 were estimated).

<sup>6</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>7</sup>See Appendix C for resource/reserve definitions and information concerning data sources.

\*Correction posted on February 27, 2012.