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IRON AND STEEL

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Iron and Steel

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The global economy remained strong during 2006, with the gross domestic product (GDP) growing an estimated 3.9% after a decline of 3.5% during 2005, compared with that of 2004, according to the World Bank. The U.S. GDP grew during 2006 at a rate of 3.2% (World Bank, The, 2007b).

Global raw steelmaking capacity rose to more than 1.3 billion metric tons (Gt) in 2006 from 1.2 Gt in 2004, according to the Organisation for Economic Cooperation and Development (OECD) (Yahoo! India Business News, 2007). U.S. raw steelmaking capacity in 2006 was about 112 million metric tons (Mt) (American Iron and Steel Institute, 2006, p. 75). U.S. apparent steel consumption, an indicator of economic growth, increased to 120 Mt in 2006 from 113 Mt (revised) in 2005.

Mittal Steel Co., the largest steel company in the world, valued at $18 billion with an annual capacity of 58 Mt and projected annual revenue of $32 billion, succeeded in absorbing its closest rival, Arcelor SA of Luxembourg, on January 27, 2006. Mittal thus controlled an estimated 11% of the world's annual raw steel output and produced more than 91 million tons per year (Mt/yr) of steel. Mittal's North American steelmaking capacity comprised 21 mills, 17 of which were in the United States. Mittal may signify the future of the world steel industry, which would consist of international consolidations that result in several very large, high-capacity companies offering a wide range of products, having global buying power, and maintaining their own raw materials security.

The American Iron and Steel Institute (AISI) reported U.S. production of iron and steel and shipments of steel mill products. These data can be regarded as representing 100% of the raw steel producers in the United States. World production of iron and steel is reported by the International Iron and Steel Institute (IISI) and by foreign government agencies. Consistent with international usage and Federal Government policy, the U.S. Geological Survey reported all data on iron and steel in metric units unless otherwise noted.

Environment

The United States, the State of Ohio, and two citizen groups reached a settlement with AK Steel Corporation resolving claims that discharges from AK Steel's Middletown, OH, steel plant posed a threat to human health and the environment, and violated Federal and State environmental statutes and regulations (U.S. Department of Justice, 2006). AK Steel committed to clean up PCB-contaminated sediments from two tributary streams to the Great Miami River and to remove contaminated soils from adjacent floodplain areas. The company would also perform a comprehensive assessment of other releases of contaminants from the steel plant and evaluate cleanup alternatives. AK Steel estimated that the work would require a settlement cost of approximately $12 million to $13 million. AK Steel would also comply with specified requirements of the Clean Air Act and Clean Water Act and pay a civil penalty of $460,000. An additional $750,000 would be spent on an environmentally beneficial project that would remove ozone–depleting refrigerants from certain equipment at the Middletown plant.

The Kyoto Protocol, an agreement made under the United Nations Framework Convention on Climate Change, targeted reduction of greenhouse gases by the United States. For the U.S. steel industry, Kyoto target reduction of greenhouse gases has been exceeded by more than 400%, primarily owing to the growth of electric arc furnaces (EAFs) (Danjczek, 2007, p. 8). EAFs generate one-third to one-fourth of the greenhouse gases emitted by integrated steel plants having blast furnaces and basic oxygen furnaces. Greenhouse gas emissions throughout the United States in 2006 were 37% below the levels established by the Kyoto Protocol in 1990; the United States was not a signatory to the Kyoto Protocol (Danjczek, 2007, p. 8).

Almost 68 million mercury-bearing switches were in vehicles in the United States, which when shredded and recycled in electric arc furnaces, would release mercury into the atmosphere if the switches were not removed prior to melting. Steelmakers and vehicle makers agreed to remove 4 million switches from vehicles before they are scrapped during the subsequent 3 years (Eilperin, 2006). The program was expected to reduce the country's annual mercury pollution by at least 5% during the following 15 years. Prior to this agreement, 10 States—Arkansas, Illinois, Iowa, Maine, Massachusetts, New Jersey, North Carolina, Rhode Island, South Carolina, and Utah—adopted programs to remove these switches.

Production

Raw steel production in the United States increased by 3.5% to 98.2 Mt in 2006 from 94.9 Mt in 2005 (table 1; American Iron and Steel Institute, 2006, p. 75). The AISI estimated raw steel production capability to be 112 Mt, up from 108 Mt in 2005. Production represented 87.5% of estimated capacity, the same as in 2005.

Integrated steel producers smelted iron ores to liquid iron in blast furnaces and used basic oxygen furnaces to refine this iron with some scrap to produce raw liquid steel. The basic oxygen process was used to make 42.1 Mt of steel in the United States (American Iron and Steel Institute, 2006, p. 72). The use of this process increased to 57.1% of total steel production in 2006 from 45.0% in 2005. Blast furnace operations in the United States were run by 9 companies at 16 locations (Steel Business Briefing, Ltd., 2007, p. 28).

Minimills and specialty mills are nonintegrated steel producers that use EAF to melt low-cost raw materials (usually scrap).

They also employ continuous casting machines and hot-rolling mills that are often closely coupled to the casting operation. Specialty mills include producers of stainless, alloy-electrical, and tool steel; high-temperature alloys; forged ingots; and other low-volume steel products. In the United States, 47 companies operated 98 EAF plant facilities. These U.S. mills used the EAF steelmaking process to produce 56.1 Mt of steel, a 7.7% increase from that in 2005, and accounted for 42.9% of total steelmaking (American Iron and Steel Institute, 2006, p. 73).

