

COPPER

(Data in thousand metric tons, copper content, unless otherwise specified)

Domestic Production and Use: In 2023, the recoverable copper content of U.S. mine production was an estimated 1.1 million tons, a decrease of 11% from that in 2022, and was valued at an estimated \$9.9 billion, 11% less than \$11.2 billion in 2022. 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, 1 secondary smelter, 2 primary electrolytic refineries, 14 electrowon refineries, and 3 secondary fire refineries. A new secondary copper refinery was expected to startup by yearend. Refined copper and scrap were consumed at about 30 brass mills, 14 rod mills, and 500 foundries and miscellaneous manufacturers. According to the Copper Development Association, copper and copper alloy products were used in building construction, 45%; electrical and electronic products, 22%; transportation equipment, 16%; consumer and general products, 10%; and industrial machinery and equipment, 7%.

| Salient Statistics—United States: | 2019 | 2020 | 2021 | 2022 | 2023^e |
|--|-------------|-------------|-------------|------------------|-------------------------|
| Production: | | | | | |
| Mine, recoverable | 1,260 | 1,200 | 1,230 | 1,230 | 1,100 |
| Refinery: | | | | | |
| Primary (from ore) | 985 | 872 | 922 | 912 | 850 |
| Secondary (from scrap) | 44 | 43 | 49 | 40 | 40 |
| Copper recovered from old (post-consumer) scrap ¹ | 166 | 161 | 157 | ^e 150 | 150 |
| Imports for consumption: | | | | | |
| Ore and concentrates | 27 | 2 | 11 | 12 | 4 |
| Refined | 663 | 676 | 919 | 732 | 890 |
| Exports: | | | | | |
| Ore and concentrates | 356 | 383 | 344 | 353 | 350 |
| Refined | 125 | 41 | 48 | 28 | 30 |
| Consumption: | | | | | |
| Reported, refined copper | 1,810 | 1,680 | 1,750 | 1,720 | 1,700 |
| Apparent, primary refined copper and copper from old scrap ² | 1,820 | 1,660 | 1,950 | 1,800 | 1,800 |
| Price, annual average, cents per pound: | | | | | |
| U.S. producer, cathode (COMEX + premium) | 279.6 | 286.7 | 432.3 | 410.8 | 400 |
| COMEX, high-grade, first position | 272.3 | 279.9 | 424.3 | 400.7 | 390 |
| London Metal Exchange, grade A, cash | 272.4 | 279.8 | 422.5 | 399.8 | 390 |
| Stocks, refined, held by U.S. producers, consumers, and metal exchanges, yearend | 110 | 118 | 117 | 83 | 100 |
| Employment, mine and plant, number | 12,000 | 11,000 | 11,400 | 12,000 | 12,000 |
| Net import reliance ³ as a percentage of apparent consumption | 37 | 38 | 45 | 41 | 46 |

Recycling: Old (post-consumer) scrap, converted to refined metal, alloys, and other forms, provided an estimated 150,000 tons of copper in 2023, and an estimated 700,000 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 80%. Copper recovered from scrap contributed 33% of the U.S. copper supply.⁴

Import Sources (2019–22): Copper content of blister and anodes: Finland, 93%; and other, 7%. Copper content of matte, ash, and precipitates: Canada, 37%; Belgium, 21%; Japan, 16%; Spain, 11%; and other, 15%. Copper content of ore and concentrates: Mexico, 52%; Canada, 48%; and other, <1%. Copper content of scrap: Canada, 48%; Mexico, 40%; and other, 12%. Refined copper: Chile, 64%; Canada, 18%; Mexico, 11%; and other, 7%. Refined copper accounted for 86% of all unmanufactured copper imports.

