

COPPER

(Data in thousand metric tons of copper content unless otherwise noted)

Domestic Production and Use: Domestic mine production in 2005 fell nominally to 1.15 million tons and was valued at about \$4.3 billion. The principal mining States, in descending order of production, Arizona, Utah, New Mexico, Nevada, and Montana, accounted for 99% of domestic production; copper was also recovered at mines in two other States. Although copper was recovered at 24 mines operating in the United States, 14 mines accounted for more than 99% of production. Three primary smelters, 4 electrolytic and 3 fire refineries, and 13 solvent extraction-electrowinning facilities operated during the year. Refined copper and direct-melt scrap were consumed at about 30 brass mills; 15 rod mills; and 500 foundries, chemical plants, and miscellaneous consumers. Copper and copper alloy products were used in building construction, 49%; electric and electronic products, 21%; transportation equipment, 11%; industrial machinery and equipment, 9%; and consumer and general products, 10%.¹

Salient Statistics—United States:	2001	2002	2003	2004	2005^e
Production:					
Mine	1,340	1,140	1,120	1,160	1,150
Refinery:					
Primary	1,630	1,440	1,250	1,260	1,180
Secondary	172	70	53	55	55
Copper from all old scrap	316	208	206	186	190
Imports for consumption:					
Ores and concentrates	46	72	27	23	(²)
Refined	991	927	882	807	920
Unmanufactured	1,400	1,230	1,140	1,060	1,140
Exports:					
Ores and concentrates	45	23	9	24	110
Refined	23	26	93	118	45
Unmanufactured	556	506	703	789	820
Consumption:					
Reported refined	2,620	2,370	2,290	2,410	2,270
Apparent unmanufactured ³	2,500	2,610	2,430	2,550	2,290
Price, average, cents per pound:					
Domestic producer, cathode	76.9	75.8	85.2	133.9	169
London Metal Exchange, high-grade	71.6	70.7	80.7	130.0	165
Stocks, yearend, refined, held by U.S. producers, consumers, and metal exchanges	952	1,030	657	134	70
Employment, mine and mill, thousands	8.2	7.0	6.8	7.0	7.0
Net import reliance ⁴ as a percentage of apparent consumption	22	37	40	43	40

Recycling: Old scrap, converted to refined metal and alloys, provided 190,000 tons of copper, equivalent to 8% of apparent consumption. Purchased new scrap, derived from fabricating operations, yielded 750,000 tons of contained copper; about 88% of the copper contained in new scrap was consumed at brass or wire-rod mills. Of the total copper recovered from scrap (including aluminum- and nickel-base scrap), brass mills recovered 73%; copper smelters and refiners, 5%; ingot makers, 10%; and miscellaneous manufacturers, foundries, and chemical plants, 12%. Copper in all old and new, refined or remelted scrap contributed about 30% of the U.S. copper supply.

Import Sources (2001-04): Unmanufactured: Canada, 31%; Chile, 28%; Peru, 21%; Mexico, 9%; and other, 11%. Refined copper accounted for 75% of unwrought copper imports.

Tariff: Item	Number	Normal Trade Relations⁵ 12-31-05
Copper ores and concentrates	2603.00.0000	1.7¢/kg lead content.
Unrefined copper; anodes	7402.00.0000	Free.
Refined and alloys; unwrought	7403.00.0000	1.0% ad val.
Copper wire (rod)	7408.11.6000	3.0% ad val.

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

Government Stockpile: The stockpile of about 20,000 tons of refined copper was liquidated in 1993. The stockpile of about 8,100 tons of brass was liquidated in 1994. Details on inventories of beryllium-copper master alloys (4% beryllium) can be found in the section on beryllium.