Raw liquid steel is mostly cast into semifinished products in continuous casting machines. Only 3.2% of U.S. production was cast in ingot form and subsequently rolled into semifinished forms; this represented about the same percentage as that of 2005. Continuous casting production was 95.0 Mt, or 96.8% of total steel production, about the same as in 2005 (American Iron and Steel Institute, 2006, p. 73).

Consumption

Steel mill products are produced at steel mills either by forging or rolling into forms normally delivered for fabrication or use. Some companies purchase semifinished steel mill products from other steel companies and use them to produce finished steel products. To avoid double counting steel mill product shipments under these circumstances, steel mills identify any shipments of steel mill products to other companies that are reporters of steel mill product shipments. The accumulated shipments of all companies less the shipments to other reporting companies are identified as net shipments.

The U.S. apparent consumption of steel mill products was 120 Mt, a 6% increase from that in 2005. Shipments of steel mill products by U.S. companies increased by 4.3% to 99.3 Mt compared with those of 2005 (American Iron and Steel Institute, 2006, p. 25). Shipments to domestic customers increased by 4.3% during 2006 (American Iron and Steel Institute, 2006, p. 29). Compared with shipments in 2005, shipments of construction and contractors' products, the largest single end-use market, decreased by 13% in 2006; automotive product shipments increased by 7.3% in 2006; lumbering, mining, oil and gas, and quarrying industries shipments decreased by 16%; shipments of industrial and agricultural machinery, equipment, and tools were about the same; shipments of appliances and containers, packaging, and shipping material; and steel service center shipments, were about the same.

Prices

The U.S. Department of Labor, Bureau of Labor Statistics, producer price index for steel mill products was up by 9% to 174.1 for 2006 from 159.7 in 2005 (1982 base=100) (table 1) (U.S. Department of Labor, Bureau of Labor Statistics, 2007).

Foreign Trade

Export shipments by AISI reporting companies increased to 8.8 Mt from 8.5 Mt in 2005 (American Iron and Steel Institute, 2006, p. 38). Canada received the largest amount of U.S. exported steel, 5.5 Mt, 4.1% more than in 2005. Mexico was again the second leading importer, receiving 2.0 Mt, up from 1.7 Mt in 2005. Imports of steel mill products increased by 41% to 41 Mt from 29 Mt in 2005. Brazil, Canada, China, the European Union (EU), Germany, Japan, the Republic of Korea, Mexico, Russia, and Turkey were major sources of steel mill product imports (table 4).

U.S. indirect steel imports hit a new high of 36.1 Mt in 2006—up 8% from that of 2005 and up 22% since 2000 (American Iron and Steel Institute, 2007). Also, U.S. indirect exports of steel reached a new high of 18.7 Mt in 2006, a 2% gain from those of 2005, and up 15% from the 2000 figure. The indirect steel trade deficit increased to an estimated 17.4 Mt in 2006. This was 15% greater than that of 2005 and only 4% below the record year of 2002. On a country basis, the largest deficits were with China and Japan, at 5.0 and 4.9 Mt, respectively. Of particular concern to domestic steelmakers was that U.S. indirect steel imports from China in 2006 (5.5 Mt) increased 20% from the level in 2005. Moreover, the U.S. indirect steel trade deficit of 5.0 Mt with China in 2006 was the largest deficit with any country, and was 3.5 Mt greater than in 1999. It had been reported that China has the world's most heavily subsidized steel industry and a huge excess of inefficient steelmaking capacity, making it extremely difficult for any U.S. manufacturer, regardless of how efficient, to compete (American Iron and Steel Institute, 2007).

Earlier, the AISI, Canadian Steel Producers Association, Mexican Steel Producers Association, Specialty Steel Industry of North America, and Steel Manufacturers Association made a joint statement about how China's economic strategy constituted the greatest economic and security challenge facing North America (American Iron and Steel Institute, 2005). These associations, located in North American Free Trade Agreement countries, agree, in part, on the following allegations: "(1) Existing trade laws remain underutilized, are inadequately enforced and should be strengthened in the context of addressing unfair and disruptive imports of manufactured goods from China; (2) China continues to derive major artificial competitive advantages from its highly undervalued currency, extensive government subsidies, failure to protect intellectual property rights, denial of fundamental worker rights, and lack of environmental controls; (3) China's currency, subsidies and other unfair trade practices are causing significant harm to competitive U.S. and North American manufacturers; (4) China remains a nonmarket economy, and continues to violate many of its WTO commitments; (5) China's economic strategy focuses on the strategic accumulation of productive capacity, export-led growth, and long-term access to raw materials and energy resources; and (6) China's economic strategy has important national security implications for the United States and North America as a whole."

Imports of semifinished steel (table 6) by steel companies must be taken into consideration in evaluating apparent consumption (supply) of steel mill products in the United States and the share of the market represented by imported steel. To avoid double counting the imported semifinished steel and the products produced from it, the amount of semifinished steel consumed by companies that also produced raw steel must be subtracted from domestic consumption. Between 1993 and 2006, semifinished steel imports were in a range between 2.5 Mt/yr and 8.5 Mt/yr. Prior to 1993, the amount was less than 0.2

Mt/yr. Taking the imported semifinished steel into consideration, the share of the U.S. steel market represented by imported steel was an estimated 27% in 2005 compared with 28% in 2004.

