

## COPPER

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

**Domestic Production and Use:** Domestic mine production in 2007 declined nominally to 1.19 million tons, but its value rose slightly to about \$8.8 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 26 mines operating in the United States, 17 mines accounted for about 99% of production. Three primary smelters, 4 electrolytic and 3 fire refineries, and 14 solvent extraction-electrowinning facilities operated during the year. Refined copper and direct-melt scrap were consumed at about 30 brass mills; 16 rod mills; and 500 foundries, chemical plants, and miscellaneous consumers. Copper and copper alloy products were used in building construction, 51%; electric and electronic products, 19%; transportation equipment, 10%; consumer and general products, 11%; and industrial machinery and equipment, 9%.<sup>1</sup>

<b>Salient Statistics—United States:</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007<sup>e</sup></b>
Production:					
Mine	1,120	1,160	1,140	1,200	1,190
Refinery:					
Primary	1,250	1,260	1,210	1,210	1,300
Secondary	53	51	47	45	50
Copper from all old scrap	207	191	182	141	150
Imports for consumption:					
Ores and concentrates	27	23	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Refined	882	807	1,000	1,070	830
Unmanufactured	1,140	1,060	1,230	1,320	1,010
General imports, refined	687	704	977	1,070	830
Exports:					
Ores and concentrates	9	24	137	108	80
Refined	93	118	40	106	55
Unmanufactured	703	789	815	990	800
Consumption:					
Reported, refined	2,290	2,410	2,270	2,130	2,120
Apparent, unmanufactured <sup>3</sup>	2,430	2,550	2,400	2,180	2,300
Price, average, cents per pound:					
Domestic producer, cathode	85.2	133.9	173.5	314.8	335
London Metal Exchange, high-grade	80.7	130.0	166.8	304.9	329
Stocks, yearend, refined, held by U.S. producers, consumers, and metal exchanges	656	134	66	196	120
Employment, mine and mill, thousands <sup>e</sup>	6.8	7.0	7.0	7.2	7.3
Net import reliance <sup>4</sup> as a percentage of apparent consumption	40	43	42	38	37

**Recycling:** Old scrap, converted to refined metal and alloys, provided 150,000 tons of copper, equivalent to 7% of apparent consumption. Purchased new scrap, derived from fabricating operations, yielded 800,000 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-based scrap), brass mills recovered 75%; miscellaneous manufacturers, foundries, and chemical plants, 11%; ingot makers, 9%; and copper smelters and refiners, 5%. Copper in all old and new, refined or remelted scrap contributed about 32% of the U.S. copper supply.

**Import Sources (2003-06):** Unmanufactured: Chile, 39%; Canada, 32%; Peru, 15%; Mexico, 6%; and other, 8%. Refined copper accounted for 79% of unwrought copper imports.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations<sup>5</sup> 12-31-07</b>
	Copper ores and concentrates	2603.00.0000	1.7¢/kg on 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 stockpiles of refined copper and brass were liquidated in 1993 and 1994, respectively. 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, which had risen to record-high levels of more than \$4.00 per pound at mid-year 2006, fell below \$3.00 per pound during the first quarter of 2007, but rose sharply again in April, with the producer price averaging \$3.53 per pound during the second and third quarters of the year. A decline in commodity exchange inventories during the second quarter and a dramatic rise in imports of refined copper by China, the world's leading copper consumer, gave rise to concern over supply adequacy. Year-on-year apparent consumption of copper in China for the first 6 months of 2007 (excluding changes in unreported Government and industry stocks) rose by 37%. Labor strikes in Canada, Chile, Mexico, and Peru, and lower than anticipated production in Africa, Indonesia, and the United States, led to lower copper supply. According to the International Copper Study Group,<sup>6</sup> the production deficit during the first half of the year would reverse, and a modest production surplus was anticipated by yearend.

In the United States, mine production declined slightly owing to lower ore grades at a major mine, and continued labor and equipment shortages. In March, Freeport-McMoran Copper & Gold Inc. (New Orleans, LA) acquired Phelps Dodge Corp.<sup>7</sup> Production by domestic brass mills was lower during the first half of the year and was anticipated to decline sharply during the fourth quarter owing to substitution and a weak housing market. Despite lower demand, domestic production of wire rod declined only slightly during the first half of the year as the weak dollar led to a sharp reduction in imports. One copper tube producer announced it was closing one of its casting facilities, and ownership changes were announced at a major brass mill and wire and cable manufacturer. In addition to a major new mine-for-leach project in Arizona due onstream in 2008, several companies announced progress toward the startup of new projects in Arizona, Minnesota, and Montana that would add 240,000 tons per year of new mine capacity by 2009.

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

	Mine production		Reserves <sup>8</sup>	Reserve base <sup>8</sup>
	2006	2007 <sup>e</sup>		
United States	1,200	1,190	35,000	70,000
Australia	859	860	24,000	43,000
Canada	607	585	9,000	20,000
Chile	5,360	5,700	150,000	360,000
China	890	920	26,000	63,000
Indonesia	816	780	35,000	38,000
Kazakhstan	457	460	14,000	20,000
Mexico	338	400	30,000	40,000
Peru	1,049	1,200	30,000	60,000
Poland	512	470	30,000	48,000
Russia	725	730	20,000	30,000
Zambia	476	530	19,000	35,000
Other countries	1,835	1,800	65,000	110,000
World total (rounded)	15,100	15,600	490,000	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).<sup>9</sup> A preliminary assessment indicates that global land-based resources exceed 3 billion tons. 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 and 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.

<sup>e</sup>Estimated.

<sup>1</sup>Some electrical components are included in each end use. Distribution for 2006 by the Copper Development Association, Inc., 2007.

<sup>2</sup>Less than ½ unit.

<sup>3</sup>Defined as primary refined production + copper from old scrap converted to refined metal and alloys + refined imports – refined exports ± changes in refined stocks. General imports were used to calculate apparent consumption.

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

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

<sup>6</sup>International Copper Study Group, 2007, Forecast 2007-2008: Lisbon, Portugal, International Copper Study Group press release, October 2, 1 p.

<sup>7</sup>Freeport-McMoRan Copper & Gold Inc., 2007, Freeport-McMoRan Copper & Gold Inc. completes acquisition of Phelps Dodge Corp.: New Orleans, LA, Freeport-McMoRan Copper & Gold Inc. press release, March 19, 1 p.

<sup>8</sup>See Appendix C for definitions.

<sup>9</sup>U.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.