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Events, Trends, and Issues: Copper prices trended upward throughout the year, and the COMEX spot price reached a record-high monthly average of \$1.90 per pound in October. Despite a more than 3% estimated growth in world production of refined copper, production was insufficient to meet global demand, and the refined copper production deficit that had developed during the preceding 2 years continued through at least the first 3 quarters of 2005. Global inventories of refined copper held in metal exchange warehouses continued their downward trend, falling below 100,000 tons during the third quarter of the year. This shortfall occurred despite a decline in global consumption, which, according to estimates compiled by the International Copper Study Group,⁶ declined slightly for the first 7 months of 2005 compared with that for the same period in 2004. Strong growth in China and India was more than offset by reduced use by other significant consumers. Global mine production fell short of its anticipated growth owing to production shortfalls in the United States and South America, and mine capacity utilization fell to its lowest level in recent years. New capacity and increased capacity utilization was expected to reverse the global production deficit, and a modest production surplus was anticipated for 2006.

In the United States, mine output fell to about 1,150,000 tons owing to unusually heavy spring rains, equipment shortages, and a strike by workers at one major producer that began in July and extended through the second week in November. Subsequent to the start of the strike, the company declared Chapter 11 Bankruptcy. Year-on-year U.S. consumption of refined copper fell during the first 9 months of 2005 owing to weaker demand and a surge in imports of wire rod in the first half of 2005. U.S. mine and refinery production were expected to increase in 2006 following settlement of the strike and the expected startup of a new electrowinning facility by yearend 2005.

World Mine Production, Reserves, and Reserve Base: Official reserves data reported by Poland may include properties being considered for future development.

	Mine production		Reserves ⁷	Reserve base ⁷
	2004	2005 ^e		
United States	1,160	1,150	35,000	70,000
Australia	854	930	24,000	43,000
Canada	564	580	7,000	20,000
Chile	5,410	5,320	140,000	360,000
China	620	640	26,000	63,000
Indonesia	840	1,050	35,000	38,000
Kazakhstan	461	400	14,000	20,000
Mexico	406	420	27,000	40,000
Peru	1,040	1,000	30,000	60,000
Poland	531	530	30,000	48,000
Russia	675	675	20,000	30,000
Zambia	427	450	19,000	35,000
Other countries	<u>1,610</u>	<u>1,750</u>	<u>60,000</u>	<u>110,000</u>
World total (rounded)	14,600	14,900	470,000	940,000

World Resources: A recent assessment of U.S. copper resources indicated 550 million tons of copper in identified (260 million tons) and undiscovered resources (290 million tons), more than double the previous estimate.⁸ By extension, global land-based resources are expected to be much larger than the previously published estimate of 1.6 billion tons. Resources in deep-sea nodules were estimated to contain 700 million tons of copper.

Substitutes: Aluminum substitutes for copper in power cables, electrical equipment, automobile radiators, and cooling/refrigeration tube; titanium and steel are used in heat exchangers; optical fiber substitutes for copper in some telecommunications applications; and plastics substitute for copper in water pipe, drain pipe, and plumbing fixtures.

^eEstimated.

¹Some electrical components are included in each end use. Distribution for 2004 by Copper Development Association, 2005.

²Less than ½ unit.

³Defined as primary refined production + copper from old scrap converted to refined metal and alloys + refined imports – refined exports ± changes in refined stocks. In 2001, 2002, 2003, 2004, and 2005, general imports of 1,200,000 tons, 1,060,000 tons, 687,000 tons, 704,000 tons, and 900,000 tons, respectively, were used to calculate apparent consumption.

⁴Defined as imports – exports + adjustments for Government and industry stock changes for refined copper.

⁵No tariff for Canada and Mexico for items shown. Tariffs for other countries for some items may be eliminated under special trade agreements.

⁶International Copper Study Group, 2005, July 2005 data: Lisbon, Portugal, International Copper Study Group press release, October 13, 1 p.

⁷See Appendix C for definitions.

⁸U.S. Geological Survey National Mineral Resource Assessment Team, 2000, 1998 assessment of undiscovered deposits of gold, silver, copper, lead, and zinc in the United States: U.S. Geological Survey Circular 1178, 21 p.