Regarding the reporting of imports and exports, "fabricated steel products" are produced from steel mill products but do not include products that incorporate steel products with other materials. Examples of fabricated steel products are fabricated structural steel and steel fasteners. "Other iron and steel products" refers to products that are not produced from steel mill products. Examples of other iron and steel products include iron or steel castings and direct reduced iron (DRI).

World Review

World production of pig iron totaled about 866 Mt, 9% more than that of 2006 (table 9). The pig iron production of the European Union (EU) was about 110 Mt, about a 3% increase since 2005. Germany was the top producer in the EU, producing about 30 Mt, 5.2% greater than in 2005. China continued to be the leading producer of pig iron in the world, producing more than 404 Mt, 17% more than that of 2005. Japan, Russia, and the United States followed with 84 Mt, 52 Mt, and 38 Mt, respectively. The Republic of Korea's production increased slightly. Russia and Ukraine were the only major pig iron producers in the Commonwealth of Independent States (CIS). In North America, the only major producer of pig iron was the United States, where production increased 2% from that in 2005. In South America, the only major pig iron producer was Brazil, producing about 35 Mt. India's production increased 2% above that of 2005.

World capacity for DRI production was estimated to be more than 57 Mt/yr (Midrex Technologies, Inc., 2007). DRI production worldwide was about 59.1 Mt, a 4.6% increase from 56.5 Mt (revised) of 2005. The leading producer of DRI was India, followed by, in descending order of tonnage, Venezuela, Iran, and Mexico (table 9). In 2006, additional DRI capacity of almost 13 Mt/yr was under construction in Iran, Malaysia, Oman, Qatar, Russia, Saudi Arabia, and the United Arab Emirates. The leading technology was the Midrex process, followed by the HYL I and the HYL III processes.

World production of raw steel was 1.17 Gt, an increase from 1.10 Gt (revised) produced during 2005 (table 10). As in previous years, production varied widely among major regions of the world. Asian countries produced about 53% of the world's steel; the EU, 16%; North America, 11%; and the CIS, 10%. During 2006, China was again the world's leading steel producer, exceeding 419 Mt, a gain of 19% compared with that of 2005. In descending order, the leading producers behind China were Japan, the United States, Russia, the Republic of Korea, and Germany. These six countries accounted for 68% of world production. The combined steel production of the six steel-producing countries in the CIS was about 122 Mt, an increase of 5.7% from that in 2005. Russia and Ukraine remained the top producers in the CIS (table 10).

Outlook

The GDP growth may be considered a predictor of the health of the steelmaking and steel manufacturing industries, worldwide and domestically. The global economy was projected to grow by 5.2% in 2007 and 4.8% in 2008, according to the International Monetary Fund (IMF) (International Monetary Fund, 2007). The U.S. GDP was projected to increase 2.1% in 2007 and 3.0% in 2008, according to the World Bank (World Bank, The, 2007a); although the IMF expected the U.S. GDP to grow by only 1.9% in 2008 (International Monetary Fund, 2007). The IMF expected the economy of China to grow by 10% in 2008, after growth of 10.4% in 2007, as estimated by the World Bank.

The global steel industry was expected to have another strong year during 2007, with apparent steel use rising 6.8% during 2007 and 2008, according to the IISI (International Iron and Steel Institute, 2007). Brazil, Russia, India, and China (BRIC countries), which accounted for about 41% of global steel demand in 2006, were expected to increase apparent steel use by 12.8% in 2007 and 11.1% in 2008. The BRIC countries were anticipated to account for 77% of global apparent steel use in 2007 and 71% in 2008.

High demand and high prices for steel since 2004 have helped facilitate consolidation in the steelmaking industry, especially the acquisition of Arcelor SA by Mittal Steel Co. Nevertheless, the industry continued to be highly fragmented, with the 10 largest producers accounting for just 30% of total world production. Industry consolidation was expected to continue as financially strong companies have the resources to explore mergers and acquisitions, according to the OECD (Yahoo! India Business News, 2007).

The OECD forecast that global raw steelmaking capacity would increase to more than 1.44 billion metric tons per year (Gt/yr) in 2007 from 1.40 Gt/yr in 2005 (Organisation for Economic Cooperation and Development, 2005). China accounted for most of this increase—449 Mt in 2007 from 431 Mt in 2006.

While the IISI predicted that global steel production may reach 1.44 Gt in 2008, economic activity in China, the world's leading steel producer, continued to be an important influence on the world economy and steel markets. China's steel production was 419 Mt in 2006, an increase from 353 Mt in 2005, and would reach an estimated 482 Mt in 2007 (International Iron and Steel Institute, 2007).

Global consumption of finished steel products was estimated to increase 6.8% to 1,279 Mt in 2008 from 1,198 Mt in 2007. Consumption in the United States was expected to increase in 2007 by 6.0%, and increase in 2008 by 3.8%; in the EU to increase 3.9% and 1.5%, respectively; in Russia and Ukraine to increase 25% and 17%, and 9.3% and 9.0%, respectively; and in India to increase 14% and 12%, respectively. China's steel-product consumption was expected to be 398 Mt, 33% of world consumption in 2007 (International Iron and Steel Institute, 2007).

