



# 2013 Minerals Yearbook

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In 2013, the United States remained the fourth-ranked mine producer of copper behind Chile, China, and Peru, and accounted for about 7% of global production (table 20). U.S. mine production of recoverable copper increased to 1.25 million metric tons (Mt), about 7% greater than that of 2012, and the highest since 2008, when production was 1.31 Mt. The principal mining States for copper were, in descending order of production, Arizona, Utah, New Mexico, Nevada, and Montana, and accounted for more than 99% of domestic production; copper was also recovered at mines in Idaho and Missouri. Although copper was recovered at 27 mines in the United States during 2013, 20 mines accounted for more than 99% of production (table 2). The remaining mines were either small leach operations or byproduct producers of copper.

Global mine production increased by about 8% to 18.3 Mt. Chile increased mined copper production by 6% and remained the leading world producer. It accounted for 32% of global production and produced about 4.2 Mt more than the second-ranked producer, China, which accounted for 9% of global production. China surpassed the United States in 2010 to become the third-ranked producer and surpassed Peru in 2011 to become the second-ranked producer of mined copper. The remaining 10 leading producers after the United States, in descending order of production, were Australia, Congo (Kinshasa), Russia, Zambia, Canada, and Indonesia. Fifty-one countries were known to have mined copper in 2013. The 10 leading producers accounted for 80% of production, and the 20 leading producers accounted for 94% of production (table 20).

Global smelter production increased by 6% in 2013, and refinery production rose by 4% owing to across-the-board increases in primary electrolytic, electrowon, and secondary refinery production. The United States ranked 9th in copper smelter production, up from 10th in 2012, and accounted for 3% of world production. The United States accounted for 5% of world refined copper production and remained the fourth leading producer behind China (31%), Chile (13%), and Japan (7%) (tables 21, 22).

In 2013, copper recovered from refined or remelted scrap in the United States totaled 796,000 metric tons (t) (about 79% from new scrap and 21% from old scrap) and accounted for 32% of the total U.S. copper supply. The conversion of old scrap to alloys and refined copper increased slightly to 166,000 t and was at its highest level since 2005 (tables 1, 6). In addition to scrap consumed domestically, an additional 1.16 Mt of scrap (gross weight) was exported, the majority of which was thought to be old scrap (table 18). Copper scrap exports were about 6% lower than the record-high exports in 2011, which had corresponded with a record-high annual average price for copper. Copper was consumed as refined copper and as direct

melt scrap at about 30 brass mills; 15 wire-rod mills; and 500 chemical plants, foundries, and miscellaneous operations.

According to data compiled by the International Copper Study Group (ICSG) (2015, p. 9, 19–20), global consumption of refined copper in 2013 increased by about 4% and reached an alltime high of 21.4 Mt, principally owing to a 9% increase in China's apparent consumption, to about 9.7 Mt, which accounted for about 45% of total global consumption. From 2001 to 2013, global consumption increased by 43%, a compounded average of about 3% per year, with slight decreases in 2005 and 2008. In 2013, consumption increased slightly in Asia (excluding China), declined slightly in the European Union, and increased by 4% in North America. Consumption in the European Union accounted for 14% of total global consumption, and consumption in North America accounted for 11%. Consumption in the United States increased by 4% and accounted for 9% of total global consumption. The ICSG calculation of China's apparent consumption was based on reported production, trade, and Shanghai Futures Exchange (SHFE) stock data, and did not include unreported Government or industry stocks, which can fluctuate significantly on an annual basis.

According to ICSG estimates, global consumption of refined copper exceeded production by 270,000 t in 2013. This was the fourth consecutive year that global consumption of refined copper was greater than global production. Reported global yearend inventories of refined copper decreased by 4% to 1.3 Mt, about 6% of annual consumption of 21.4 Mt of refined copper. If the estimated decrease in unreported inventories in China (which would increase the country's apparent consumption estimate) were taken into account, the apparent refined production deficit in 2013 would be more than 500,000 t (International Copper Study Group, 2015, p. 9, 28–29).

In 2013, the average annual Commodity Exchange, Inc. (COMEX) spot price declined by about 8% to \$3.34 per pound of copper. The annual average copper price had reached a record high of \$4.06 per pound in 2011 but declined to \$3.61 in 2012 (table 1). In 2013, the daily spot price ranged from a high of \$3.78 per pound on February 1 to a low of \$3.03 per pound on June 24.

