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

Domestic Production and Use: Domestic mine production in 2004 rose to 1.16 million tons and was valued at about \$3.4 billion. The principal mining States, in descending order, Arizona, Utah, and New Mexico, accounted for 99% of domestic production; copper was also recovered at mines in four other States. Although copper was recovered at 22 mines operating in the United States, just 14 mines accounted for more than 99% of production. Three primary smelters, 4 electrolytic and 3 fire refineries, and 12 solvent extraction-electrowinning facilities (may include multiple units) 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, 48%; electric and electronic products, 21%; transportation equipment, 10%; industrial machinery and equipment, 10%; and consumer and general products, 11%.¹

Salient Statistics—United States:	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004^e</u>
Production:	4 450	1.0.10	4.4.40	4 4 0 0	4 4 0 0
Mine	1,450	1,340	1,140	1,120	1,160
Refinery:					
Primary	1,590	1,630	1,440	1,250	1,280
Secondary	209	172	70	53	55
Copper from all old scrap	357	316	208	206	225
Imports for consumption:					
Ores and concentrates	$(^{2})$	46	72	27	35
Refined	1,0ÔÓ	991	927	882	800
Unmanufactured	1.350	1.400	1.230	1.140	1.060
Exports:	,	,			,
Ores and concentrates	116	45	23	9	30
Refined	94	23	26	93	120
Unmanufactured	650	556	506	703	750
Consumption:					
Reported refined	3,030	2,620	2,370	2,290	2,460
Apparent unmanufactured ³	3,100	2,500	2,610	2,430	2,640
Price, average, cents per pound:					
Domestic producer, cathode	88.2	76.9	75.8	85.2	132
London Metal Exchange, high-grade	82.2	71.6	70.7	80.7	128
Stocks, yearend, refined, held by U.S.					
producers, consumers, and metal exchanges	334	952	1,030	657	130
Employment, mine and mill, thousands	9.1	8.2	7.0	6.8	7.0
Net import reliance ⁴ as a percentage of					
apparent consumption	37	22	37	40	43

<u>Recycling</u>: Old scrap, converted to refined metal and alloys, provided 225,000 tons of copper, equivalent to 9% of apparent consumption. Purchased new scrap, derived from fabricating operations, yielded 800,000 tons of contained copper; about 86% 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 71%; copper smelters and refiners, 5%; ingot makers, 12%; and miscellaneous manufacturers, foundries, and chemical plants, 12%. Copper in all old and new, refined or remelted scrap contributed 30% of the U.S. copper supply.

Import Sources (2000-03): Unmanufactured: Canada, 28%; Chile, 26%; Peru, 23%; Mexico, 9%; and other, 14%. Refined copper accounted for 75% of unwrought copper imports.

<u>Tariff</u> : Item	Number	Normal Trade Relations ⁵ 12-31-04
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).

<u>Government Stockpile</u>: 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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COPPER

Events, Trends, and Issues: World mine production of copper rose by about 900,000 tons (6.6%) in 2004, despite a landslide that reduced output at a major mining operation in Indonesia. Chile and Peru accounted for about two-thirds of the increased output owing to increased capacities and restoration of production cut during 2003. According to projections by the International Copper Study Group,⁶ world refined copper production grew by only about 560,000 tons (3.7%), while world use grew by almost 900,000 tons (5.7%). Consequently, the production deficit, estimated at 375,000 tons in 2003, was projected to grow to 700,000 tons in 2004. Copper use in China was projected to increase by 6.6% in 2004, down from an 11.6% increase in 2003. In response to the shortage of copper, global inventories declined throughout the year, while prices rose. By the first week in October, inventories on the world commodity exchanges had fallen by about 650,000 tons, and the COMEX price peaked at \$1.47 per pound before moderating.

In the United States, Phelps Dodge Corp., in response to projected production shortfalls, increased output in the second half of the year at its Bagdad and Sierrita mines in Arizona and resumed concentrate production at its Chino Mine in New Mexico (closed in 2001).⁷ Other domestic increases resulted from a full year of operation of the Continental Mine in Montana and startup under new ownership of the Robinson Mine in Nevada in the fourth quarter (Robinson had last operated in 1999). These increases were partially offset by reductions at other operations. The copper and brass fabricating industry filed a petition with the U.S. Department of Commerce claiming that exports of scrap to China were causing a short supply of copper raw materials and seeking controls on copper scrap exports. Though the petition was accepted, Commerce subsequently found no injury had been demonstrated and rejected controls. Mine production was projected to reach 1.3 million tons in 2005 following restarts in the second half of 2004.

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

p p	Mine pr	oduction	Reserves ⁸	Reserve base ⁸
	2003	2004 ^e		
United States	1,120	1,160	35,000	70,000
Australia	830	850	24,000	43,000
Canada	558	560	7,000	20,000
Chile	4,900	5,380	140,000	360,000
China	610	620	26,000	63,000
Indonesia	979	860	35,000	38,000
Kazakhstan	485	485	14,000	20,000
Mexico	361	400	27,000	40,000
Peru	831	1,000	30,000	60,000
Poland	495	500	30,000	48,000
Russia	675	675	20,000	30,000
Zambia	330	400	19,000	35,000
Other countries	1,400	1,600	60,000	110,000
World total (rounded)	13,600	14,500	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.⁹ 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 various products, such as electrical power cables, electrical equipment, automobile radiators, and cooling/refrigeration tubing. In some applications, titanium and steel are used in heat exchangers, and steel is used for artillery shell casings. Optical fiber substitutes for copper in some telecommunications applications. Plastics also substitute for copper in water and drain pipe and plumbing fixtures.

^eEstimated.

¹Some electrical components are included in each end use. Distribution by Copper Development Association, 2003.

²Less than ¹/₂ 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 2000, 2001, 2002, 2003, and 2004, general imports of 1,020,000 tons, 1,200,000 tons, 1,060,000 tons, 687,000 tons, and 730,000 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, 2004, Forecast 2004-2005: Lisbon, Portugal, International Copper Study Group release, September 23, 1 p. ⁷Phelps Dodge Corp., 2004, Phelps Dodge is increasing copper production in 2004, 2005: Phoenix, AZ, Phelps Dodge Corp. news release, January 29, 2 p.

⁸See Appendix C for definitions.

⁹U.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.