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TABLE 1
SALIENT IRON AND STEEL STATISTICS[1]

(Thousand metric tons unless otherwise specified)

	2002	2003	2004	2005	2006
United States:					
Pig iron:					
Production[2]	40,200	40,600	42,300	37,200	37,900
Exports[3]	34	86	48	51	813
Imports for consumption[3]	4,620	3,890	6,400	6,030	6,730
Direct-reduced iron:					
Production[4]	470	210	180	220	240
Exports[3]	1	5	13	--	(5)
Imports for consumption[3]	2,010	1,940	2,450	2,170	2,610
Raw steel production:[6]					
Carbon steel	83,700	86,100	90,700	85,900	89,500
Stainless steel	2,180	2,220	2,400	2,240	2,460
All other alloy steel	5,680	5,350	6,560	6,710	6,190
Total	91,600	93,700	99,700	94,900	98,200
Capability utilization, percent	88.8	84.9	94.6	87.5	87.5
Steel mill products:					
Net shipments[2]	90,700	96,100	101,000	95,200	99,300
Exports[2]	5,450	7,460	7,200	8,520	8,830
Imports[2]	29,600	21,000	32,500 r	29,100 r	41,100
Producer price index (1982=100.0)[7]	104.8	109.5	147.2	159.7 r	174.1
World production:[8]					
Pig iron	608,000 r	667,000 r	711,000 r	794,000 r	866,000 e
Direct-reduced iron[4]	44,600 r	47,200 r	52,600 r	56,500 r	59,100 e
Raw steel	907,000 r	974,000 r	1,060,000 r	1,100,000 r	1,170,000 e

eEstimated. rRevised. -- Zero.

[1]Data are rounded to no more than three significant digits, except producers price index; may not add to totals shown.

[2]Data are from the American Iron and Steel Institute (AISI).

[3]Data are from the U.S. Census Bureau.

[4]Data are from Midrex Technologies, Inc., government, and companies.

[5]Less than ½ unit.

[6]Raw steel is defined by AISI as steel in the first solid state after melting, suitable for rolling.

[7]Data are from the U.S. Department of Labor, Bureau of Labor Statistics.

[8]Data are from the U.S. Geological Survey and the International Iron and Steel Institute.

TABLE 2
MATERIALS CONSUMED IN BLAST FURNACES AND PIG IRON PRODUCED[1]

(Thousand metric tons)

Material	2005	2006
Iron oxides:[2]		
Ores	34	36
Pellets	50,100	49,300
Sinter[3]	8,200	6,990
Total	58,300	56,400
Scrap[4]	1,390 r	2,510
Coke[2]	13,800	14,700
Pig iron, produced	37,200	37,900

rRevised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]American Iron and Steel Institute.

[3]Includes sintered ore and pellet fines, dust, mill scale, and other revert iron-bearing materials; also some nodules.

[4]Mainly briquetted turnings and borings, shredded scrap, etc.; scrap produced at blast furnaces and remelt not included.

TABLE 3

DISTRIBUTION OF SHIPMENTS OF STEEL MILL PRODUCTS, BY STEEL TYPE, PRODUCT, AND MARKET[1]

	Quantity (thousand metric tons)		Percentage	
	2005	2006	2005	2006
Shipments by steel type:				
Carbon steel	88,800	92,700	93.25	93.33
Alloy steel	4,700	4,740	4.94	4.77
Stainless steel	1,730	1,890	1.81	1.90
Total	95,200	99,300	100.00	100.00
Steel mill products:				
Ingots, blooms, billets and slabs	1,160	1,500	1.22	1.51
Wire rods	1,760	1,840	1.84	1.86
Structural shapes, heavy	6,730	7,220	7.07	7.26
Steel piling	582	582	0.61	0.59
Plates, cut lengths	5,830	6,490	6.12	6.53
Plates, in coils	3,470	3,150	3.64	3.17
Rails	633	726	0.66	0.73
Railroad accessories	196	225	0.21	0.23
Bars, hot-rolled	6,300	7,060	6.61	7.11
Bars, light-shaped	1,470	1,490	1.54	1.50
Bars, reinforcing	6,350	6,830	6.67	6.87
Bars, cold finished	1,470	1,420	1.55	1.43
Tool steel	20	16	0.02	0.02
Pipe and tubing, standard pipe	1,030	1,140	1.08	1.15
Pipe and tubing, oil country goods	2,030	2,100	2.14	2.12
Pipe and tubing, line pipe	366	503	0.38	0.51
Pipe and tubing, mechanical tubing	998	966	1.05	0.97
Pipe and tubing, pressure tubing	38	43	0.04	0.04
Pipe and tubing, stainless	14	15	0.01	0.01
Pipe and tubing, structural	130	141	0.14	0.14
Pipe for piling	11	10	0.01	0.01
Wire	607	681	0.64	0.69
Tin mill products, blackplate	163	136	0.17	0.14
Tin mill products, tinplate	1,860	1,840	1.95	1.85
Tin mill products, tin-free steel	493	544	0.52	0.55
Tin mill products, tin coated sheets	96	93	0.10	0.09
Sheets, hot-rolled	20,300	19,400	21.30	19.55
Sheets, cold-rolled	11,600	12,000	12.19	12.13
Sheets and strip, hot dip galvanized	13,600	14,800	14.29	14.94
Sheets and strip, electrogalvanized	2,240	2,370	2.35	2.39
Sheets and strip, other metallic coated	1,710	1,890	1.80	1.90
Sheets and strip, electrical	424	481	0.45	0.48
Strip, hot rolled	36	38	0.04	0.04
Strip, cold rolled	1,520	1,500	1.59	1.51
Total	95,200	99,300	100.00	100.00
Shipments by markets:				
Service centers and distributors	27,700	27,300	29.11	27.49
Construction	21,700	19,000	22.83	19.13
Automotive	13,100	14,100	13.79	14.20
Machinery	1,500	1,380	1.57	1.39
Containers	2,740	2,820	2.88	2.84
All others	28,400	34,700	29.81	34.94
Total	95,200	99,300	100.00	100.00