## Legislation and Government Programs

In December 2012, the U.S. Securities and Exchange Commission (SEC) approved the establishment of JPMorgan Chase & Co.'s XF Physical Copper Trust and in February 2013, approved the creation of BlackRock Inc.'s iShares Copper Trust. The XF Physical Copper Trust was the first physical copper exchange traded fund (ETF) approved in the United

States, and JPMorgan Chase planned to hold about 62,000 t of physical copper cathode as collateral against shares of the fund. The iShares Copper Trust planned to hold 121,000 t of physical copper. Although the total amount of copper to be held by these ETFs was small in relation to the total copper market, it was almost equal to the total amount of copper metal held in COMEX- and London Metal Exchange (LME)-approved bonded warehouses in the United States at yearend 2012 and equal to about 92% of the copper held in these warehouses at yearend 2013 (Mason, 2012; U.S. Securities and Exchange Commission, 2012, p. 28; 2013, p. 25; Burton and Shen, 2013).

Southwire Co., a leading U.S. producer of copper wire rod, filed a lawsuit seeking to prevent the establishment of the copper ETFs. Southwire and other copper consumers opposed creation of the ETFs, concerned that the copper in ETFs would be unavailable to the market and could result in higher copper prices and reduced copper availability during periods of high demand. Consumers contended that the copper purchased for the ETFs would otherwise be held in commodity exchange warehouses and be available for immediate delivery. They also claimed that this was an important source of copper supply during periods of high demand because a significant amount of metal outside of the commodity exchange networks was purchased through long-term contracts (Mason, 2013). By yearend, however, neither of the ETFs had been launched.

In July, JPMorgan Chase announced that it would sell its commodities business, which included the warehousing unit Henry Bath and Son Ltd., where the copper for the XF Physical Copper Trust would have been stored. After having acquired Henry Bath in 2010, JPMorgan Chase had been required by the U.S. Federal Reserve System to either divest the warehousing company by July 2013, now extended by the U.S. Federal Reserve to July 2014, or restructure it as a passive investment over which it exercised no operational control. Also during the summer, The Goldman Sachs Group Inc. withdrew its warehousing unit as the custodian for the copper used as collateral for BlackRock's ETF. In October 2013, Southwire dropped its lawsuit seeking to prevent the establishment of the copper ETFs, claiming that it was now unlikely that the ETFs would ever be listed owing to increased political and regulatory scrutiny and changes to the mechanisms that were to be used to store the copper (Mason, 2013).

## Production

**Domestic Industry Structure.**—Mine production of recoverable copper in the United States increased by 7% to 1.25 Mt in 2013 as production in Arizona increased by 4% and output in other States increased by 12%, mainly owing to significant increases in production in New Mexico and Utah. The copper yield of concentrated copper ore increased by 11%, to 0.40%. Smelter and electrolytically refined copper production increased by 6% each. Electrowon copper production from leach solutions was essentially unchanged and accounted for 38% and 48%, respectively, of mine and refinery production (table 1). Fifteen solvent extraction–electrowinning (SX–EW) facilities operated during 2013.

Domestic production data were based on information compiled from U.S. Geological Survey (USGS) monthly

surveys sent to 27 mine producers of copper, 3 copper smelters, and 3 electrolytic copper refineries. In 2013, responses were received from 26 of the surveyed mines, and from all the smelters and refineries.

**Operating Property Reviews.**—ASARCO LLC (Phoenix, AZ) produced 48,700 t of electrowon copper at its Ray (28,800 t) and Silver Bell (19,900 t) Mines in Arizona. The Ray Mine produced 74,200 t of copper in concentrate and the Mission Mine (Arizona) produced 52,600 t. Expansion of the Mission Mine concentrator was completed in the fourth quarter of 2013 and was expected to increase production capacity at Mission to 77,500 metric tons per year (t/yr) of copper in concentrate in 2014 from 66,000 t/yr in 2013 (Grupo México, S.A.B. de C.V., 2013, p. 61; 2014, p. 34).

On October 11, Capstone Mining Corp. (Vancouver, British Columbia, Canada) completed the purchase of the Pinto Valley Mine in Arizona from BHP Billiton (Melbourne, Victoria, Australia, and London, United Kingdom). In 2013, the Pinto Valley Mine produced about 42,000 t of copper in concentrate (500 t in 2012) and 4,000 t of copper cathode (5,000 t in 2012) from its residual leach operation. Concentrate production increased significantly following the restart of mining in December 2012 after having been halted in January 2009, following the global economic slowdown and a decline in copper prices (BHP Billiton, 2009, p. 28, 30; 2012; 2013, p. 9; 2014, p. 14; Capstone Mining Corp., 2014, p. 21).

