

## IRON AND STEEL<sup>1</sup>

(Data in million metric tons of metal, unless otherwise noted)

**Domestic Production and Use:** The iron and steel industry and ferrous foundries produced goods valued at about \$75 billion. The steel industry consisted of 92 companies that produced raw steel at 126 locations, with combined raw steel production capability of 122 million tons. Indiana accounted for about 23% of total raw steel production, followed by Ohio, 14%, and Pennsylvania, 8%. Pig iron was produced by 14 companies operating integrated steel mills, with about 40 blast furnaces in continuous operation. Integrated companies accounted for about 62% of total steel production, including output of their electric arc furnaces. The distribution of steel shipments was estimated as follows: warehouses and steel service centers, 21%; transportation (predominantly for automotive production), 14%; construction, 13%; cans and containers, 4%; and others, 48%. Ferrous foundries, numbering about 1,100, continued to be importers of pig iron into the United States, mainly from Brazil and Russia.

| <b>Salient Statistics—United States:</b> <sup>1</sup>                 | <b>1993</b> | <b>1994</b> | <b>1995</b> | <b>1996</b> | <b>1997<sup>e</sup></b> |
|---|-------------|-------------|-------------|-------------|-------------------------|
| Pig iron production <sup>2</sup>                                      | 48.2        | 49.4        | 50.9        | 49.4        | 53.8                    |
| Steel production:   | 88.8        | 91.2        | 95.2        | 95.5        | 96.7                    |
| Basic oxygen furnaces, percent  | 60.6        | 60.7        | 59.6        | 57.4        | 60.1                    |
| Electric arc furnaces, percent  | 39.4        | 39.3        | 40.4        | 42.6        | 46.6                    |
| Continuously cast steel, percent                                      | 85.7        | 89.5        | 91.0        | 93.2        | 94.5                    |
| Shipments:  |             |             |             |             |                         |
| Steel mill products   | 80.8        | 86.3        | 88.4        | 91.5        | 95.0                    |
| Steel castings <sup>3</sup>   | 1.4         | 1.0         | 1.1         | 1.2         | 1.3                     |
| Iron castings <sup>3</sup>  | 11.9        | 13.2        | 9.8         | 9.7         | 9.6                     |
| Imports of steel mill products  | 17.7        | 27.3        | 22.1        | 26.5        | 29.2                    |
| Exports of steel mill products  | 3.6         | 3.5         | 6.4         | 4.6         | 5.2                     |
| Apparent steel consumption <sup>4</sup>                               | 92.0        | 104         | 108         | 108         | 113                     |
| Producer price index for steel mill products (1982=100) <sup>5</sup>  | 108.2       | 113.4       | 120.1       | 115.7       | 116.8                   |
| Steel mill product stocks at service centers, yearend <sup>6</sup>    | 5.7         | 6.6         | 5.9         | 7.0         | 7.1                     |
| Total employment, average, <sup>7</sup> number                        |             |             |             |             |                         |
| Blast furnaces and steel mills  | 175,000     | 172,000     | 171,000     | 168,000     | 169,000                 |
| Iron and steel foundries  | 119,000     | 125,000     | 130,000     | 129,000     | 128,000                 |
| Net import reliance <sup>8</sup> as a percent of apparent consumption | 15          | 22          | 21          | 20          | 21                      |

**Recycling:** See Iron and Steel Scrap and Iron and Steel Slag.

**Import Sources (1993-96):** European Union, 30%; Canada, 18%; Japan, 10%; Brazil, 8%; and other, 34%.

| <b>Tariff:</b> <sup>9</sup> | <b>Item</b>         | <b>Number</b> | <b>Most favored nation (MFN)<sup>10</sup></b> | <b>Canada</b>      | <b>Mexico</b>   | <b>Non-MFN<sup>11</sup></b> |
|-----------------------------|---------------------|---------------|---|--------------------|-----------------|-----------------------------|
|                             |                     |               | <b>12/31/97</b>                               | <b>12/31/97</b>    | <b>12/31/97</b> | <b>12/31/97</b>             |
|                             | Pig iron            | 7201.10.0000  | Free  | Free               | Free            | \$1.11/t.                   |
|                             | Carbon steel:       |               |   |                    |                 |                             |
|                             | Semifinished        | 7207.12.0050  | 2.9%  | 0.4%               | 2.5%            | 20%.                        |
|                             | Structural shapes   | 7216.33.0090  | 0.6%  | Free               | 0.5%            | 2%.                         |
|                             | Bars, hot-rolled    | 7213.20.0000  | 1.3%  | 0.1%               | 1.1%            | 5.5%.                       |
|                             | Sheets, hot-rolled  | 7208.39.0030  | 3.4%  | 0.4%               | 2.9%            | 20%.                        |
|                             | Hot-rolled, pickled | 7208.27.0060  | 3.6%  | 0.5%               | 3.0%            | 0.4¢/kg+20%.                |
|                             | Cold-rolled         | 7209.18.2550  | 2.2%  | 0.3%               | 1.9%            | 20%.                        |
|                             | Galvanized          | 7210.49.0090  | 4.6%  | 0.6%               | 3.9%            | 21.5%.                      |
|                             | Stainless steel:    |               |   |                    |                 |                             |
|                             | Semifinished        | 7218.91.0015  | 3.6%  | 0.5%               | 3.1%            | 29%.                        |
|                             |                     | 7218.99.0015  | 3.6%  | 0.5%               | 3.1%            | 29%.                        |
|                             | Bars, cold-finished | 7222.20.0075  | 7.4%  | 1.0%               | 6.3%            | 29%.                        |
|                             | Pipe and tube       | 7304.41.3045  | <sup>12</sup> 5.3%                            | <sup>12</sup> 0.7% | Free            | 36%.                        |
|                             | Cold-rolled sheets  | 7219.33.0035  | 7.1%  | 1.0%               | 6.0%            | 29%.                        |