[1]Data are rounded to no more than three significant digits, except percentages; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 4
U.S. IMPORTS AND EXPORTS OF STEEL MILL PRODUCTS, BY COUNTRY[1]

(Thousand metric tons)

Country	2005		2006	
	Imports	Exports	Imports	Exports
Argentina	258	4	148	3
Australia	533	14	1,060	13
Brazil	2,340	24	2,630	37
Canada	5,350	5,310	5,400	5,530
China	2,150	157	4,890	89
European Union[2]	5,270	325	5,690	348
Germany	1,360	105	1,220	43
Japan	1,250	24	1,910	23
Korea, Republic of	1,640	29	2,540	47
Mexico	3,730	1,730	3,300	2,000
Russia	1,430	--	3,300	--
South Africa	297	7	426	10
Sweden	286	2	255	4
Taiwan	551	24	1,700	16
Turkey	1,220	--	2,180	--
Ukraine	587	--	1,590	--
Venezuela	441	55	180	54
Other	493	706	2,670	603
Total	29,200	8,520	41,100	8,830

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Excludes Germany and Sweden.

Source: American Iron and Steel Institute.

TABLE 5
U.S. EXPORTS OF IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2005	2006
Steel mill products:		
Ingots, blooms, billets, slabs	304	199
Wire rods	146	137
Structural shapes, heavy	666	777
Steel piling	38 [r]	32
Plates, cut lengths	1,050	1,050
Plates, in coils	673	587
Rails, standard	71	82
Rails, other	15	17
Railroad accessories	28	49
Bars, hot-rolled	388 [r]	477
Bars, light-shaped	90	82
Bars, concrete reinforcing	253	273
Bars, cold-finished	127	147

See footnotes at end of table.

TABLE 5—Continued
U.S. EXPORTS OF IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2005	2006
Steel mill products—Continued:		
Tool steel	19	21
Pipe and tubing, standard pipe	82	113
Pipe and tubing, oil country goods	327	399
Pipe and tubing, line pipe	189	226
Pipe and tubing, mechanical tubing	28	31
Pipe and tubing, stainless	50	72
Pipe and tubing, nonclassified	269	318
Pipe and tubing, structural	161	188
Pipe for piling	4	2
Wire	141	165
Tin mill products, blackplate	7	4
Tin mill products, tinplate	251 r	196
Tin mill products, tin-free steel	29	18
Sheets, hot-rolled	906	612
Sheets, cold-rolled	565	585
Sheets and strip, hot-dip galvanized	637	757
Sheets and strip, electrogalvanized	232	290
Sheets and strip, other metallic coated	163	196
Sheets and strip, electrical	131	156
Strip, hot-rolled	212	258
Strip, cold-rolled	264	302
Total	8,520 r	8,830
Fabricated steel products:		
Structural shapes, fabricated	256 r	357
Rails, used	34	22
Railroad products	91 r	95
Wire rope	12	16
Wire, stranded products	29	31
Wire, other products	26	81
Springs	112	123
Nails and staples	29	38
Fasteners	931	540
Chains and parts	26	27
Grinding balls	11	51
Pipe and tube fittings	35	33
Other[2]	123 r	111
Total	1,710	1,540
Grand total	11,500 r	10,400
Cast iron and steel products:		
Cast steel pipe fittings	35	33
Cast iron pipe and fittings	23	80
Cast steel rolls	20	10
Cast grinding balls	18	30 e
Granules, shot and grit	30	50 e
Other castings	67	65
Total	193	268

eEstimated. rRevised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes shapes cold formed, sashes and frames, fence and sign post, architectural and ornamental work, and conduit.

Source: American Iron and Steel Institute.

TABLE 6
U.S. IMPORTS OF MAJOR IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2005	2006
Steel mill products:		
Ingots, blooms, billets, and slabs	6,270	8,460
Wire rods	2,270	2,760
Structural shapes-heavy	575	943
Steel piling	94	97
Plates, cut lengths	997	1,520
Plates, in coils	941	1,580
Rails and railroad accessories	215	10
Bars, hot-rolled	1,500	1,470
Bars, light-shaped	225	285
Bars, reinforcing	1,290	2,350
Bars, cold-finished	414	377
Tool steel	192	160
Pipe and tubing, standard pipe	1,190	1,460
Pipe and tubing, oil country goods	1,510	1,890
Pipe and tubing, line pipe	1,080	1,810
Pipe and tubing, mechanical tubing	653	754
Pipe and tubing, pressure tubing	168	100
Pipe and tubing, stainless	122	142
Pipe and tubing, nonclassified	15	17
Pipe and tubing, structural	512	640
Pipe for piling	22	35
Wire	776	820
Tin mill products-blackplate	36	76
Tin mill products-tinplate	391	494
Tin mill products-tin-free steel	92	109
Sheets, hot-rolled	2,870	4,610
Sheets, cold-rolled	1,740	3,320
Sheets and strip, hot-dip galvanized	2,100	3,310
Sheets and strip, electrogalvanized	147	175
Sheets and strip, other metallic coated	431	671
Sheets and strip, electrical	75	81
Strip, hot-rolled	96	76
Strip, cold-rolled	170	178
Total	29,200	41,100
Fabricated steel products:		
Structural shapes, fabricated	808	1,380
Rails, used	164	185
Railroad products	178	214
Wire rope	127	134
Wire-stranded products	256	357
Springs	529	495
Nails and staples	930	943
Fasteners	1,340	1,500
Chains and parts	133	154
Pipe and tube fittings	185	243
Other	475	323
Total	5,120	5,930
Grand total	34,300	47,000

See footnotes at end of table.

