

COPPER

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

Domestic Production and Use: In 2022, the recoverable copper content of U.S. mine production was an estimated 1.3 million tons, an increase of 6% from that in 2021, and was valued at an estimated \$11 billion, 6% less than \$11.7 billion in 2021. Arizona was the leading copper-producing State and accounted for approximately 70% of domestic output; copper was also mined in Michigan, Missouri, Montana, Nevada, New Mexico, and Utah. Copper was recovered or processed at 25 mines (17 of which accounted for more than 99% of mine production), 2 primary smelters, 2 electrolytic refineries, and 14 electrowinning facilities. An additional primary smelter and electrolytic refinery have been closed indefinitely since October 2019, and a new secondary smelter was in the process of starting up as of September. Refined copper and scrap were consumed at about 30 brass mills, 14 rod mills, and 500 foundries and miscellaneous manufacturers. Copper and copper alloy products were used in building construction, 46%; electrical and electronic products, 21%; transportation equipment, 16%; consumer and general products, 10%; and industrial machinery and equipment, 7%.¹

Salient Statistics—United States:	2018	2019	2020	2021	2022^e
Production:					
Mine, recoverable copper content	1,220	1,260	1,200	1,230	1,300
Refinery:					
Primary (from ore)	1,070	985	874	922	960
Secondary (from scrap)	41	44	43	49	40
Copper recovered from old (post-consumer) scrap ²	141	166	160	170	160
Imports for consumption:					
Ore and concentrates	32	27	2	11	15
Refined	778	663	676	919	810
Exports:					
Ore and concentrates	253	356	383	347	330
Refined	190	125	41	48	30
Consumption:					
Reported, refined metal	1,820	1,810	1,770	1,770	1,800
Apparent, primary refined and old scrap ³	1,820	1,820	1,660	1,960	1,900
Price, annual average, cents per pound:					
U.S. producer, cathode (COMEX + premium)	298.7	279.6	286.7	432.3	410
COMEX, high-grade, first position	292.6	272.3	279.9	424.3	400
London Metal Exchange, grade A, cash	296.0	272.4	279.8	422.5	400
Stocks, refined, held by U.S. producers, consumers, and metal exchanges, yearend	244	110	118	117	120
Employment, mine and plant, number	11,700	12,000	11,000	11,400	12,000
Net import reliance ⁴ as a percentage of apparent consumption	33	37	38	44	41

Recycling: Old (post-consumer) scrap, converted to refined metal, alloys, and other forms, provided an estimated 160,000 tons of copper in 2022, and an estimated 670,000 tons of copper was recovered from new (manufacturing) scrap derived from fabricating operations. Of the total copper recovered from scrap, brass and wire-rod mills accounted for approximately 85%; smelters, refiners, and ingot makers, 10%; and chemical plants, foundries, and miscellaneous manufacturers, 5%. Copper recovered from scrap contributed 32% of the U.S. copper supply.⁵

Import Sources (2018–21): Copper content of blister and anodes: Finland, 90%; and other, 10%. Copper content of matte, ash, and precipitates: Canada, 34%; Belgium, 17%; Japan, 15%; Mexico, 11%; and other, 23%. Copper content of ore and concentrates: Mexico, 82%; Canada, 18%; and other, <1%. Copper content of scrap: Canada, 51%; Mexico, 37%; and other, 12%. Refined copper: Chile, 64%; Canada, 20%; Mexico, 11%; and other, 5%. Refined copper accounted for 86% of all unmanufactured copper imports.

Tariff: Item	Number	Normal Trade Relations 12-31-22
Copper ore and concentrates, copper content	2603.00.0010	1.7¢/kg on lead content.
Unrefined copper anodes	7402.00.0000	Free.
Refined copper and alloys, unwrought	7403.00.0000	1% ad valorem.
Copper wire rod	7408.11.0000	1% or 3% ad valorem.

Depletion Allowance: 15% (domestic), 14% (foreign).

Government Stockpile: None.