| Tariff: | Item | Number | Normal Trade Relations 12–31–23 |
|----------------|---|---------------|--|
| | 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 scrap | 7404.00.0000 | Free. |
| | 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 2023, production decreased at a majority of copper mines in the United States, and domestic mined copper output declined by an estimated 11% from that in 2022. At the Bingham Canyon Mine in Utah, copper production was affected by record-high snowfall in the first quarter and a conveyor belt motor failure that resulted in the concentrator operating at a reduced capacity for several months. At the Robinson Mine in Nevada, low-grade copper ores were processed owing to planned mine sequencing. Production also decreased at multiple mines in Arizona and New Mexico because of unplanned maintenance and lower ore grades and mining rates. The rampups of the Gunnison Mine in Arizona and the Pumpkin Hollow Mine in Nevada continued to be delayed, but ore processing restarted at Pumpkin Hollow in October following a suspension of over a year to address geotechnical challenges. Copper production at U.S. refineries decreased by an estimated 7% in 2023 compared with that in 2022 because of a major rebuild of the smelter and electrolytic refinery near Salt Lake City, UT, from May to September. A new refinery in Kentucky designed to produce copper cathodes from scrap was anticipated to begin operating by yearend 2023, and at least three other domestic facilities that would recover copper from scrap in the form of anodes or cathodes were expected to start within the next several years.

The annual average COMEX copper price was projected to be about \$3.90 per pound in 2023, 3% less than that in 2022. Analysts attributed the decreased price primarily to strengthening of the U.S. dollar relative to other global currencies and concerns regarding economic growth in China and inflation.

World Mine and Refinery Production and Reserves: Reserves for Australia, China, Congo (Kinshasa), Peru, Poland, Russia, the United States, Zambia, and “Other countries” were revised based on company and Government reports.

| | Mine production | | Refinery production | | Reserves ⁵ |
|-----------------------|------------------|-------------------|---------------------|-------------------|-----------------------|
| | 2022 | 2023 ^e | 2022 | 2023 ^e | |
| United States | 1,230 | 1,100 | 952 | 890 | 50,000 |
| Australia | 819 | 810 | 401 | 450 | ⁶ 100,000 |
| Canada | 520 | 480 | 278 | 310 | 7,600 |
| Chile | 5,330 | 5,000 | 2,150 | 2,000 | 190,000 |
| China | 1,940 | 1,700 | 11,100 | 12,000 | 41,000 |
| Congo (Kinshasa) | 2,350 | 2,500 | 1,770 | 1,900 | 80,000 |
| Germany | — | — | 609 | 610 | — |
| Indonesia | 941 | 840 | 310 | 200 | 24,000 |
| Japan | — | — | 1,550 | 1,500 | — |
| Kazakhstan | 593 | 600 | 494 | 440 | 20,000 |
| Korea, Republic of | — | — | 638 | 620 | — |
| Mexico | 754 | 750 | 486 | 480 | 53,000 |
| Peru | 2,450 | 2,600 | 391 | 400 | 120,000 |
| Poland | 393 | 400 | 586 | 590 | 34,000 |
| Russia | ^e 936 | 910 | ^e 1,010 | 1,000 | 80,000 |
| Zambia | 797 | 760 | 349 | 380 | 21,000 |
| Other countries | <u>2,850</u> | <u>3,100</u> | <u>2,830</u> | <u>2,900</u> | <u>180,000</u> |
| World total (rounded) | 21,900 | 22,000 | 25,900 | 27,000 | 1,000,000 |

World Resources:⁵ The most recent U.S. Geological Survey assessment of global copper resources indicated that, as of 2015, identified resources contained 2.1 billion tons of copper and undiscovered resources contained an estimated 3.5 billion tons.⁷

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

^eEstimated. — Zero.

¹Copper converted to refined metal, alloys, and other forms by brass and wire-rod mills, foundries, refineries, and other manufacturers.

²Primary refined production + copper recovered from old scrap + refined imports – refined exports ± adjustments for refined copper stock changes.

³Defined as refined imports – refined exports ± adjustments for refined copper stock changes.

⁴Primary refined production + copper recovered from old and new scrap + refined imports – refined exports ± adjustments for refined copper stock changes.

⁵See Appendix C for resource and reserve definitions and information concerning data sources.

⁶For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 27 million tons.

⁷Source: 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>.