TABLE 6—Continued
U.S. IMPORTS OF MAJOR IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2005	2006
Cast iron and steel products:		
Cast steel pipe fittings	185	243
Cast iron pipe and fittings	64	68
Other products	498	440
Total	747	751

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 7
U.S. IMPORTS OF STAINLESS STEEL[1]

(Metric tons)

Product	2005	2006
Semifinished	145,000	130,000
Plate	75,700	102,000
Sheet and strip	51,300	67,500
Bars and shapes	117,000	114,000
Wire and wire rods	75,400	70,500
Pipe and tube	122,000	157,000
Total	585,000	641,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 8
COAL AND COKE AT COKE PLANTS[1, 2]

(Thousand metric tons)

	2005	2006
Coal, consumption	21,300	20,800
Coke:[3]		
Production	15,200	14,900
Exports	1,590	1,470
Imports	3,200	3,690
Consumption, apparent	16,500	17,000

[1]Data are rounded to no more than three significant digits.
[2]Includes furnace and merchant coke plants.
[3]Coke production and consumption do not include breeze.

Source: Energy Information Administration, Quarterly Coal Report, DOE/EIA-0121(2006/04Q).

TABLE 9
PIG IRON AND DIRECT-REDUCED IRON: WORLD PRODUCTION, BY COUNTRY[1, 2, 3, 4]

(Thousand metric tons)

Country[5]	2002	2003	2004	2005	2006
Algeria[e]	1,300	1,300	994 [6]	952 [r]	1,100
Argentina:					
Pig iron	2,180	2,402	2,392	2,646	2,500
Direct-reduced iron	1,476	1,736	1,755	1,821	1,900
Australia	6,106 [r]	6,116 [r]	5,735 [r]	6,648 [r]	6,433 [6]
Austria[e]	4,300 [6]	4,300	4,300	4,300	4,300
Belgium	8,053	8,000	8,000 [e]	8,000 [e]	8,000
Bosnia and Herzegovina[e]	60	60	60	50 [r]	50
Brazil:					
Pig iron	29,667	32,036	34,579	34,382	34,500 [p]
Direct-reduced iron[e]	400 [6]	410	440	411	420 [p]
Bulgaria	1,072	1,386	1,158 [r]	1,081 [r]	1,100
Burma:[e]					
Pig iron	2	2	2	2	2
Direct-reduced iron	40	40	40	40	40
Canada:					
Pig iron	8,800	8,800 [e]	8,800 [e]	8,800	8,800
Direct-reduced iron	920	920 [e]	920 [e]	920	920
Chile	934	988	1,137	1,074 [r]	1,133 [6]
China[7]	170,850	213,660	251,850	343,750 [r]	404,170 [6]
Colombia	313	288	316	315	325
Czech Republic	4,840	5,207	5,384	4,627 [r]	5,193 [6]
Egypt:					
Pig iron[e]	1,800	1,500	1,500	1,500	1,500
Direct-reduced iron	2,530	2,870	2,800 [e]	2,800 [e]	2,800
Finland	2,828	6,000	1,000	2,000 [e]	2,000
France	13,217	12,756	13,198 [r]	12,705 [r]	13,013 [6]
Germany:					
Pig iron	29,427	29,481	30,018	28,854	30,360 [6]
Direct-reduced iron[e]	540	590	610	440 [r]	580
Hungary	1,335	1,333	1,351	1,350 [e]	1,335 [6]
India:					
Pig iron	24,315	24,000	25,000 [e]	25,500 [e]	26,000
Direct-reduced iron	6,590 [r]	7,670 [r]	9,370 [r]	12,040 [r]	14,740 [6]
Indonesia, direct-reduced iron[e]	1,500	1,230 [r]	1,470 [r]	1,390 [r]	1,290 [6]
Iran:					
Pig iron	2,400	2,709 [r]	2,136 [r]	2,300	1,900
Direct-reduced iron[e]	5,280 [6]	5,620	6,410	6,850	6,850
Italy	9,736	10,148 [r]	10,604 [r]	11,423 [r]	11,535 [6]
Japan	80,979	82,092	82,974	83,058	84,270 [6]
Kazakhstan	4,089	4,140 [e]	4,283	3,581	3,400
Korea, North[e]	800	900	900	900 [6]	900
Korea, Republic of	26,570	27,314	27,556	27,309 [r]	27,548 [6]
Libya, direct-reduced iron[e]	1,170 [6]	1,340	1,580	1,650	1,630
Malaysia, direct-reduced iron	1,061	1,600	1,710	1,349 [r]	1,500
Mexico:					
Pig iron	3,996	4,183	4,278	4,047	3,800
Direct-reduced iron	4,741	5,473	6,345	5,973	6,200
Morocco[e]	15	15	15	15	15
Netherlands[e, 8]	5,381 [6]	5,300	5,300	5,300	5,300
New Zealand[e]	600 [6]	600	600	600	600
Nigeria	--	--	--	--	--
Norway[e]	80	90	90	90	90
Pakistan[e]	1,500	1,500	1,500	1,500	1,500
Paraguay	88	98	119 [r]	126 [r]	125 [p]

See footnotes at end of table.