Production of copper at Freeport-McMoRan Copper & Gold Inc.'s (FCX) U.S. operations increased to 692,000 t in 2013 from 660,000 t in 2012 and accounted for 55% of recoverable copper produced in the United States in 2013. In Arizona, the Bagdad Mine increased output by 10% to 98,000 t, the Sierrita Mine increased output by 9% to 77,600 t, and the Morenci Mine increased production by 5% to 301,000 t. Production at the Safford Mine decreased by 17% to 66,200 t, and output at the Miami Mine decreased by 8% to 27,700 t. In New Mexico, the Chino Mine increased production by 19% to 77,600 t of copper in 2013 as production ramped up after the mine was restarted in 2011, and the Tyrone Mine increased production by 16% to 43,500 t (Freeport-McMoRan Copper & Gold Inc., 2014b, p. 7–12, 29).

FCX was expanding the mining and milling capacity of sulfide ores at its Morenci Mine. When completed, the project was projected to increase milling rates to 115,000 metric tons per day (t/d) from 50,000 t/d and production of copper in concentrate by 100,000 t/yr. By the end of 2013, FCX had spent \$1.0 billion on the project and expected to spend an additional \$0.6 billion. Construction was reportedly more than 60% complete and was expected to be completed in the first half of 2014 (Freeport-McMoRan Copper & Gold Inc., 2014a, p. 43; 2014b, p. 25).

At Kennecott Utah Copper Corp.'s (Magna, UT) Bingham Canyon Mine, a rock slide on April 10 temporarily halted production, with limited mining restarting on April 27. Ore grades in 2013 increased to 0.55% from 0.42% in 2012, and this, along with rapid recovery from the rock slide, allowed the mine to increase production by 29% to 211,000 t of copper in concentrate from 163,200 t in 2012. Production of refined copper at the Kennecott refinery increased by 19% to 193,600 t

from 162,700 t in 2012, mainly owing to a 26-day maintenance shutdown at the Kennecott smelter during the second quarter of 2012 that interrupted the supply of anodes to the refinery during 2012. Rio Tinto plc (London, United Kingdom) was investing \$660 million to push back the south wall of the mine and extend the life of the Bingham Canyon Mine to 2030 from 2018. After completing the push back, Bingham Canyon was expected to produce an average of 180,000 t/yr of copper in concentrate from 2019 to 2029 (Rio Tinto plc, 2012, p. 3; 2013a, p. 87; 2013b, p. 3; 2014a, p. 28, 29, 213; 2014b, p. 3, 22).

In 2013, KGHM International Ltd.'s (Vancouver) Robinson Mine (Nevada) decreased production to 48,900 t of copper in concentrate from 54,200 t in 2012 owing in part to a lower average ore grade of 0.42% (0.54% in 2012). KGHM's Carlota Mine (Arizona) decreased production to 9,660 t of copper in concentrate in 2013 from 10,400 t in 2012 mainly owing to the implementation of a mine-for-closure plan that reduced ore production. KGHM expected mining to be completed at Carlota in the second quarter of 2014 with residual leaching continuing for an additional 2.5 years (KGHM International Ltd., 2014, p. 6, 10, 19).

Mercator Minerals Ltd.'s (Kingman, AZ, and Vancouver) Mineral Park Mine (Arizona) decreased production by 8% to 17,100 t of copper (1,400 t from SX-EW and 15,700 t contained in concentrate) from 18,550 t (1,630 t from SX-EW and 16,920 t contained in concentrate) in 2012. On September 30, Mercator announced that, owing to challenges the company faced with commodity prices and capital market conditions, the board of directors was considering strategic alternatives, which included the sale of the company. On December 12, Mercator announced that it had entered into an agreement with Intergeo MMC Ltd. (British Virgin Islands) to combine the two companies' assets and create a copper-focused base metals company. Approval was required from the Russian Federal Anti-Monopoly Services (FAS) because Intergeo was part of ONEXIM Group, which was headquartered in Russia. The FAS examination caused the merger of the two companies to be delayed through the first half of 2014 (Mercator Minerals Ltd., 2013a; 2013b; 2014a, p. 25; 2014b).

On December 17, 2012, Revett Minerals, Inc. (Spokane Valley, WA) suspended production at its underground Troy Mine (Montana) owing to concerns about geotechnical conditions. Although the company installed equipment to monitor ground conditions and hoped to reopen the mine as soon as possible, the mine remained idle at yearend 2013 (Revett Minerals, Inc., 2012).

On October 30, Newmont Mining Corp. (Denver, CO) announced that the Phoenix Copper Leach Project in Nevada had begun commercial production. The project was estimated to have produced only a small amount of copper cathode in 2013, but was expected to produce about 9,000 t/yr of copper from materials previously mined and considered waste rock during the project's first 5 years (Newmont Mining Corp., 2013).