## IRON AND STEEL

**Depletion Allowance:** Not applicable.

**Government Stockpile:** None.

**Events, Trends, and Issues:** Pig iron production decreased slightly during 1997 as steel production and shipments continued to increase. Output was curbed by strikes, equipment failures, and delays of new capacity startups. The basic oxygen process used in integrated mills continued to decline in importance relative to the use of electric arc furnaces and continuous casting in minimills. Imports of steel products continued to increase significantly, exceeding those of 1994, and competed with increased domestic steelmaking capacity coming on line during 1997. Export activity increased relative to that of 1996, but was below the record 1995 level.

Integrated mills and minimills continued to increase usage of direct reduction and direct ironmaking technologies. The increasing burdens of environmental regulations and escalating capital costs associated with construction of blast furnaces and coke ovens and rising costs of low-residual scrap have created a strong demand for direct-reduced iron and iron made by direct smelting reduction processes. Nevertheless, capital expenditures on blast furnaces and cold-rolling and galvanizing facilities by integrated steelmakers was an estimated \$2.1 billion in 1997, an increase of 24% over that of 1996. Capital expenditures in minimills declined to about \$1.3 billion, 44% less than that of 1996.

**World Production:**

|                       | Pig iron     |                         | Raw steel   |                         |
|-----------------------|--------------|-------------------------|-------------|-------------------------|
|                       | <u>1996</u>  | <u>1997<sup>e</sup></u> | <u>1996</u> | <u>1997<sup>e</sup></u> |
| United States         | 49.4         | 49.3                    | 94.7        | 96.0                    |
| Brazil                | 25.1         | 24.6                    | 25.7        | 26.2                    |
| China                 | 105          | 113                     | 100         | 106                     |
| European Union        | 91.8         | 96.6                    | 147         | 157                     |
| Japan                 | 74.6         | 78.6                    | 98.8        | 105                     |
| Korea, Republic of    | 23.0         | 22.4                    | 38.9        | 41.4                    |
| Russia                | 36.1         | 36.9                    | 49.2        | 48.6                    |
| Ukraine               | 18.1         | 20.7                    | 22.3        | 24.9                    |
| Other countries       | <u>138.9</u> | <u>93.9</u>             | <u>181</u>  | <u>168</u>              |
| World total (rounded) | 562          | 536                     | 758         | 773                     |

**World Resources:** Not applicable. See Iron Ore.

**Substitutes:** Iron is the least expensive and most widely used metal. In most applications, iron and steel compete either with less expensive nonmetallic materials or with more expensive materials having a property advantage. Iron and steel compete with lighter materials, such as aluminum and plastics, in the motor vehicle industry; aluminum, concrete, and wood in construction; and aluminum, glass, paper, and plastics in containers.

<sup>e</sup>Estimated.

<sup>1</sup>Production and shipments data source is the American Iron and Steel Institute (AISI); see also Iron Ore and Iron and Steel Scrap.

<sup>2</sup>More than 95% of iron made is transported molten to steelmaking furnaces located at the same site.

<sup>3</sup>U.S. Department of Commerce, Bureau of the Census.

<sup>4</sup>Defined as steel shipments + imports - exports + adjustments for industry stock changes + adjustment for imports of semifinished steel products.

<sup>5</sup>Bureau of Labor Statistics.

<sup>6</sup>Steel Service Center Institute.

<sup>7</sup>Bureau of Labor Statistics. Blast furnaces and steel mills: SIC 3312; Iron and steel foundries: SIC 3320.

<sup>8</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>9</sup>All tariff percentages are ad valorem.

<sup>10</sup>No tariff for Israel and certain Caribbean and Andean nations.

<sup>11</sup>See Appendix B.

<sup>12</sup>No tariff for use in civil aircraft.