

COPPER

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

Domestic Production and Use: In 2021, the recoverable copper content of U.S. mine production was an estimated 1.2 million tons, unchanged from that in 2020, and was valued at an estimated \$12 billion, 58% greater than \$7.61 billion in 2020. Arizona was the leading copper-producing State and accounted for an estimated 71% of domestic output; copper was also mined in Michigan, Missouri, Montana, Nevada, New Mexico, and Utah. Copper was recovered or processed at 25 mines (19 of which accounted for 99% of mine production), 2 smelters, 2 electrolytic refineries, and 14 electrowinning facilities. An additional smelter and electrolytic refinery have been temporarily closed since October 2019. Refined copper and scrap were used at about 30 brass mills, 14 rod mills, and 500 foundries and miscellaneous consumers. 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

<u>Salient Statistics—United States:</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021^e</u>
Production:					
Mine, recoverable copper content	1,260	1,220	1,260	1,200	1,200
Refinery:					
Primary (from ore)	1,040	1,070	985	874	950
Secondary (from scrap)	40	41	44	43	50
Copper recovered from old (post-consumer) scrap ²	146	149	^e 150	^e 150	160
Imports for consumption:					
Ore and concentrates	14	32	27	2	13
Refined	813	778	663	676	920
Exports:					
Ore and concentrates	237	253	353	383	360
Refined	94	190	125	41	50
Consumption:					
Reported, refined metal	1,800	1,820	1,830	1,710	1,800
Apparent, primary refined and old scrap ³	1,860	1,830	1,810	1,650	2,000
Price, annual average, cents per pound:					
U.S. producer, cathode (COMEX + premium)	285.4	298.7	279.6	286.7	430.0
COMEX, high-grade, first position	280.4	292.6	272.3	279.9	420.0
London Metal Exchange, grade A, cash	279.5	296.0	272.4	279.8	420.0
Stocks, refined, held by U.S. producers, consumers, and metal exchanges, yearend	265	244	111	118	80
Employment, mine and plant, number	10,500	11,700	12,000	11,000	11,000
Net import reliance ⁴ as a percentage of apparent consumption	36	33	37	38	45

Recycling: Old (post-consumer) scrap, converted to refined metal and alloys, provided an estimated 160,000 tons of copper. Purchased new (manufacturing) scrap, derived from fabricating operations, yielded an estimated 710,000 tons. Of the total copper recovered from scrap (including non-copper-base scrap), brass and wire-rod mills accounted for about 80%; smelters, refiners, and ingot makers, 15%; and miscellaneous chemical plants, foundries, and manufacturers, 5%. Copper recovered from scrap contributed about 32% of the U.S. copper supply.⁵

Import Sources (2017–20): Copper content of blister and anodes: Finland, 81%; Malaysia, 13%; and other, 6%. Copper content of matte, ash, and precipitates: Canada, 28%; Mexico, 20%; Belgium, 14%; Spain, 11%; and other, 27%. Copper content of ore and concentrates: Mexico, 97%; and other, 3%. Copper content of scrap: Canada, 54%; Mexico, 34%; and other, 12%. Refined copper: Chile, 62%; Canada, 23%; Mexico, 11%; and other, 4%. Refined copper accounted for 85% of all unmanufactured copper imports.

<u>Tariff:</u>	<u>Item</u>	<u>Number</u>	<u>Normal Trade Relations</u>
			<u>12–31–21</u>
	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	1.0% ad valorem.
	Copper wire rod	7408.11.0000	1.0% or 3.0% ad valorem.

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

Government Stockpile: None.

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Events, Trends, and Issues: In the United States, mined copper production remained unchanged in 2021 from that in 2020. Production increased significantly at the Safford Mine in Arizona owing to the rampup of the Lone Star expansion that was completed in the second half of 2020. Operations at the Chino Mine in New Mexico, which had been suspended since April 2020 after multiple workers tested positive for COVID-19, restarted in the first quarter of 2021. At the Pinto Valley Mine in Arizona, optimization projects completed in 2020 and 2021 resulted in higher copper recovery and throughput rates. Production also increased at other domestic copper mines because of higher ore grades, but the increases were offset by significant decreases in output at several major mines in Arizona. The rampup of the Gunnison Mine in Arizona, which commenced production in late 2020, was delayed because of technical complications with the injection wells. Production at the Pumpkin Hollow Mine in Nevada, which started in late 2019 and was halted for several months in 2020 because of the COVID-19 pandemic, was expected to reach capacity in the third quarter of 2022. Refined copper production in the United States increased by an estimated 9% in 2021 compared with that in 2020, when operations at the smelter in Utah were affected by a rebuild of the flash converting furnace after an earthquake and a delayed restart following planned maintenance.

Based on data through October, the annual average COMEX copper price was projected to be about \$4.20 per pound in 2021, an increase of 50% from that in 2020 and 5% greater than the previous alltime high of \$4.01 per pound in 2011. Strong global manufacturing activity, constrained growth in world copper production, low stockpiles, and supply constraints owing to shipping delays contributed to the increased copper price.

World Mine and Refinery Production and Reserves: Reserves for multiple countries were revised based on company and (or) Government information.

	Mine production		Refinery production		Reserves ⁶
	2020	2021 ^e	2020	2021 ^e	
United States	1,200	1,200	918	1,000	48,000
Australia	885	900	427	450	⁷ 93,000
Canada	585	590	^e 290	300	9,800
Chile	5,730	5,600	2,330	2,200	200,000
China	1,720	1,800	10,000	10,000	26,000
Congo (Kinshasa)	1,600	1,800	1,350	1,500	31,000
Germany	—	—	643	630	—
Indonesia	505	810	269	270	24,000
Japan	—	—	1,580	1,500	—
Kazakhstan	552	520	515	470	20,000
Korea, Republic of	—	—	671	650	—
Mexico	733	720	492	470	53,000
Peru	2,150	2,200	324	350	77,000
Poland	393	390	560	590	31,000
Russia	^e 810	820	1,040	920	62,000
Zambia	853	830	378	350	21,000
Other countries	<u>2,840</u>	<u>2,800</u>	<u>3,450</u>	<u>4,300</u>	<u>180,000</u>
World total (rounded)	20,600	21,000	25,300	26,000	880,000

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. Some electrical components are included in each end use.

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

³Primary refined production + copper in old scrap converted to refined metal and alloys + refined imports – refined exports ± refined stock changes.

⁴Defined as refined imports – refined exports ± adjustments for refined copper stock changes.

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

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.

⁸Hammarstrom, 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>.