TABLE 9—Continued
PIG IRON AND DIRECT-REDUCED IRON: WORLD PRODUCTION, BY COUNTRY[1, 2, 3, 4]

(Thousand metric tons)

Country[5]	2002	2003	2004	2005	2006[e]
Peru:[e]					
Pig iron	330 [6]	330	330	330	330
Direct-reduced iron	80 [6]	80	80	80	80
Poland	5,296	5,632	6,399	4,477 [r]	5,327 [6]
Portugal	100	100	100	100	100
Qatar, direct-reduced iron	750	780 [e]	830 [e]	820 [r]	880
Romania	3,979	4,101	4,344	4,400 [e]	3,861 [6]
Russia:					
Pig iron	46,060	48,368	50,427	49,175 [r]	51,683 [6]
Direct-reduced iron[e]	2,910 [6]	2,900	3,140	3,340	3,340
Saudi Arabia, direct-reduced iron	3,290	3,290	3,141	3,630 [e]	3,580
Serbia and Montenegro[9]	485	635	1,003 [r]	1,208 [r]	1,475 [6]
Slovakia	3,533	3,892	3,765	3,618 [r]	4,145 [6]
South Africa:					
Pig iron	5,823	6,234	6,011	6,130	6,160 [6]
Direct-reduced iron	1,702	1,542	1,630 [e]	1,781 [r]	1,754 [6]
Spain[e]	3,978 [6]	4,000	4,000	4,200 [r]	4,300
Sweden[e]	3,703 [6]	3,700	3,600	3,500	3,500
Switzerland[e]	100	100	100	100	100
Taiwan	10,524	10,799	10,198	9,854 [r]	10,500
Trinidad and Tobago, direct-reduced iron	2,316	2,275	2,337	2,055 [r]	2,000
Tunisia	152	36	-- [e]	-- [e]	--
Turkey	158	181	213 [r]	215 [r, e]	215
Ukraine	27,560	29,570	31,000	30,747	32,926 [6]
United Kingdom	8,561 [r]	10,228 [r]	10,180 [r]	10,189 [r]	10,736 [6]
United States:					
Pig iron	40,200	40,600	42,300	37,200	37,900 [6]
Direct-reduced iron	470	210	180	220	240 [6]
Venezuela, direct-reduced iron	6,824	6,645	7,800 [r]	8,900 [r]	8,400
Zimbabwe[e]	122	182 [r]	145 [r]	125 [r]	50
Grand total	653,000 [r]	715,000	764,000 [r]	851,000 [r]	925,000
Of which:					
Pig iron	608,000 [r]	667,000 [r]	711,000 [r]	794,000 [r]	866,000
Direct-reduced iron	44,600 [r]	47,200 [r]	52,600 [r]	56,500 [r]	59,100

[e]Estimated. [p]Preliminary. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Production is pig iron unless otherwise specified.

[3]Direct-reduced iron is obtained from ore by reduction of oxides to metal without melting.

[4]Table excludes ferroalloy production except where otherwise noted. Table includes data available through August 10, 2007.

[5]In addition to the countries listed, Vietnam has facilities to produce pig iron and may have produced limited quantities during 2002–06, but output is not reported and available information is inadequate to make reliable estimates of output levels.

[6]Reported figure.

[7]Figures reported by State Statistical Bureau that the Chinese Government considers to be official statistical data.

[8]Includes blast furnace ferroalloys.

[9]In June 2006, Montenegro and Serbia formally declared independence from each other and dissolved their union. Mineral production data for 2006, however, still reflect the unified country.

TABLE 10
RAW STEEL: WORLD PRODUCTION, BY COUNTRY[1, 2, 3]

(Thousand metric tons)