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Events, Trends, and Issues: In 2022, the largest increase in mined copper output in the United States was at the Bingham Canyon Mine in Utah, where ore grades and recovery rates were higher than those in 2021 following the transition to mining a new area of the open pit. Copper production also rose significantly at the Morenci and Safford Mines in Arizona, reflecting increased mining, milling, and (or) leaching rates. Owing to labor shortages and lower copper ore grades, the most significant decrease in mined copper output was at the Mission Mine in Arizona. The rampups of the Gunnison Mine in Arizona and the Pumpkin Hollow Mine in Nevada continued to be delayed by technical issues. Refined copper production in the United States increased by an estimated 3% in 2022 compared with that in 2021 because of a greater supply of copper concentrates to the Miami smelter in Arizona, which was partially offset by unplanned stoppages and labor shortages at the Garfield smelter in Utah. A new smelter in North Carolina designed to produce copper anodes from scrap was in the process of ramping up as of September, and at least five other domestic facilities that would recover copper from scrap were expected to begin operating within the next few years. In August, a leading copper wire-rod plant in Amarillo, TX, was indefinitely shut down owing to high production costs, maintenance issues, and labor shortages.

The annual average COMEX copper price was projected to be about \$4 per pound in 2022, 6% less than that in 2021. Analysts attributed the decreased price primarily to widespread global expectations for reduced economic growth and lower demand for copper in the near future, coronavirus disease 2019 (COVID-19) mitigation measures in China, and increased strength of the United States dollar relative to other currencies.

World Mine and Refinery Production and Reserves: Reserves for Australia, Canada, Chile, China, Peru, Poland, the United States, and Zambia were revised based on company and Government reports.

	Mine production		Refinery production		Reserves ⁶
	2021	2022 ^e	2021	2022 ^e	
United States	1,230	1,300	971	1,000	44,000
Australia	813	830	385	380	797,000
Canada	550	530	287	310	7,600
Chile	5,620	5,200	2,270	2,100	190,000
China	1,910	1,900	10,500	11,000	27,000
Congo (Kinshasa)	1,740	2,200	1,450	1,700	31,000
Germany	—	—	615	620	—
Indonesia	731	920	290	300	24,000
Japan	—	—	1,510	1,600	—
Kazakhstan	510	580	500	510	20,000
Korea, Republic of	—	—	647	660	—
Mexico	734	740	473	470	53,000
Peru	2,300	2,200	336	290	81,000
Poland	391	390	578	590	30,000
Russia	^e 940	1,000	981	1,100	62,000
Zambia	842	770	354	350	19,000
Other countries	<u>2,850</u>	<u>3,400</u>	<u>3,170</u>	<u>3,000</u>	<u>200,000</u>
World total (rounded)	21,200	22,000	25,300	26,000	890,000

World Resources:⁶ A U.S. Geological Survey study of global copper deposits indicated that, as of 2015, identified resources contained 2.1 billion tons of copper, and undiscovered resources contained an estimated 3.5 billion tons.⁸

Substitutes: Aluminum substitutes for copper in automobile radiators, cooling and refrigeration tube, electrical equipment, and power cable. Titanium and steel are used in heat exchangers. Optical fiber substitutes for copper in telecommunications applications, and plastics substitute for copper in drain pipe, plumbing fixtures, and water pipe.

^eEstimated. — Zero.

¹Distribution reported by the Copper Development Association.

²Copper converted to refined metal, alloys, and other forms by brass and wire-rod mills, foundries, refineries, and other manufacturers.

³Primary refined production + copper recovered from old scrap + refined imports – refined exports ± refined copper stock change.

⁴Defined as refined imports – refined exports ± refined copper stock change.

⁵Primary refined production + copper recovered from old and new scrap + refined imports – refined exports ± refined copper stock change.

⁶See Appendix C for resource and reserve definitions and information concerning data sources.

⁷For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 23 million tons.

⁸Source: Hammarstrom, J.M., Zientek, M.L., Parks, H.L., Dicken, C.L., and the U.S. Geological Survey Global Copper Mineral Resource Assessment Team, 2019, Assessment of undiscovered copper resources of the world, 2015 (ver.1.1, May 24, 2019): U.S. Geological Survey Scientific Investigations Report 2018–5160, 619 p., <https://doi.org/10.3133/sir20185160>.