Country[4]	2002	2003	2004	2005	2006
Albania	81 r	86 r	98 r	145 r	150 e
Algeria	1,091	1,051	1,014	1,007	1,200 e
Argentina	4,362 r	5,033 r	5,131 r	5,384 r	5,533
Australia	8,874 r	9,678 r	8,353 r	7,788 r	7,937
Austria	6,208	6,261	6,530	7,031	7,000 e
Bangladesh[e, 5]	30	25	25	20	20
Belarus[e]	1,500	1,570	1,900	2,076 [6]	2,200
Belgium	11,495	11,114	11,698	10,422	1,050 e
Bosnia and Herzegovina	147 r	106 r	71 r	370 r	469
Brazil[7]	29,605	31,150	32,918	31,631	31,800 p
Bulgaria	1,860 e	2,317	2,106	1,969 r	2,000
Burma[e]	25	25	25	25	25
Canada	16,300	17,000	17,000 e	17,000 e	17,000 e
Chile[7]	1,279	1,377	1,579	1,536 r	1,627
China[8]	182,370	222,340	272,450	353,240 r	418,780
Colombia	664	668	730 r, e	830 r, e	845
Croatia	34	41	68	73 r	75
Cuba	264	210 e	193 r	245 r	265 e
Czech Republic	6,512	6,783	7,033	6,189 r	6,860
Denmark[e]	392 [6]	--	--	--	--
Dominican Republic[e]	61 [6]	61	61	61	60
Ecuador	69	80	73 r	85 r	87 e
Egypt	4,358	4,398	4,757	4,760	4,800 e
El Salvador	49	57	59	48 r	77 e
Finland	4,004	4,766	4,833	4,800 e	4,800 e
France	20,524	19,578	20,770	19,481	19,867
Germany	44,999	44,809	46,374	44,524	47,223
Ghana, all from scrap[e]	75	75	75	75	75
Greece	1,835	1,701	1,967	2,266	2,300 e
Guatemala	216	226	232	208 r	292
Hong Kong[e]	500	500	500	500	550
Hungary	2,053 r	1,989 r	1,984	1,962 r	1,983
India	28,814	31,779	32,600 r	40,900 r, *	44,000 *
Indonesia	2,462	2,042	2,412	3,700 r	3,800
Iran	7,293	7,869	9,382	9,405 r	9,800 e
Israel[e]	150	150	280	350 r	380
Italy	25,930	26,832	28,317	29,061	31,550
Japan	107,745	110,511	112,718	112,471	116,219
Jordan	134	135	140	140 e	140 e
Kazakhstan	4,868	5,067	5,400 e	4,452	4,225
Korea, North[e]	1,030	1,090	1,070	1,070	1,070
Korea, Republic of	45,390	46,310	47,521 r	47,820 r	48,437
Latvia	507	546	554	550 e	550 e
Libya	886	1,007	1,026	1,260 r	1,200 e
Luxembourg	2,736	2,675	2,684	2,194	2,200 e
Macedonia	225	291	309	310 r	310
Malaysia	4,722	3,960	5,698	5,296 r	5,500 e
Mauritania[e]	5	5	5	5	5
Mexico	14,010	15,159	16,737 r	16,195 r	16,313
Moldova	514	886	1,013	1,000 e	675
Morocco[e]	5	5	5	5	5
Netherlands	6,144	6,571	6,848	6,919	6,900 p
New Zealand[e]	750	750	850 r	813 r	810
Norway[e]	694	698	695	690	695

See footnotes at end of table.

TABLE 10—Continued
RAW STEEL: WORLD PRODUCTION, BY COUNTRY[1, 2, 3]

(Thousand metric tons)[*]

Country[4]	2002	2003	2004	2005	2006
Pakistan[e]	550 [r]	550 [r]	600 [r]	700 [r]	800
Paraguay	80	93 [r]	109 [r]	103 [r]	105 [p]
Peru[e]	750	750	750	750	750
Philippines[e]	530	550 [r]	550 [r]	550 [r]	550
Poland	8,369	9,107	10,593	8,336 [r]	10,008
Portugal	894 [r]	722	720	725 [r]	725 [p]
Qatar	1,027	1,054	1,089 [r]	1,057 [r]	1,050 [e]
Romania	5,491	5,691	6,042	5,854	6,324
Russia	59,777	62,710	65,646	66,186	70,766
Saudi Arabia	3,570 [e]	3,944	3,902	4,185 [r]	4,000 [e]
Serbia and Montenegro	596	569	1,167	1,292 [r]	1,837
Singapore[e]	400	400	500	600	610
Slovakia	4,275	4,588	4,454	4,482	5,094
Slovenia	481 [e]	541	565	585 [e]	627
South Africa	9,095	9,481	9,504	9,492	9,721
Spain	16,358	16,287	17,684	17,711	18,400 [e]
Sri Lanka[e]	30	30	30	30	30
Sweden	5,754	5,707	5,949	6,000 [e]	6,000 [e]
Switzerland[e]	1,000	1,000	1,000	1,000	1,000
Syria[e]	70	70	70	70	70
Taiwan	18,255	18,832	19,604	18,567	19,203
Thailand	2,538	3,572	4,533	5,161 [r]	5,350 [e]
Trinidad and Tobago	839	923	783	800 [e]	800 [e]
Tunisia[e]	200	86	63 [6]	60 [6]	60
Turkey	16,046	18,298	20,478	20,960	23,300 [e, *]
Uganda[e]	7	7	7	7	7
Ukraine	34,538	36,900 [e]	38,740	38,636	40,899
United Arab Emirates[e]	70	50	70	70	70
United Kingdom	11,718	13,128	13,766	13,210	13,952
United States	91,600	93,700	99,700	94,900	98,200
Uruguay	35	41 [r]	58 [r]	64 [r]	65 [p]
Uzbekistan[e]	450	472	602 [6]	607 [6]	730
Venezuela	4,164	3,930	4,575	4,907 [r]	4,900 [e]
Vietnam	409	544	689 [r]	890 [r]	1,000 [e]
Zimbabwe[e]	105	152	150	119 [r, 6]	100
Total	907,000 [r]	974,000 [r]	1,060,000	1,140,000 [r, *]	1,230,000 [*]

[e]Estimated. [p]Preliminary. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Steel formed in solid state after melting, suitable for further processing or sale; for some countries, includes material reported as "liquid steel, "presumably measured in the molten state prior to cooling in any specific form.

[3]Table includes data available through July 27, 2007.

[4]In addition to the countries listed, Mozambique is known to have steelmaking plants, but available information is inadequate to make reliable estimates of output levels.

[5]Data for year ending June 30 of that stated.

[6]Reported figure.

[7]Excludes castings.

[8]Figures reported by the State Statistical Bureau that Chinese Government considers as official statistical data.

[*]Corrections posted May 13, 2008.