## Consumption

U.S. reported consumption of refined copper increased by 4% in 2013. Consumption by wire-rod producers, which accounted for 72% of reported consumption, increased slightly, and consumption at brass mills, which accounted for about

25% of consumption, increased by 8% (table 5). According to data compiled by the American Bureau of Metal Statistics, Inc. (ABMS) (2014), domestic apparent consumption of wire rod increased by 3.7% to 1.27 Mt.

According to preliminary data from the Copper Development Association Inc. (2014, p. 18), the total shipments of copper and copper-alloy products to the U.S. market by fabricators (brass mills, foundries, powder producers, and wire mills), which included domestic product shipments and net imports, increased slightly to 4.72 Mt from 4.66 Mt in 2012. Since 2000, when shipments to the domestic market reached a record-high 8.68 Mt, shipments to the domestic market have trended downward and shipments in 2013 were 46% below those in 2000. Domestic wire-mill products accounted for about 56% of total shipments to the domestic market; brass mill products, 39%; and foundry and powder products, 3%. Net imports, which have also trended downward from a peak of 6% in 2000, made up the remaining 2%. Shipments to the building construction sector, which remained the leading end-use market, were essentially unchanged and accounted for about 43% of shipments. Shipments to the electric and electronic products sector (19% market share) decreased by 4%; shipments to the transportation equipment sector (19% market share) and shipments to the industrial machinery and equipment sector (7% market share) increased by 6%; and shipments to the consumer and general products sector (12% market share) increased by 4%.

## Prices and Stocks

In 2013, for the second consecutive year, the average annual COMEX spot price declined, decreasing by about 8% to \$3.34 per pound from \$3.61 per pound in 2012 and by 17% from the record high of \$4.00 per pound in 2011. In 2013, the monthly average price ranged from a high of \$3.67 per pound in January to a low of \$3.14 per pound in July and averaged \$3.34 per pound in December. Daily prices ranged from a high of \$3.78 per pound on February 1 to a low of \$3.03 per pound on June 24 and ended the year at \$3.44 per pound. Owing to a relatively tight market balance throughout the year, prices fluctuated in response to industry news, especially as it related to China's apparent demand. Speculation about U.S. Federal Reserve System policy was also reportedly an influence on copper price fluctuations. In November, the monthly average price declined slightly, to \$3.22 per pound, after investors reportedly expected the U.S. Federal Reserve to begin to taper its economic stimulus program by gradually reducing its bond purchases, which could have strengthened the U.S. dollar. International copper contracts were priced in U.S. dollars and a strengthening of the U.S. dollar would effectively raise the price of copper for international consumers. At the end of December, the Board of Governors of the U.S. Federal Reserve System announced that the tapering of economic stimulus would begin in January 2014. Total U.S. refined copper stocks increased by 10% during the year to 258,000 t at the end of December from 236,000 t at the beginning of January, having risen early in the year to a high of 325,000 t at the end of April (Board of Governors of the Federal Reserve System, 2013; Thomson Reuters, 2013, p. 10; International Copper Study Group, 2015, p. 9).



Copper scrap prices (table 13) generally followed the trend in refined copper prices. According to American Metal Market price data, however, with lower refined copper prices, the discount of most grades of copper scrap to refined copper decreased and the discount for refiners' No. 2 scrap from the COMEX spot price averaged 27.9 cents per pound in 2013, 39.1 cents per pound in 2012, and 49.3 cents per pound in 2011. In 2013, the refiners' No. 2 scrap discount ranged between 35.6 cents per pound in February and 22.2 cents per pound in both July and August and the price averaged \$3.06 per pound, 5% less than in 2012.

## Foreign Trade

Net imports of refined copper in 2013 were 620,000 t, an increase of about 32% (149,000 t) compared with those in 2012. Refined copper accounted for 96% of all unmanufactured copper imports. Chile, Canada, and Mexico were the leading sources of refined copper imports in 2013, accounting for 63%, 23%, and 8%, respectively, of refined imports. Exports of copper ore and concentrates increased by 16%, and exports of refined copper decreased by 29% (tables 14, 16).

According to U.S. Census Bureau data compiled by the Copper and Brass Fabricators Council Inc., in 2013, U.S. imports of copper and copper-alloy semifabricated products (excluding wire-rod mill products) were 223,000 t (essentially the same as those in 2012), exports were 118,000 t (a 9% increase from those in 2012), and the resulting net imports decreased by about 8% to 105,000 t. The leading import sources were Germany (22%), the Republic of Korea (16%), Mexico (10%), Canada (9%), and China (8%). The leading export destinations were Mexico (32%), Canada (30%), and the Republic of Korea (7%) (Copper and Brass Fabricators Council Inc., 2013, p. 1–10; 2014, p. 1–10).

Copper scrap was the leading U.S. copper export and combined copper-alloy and unalloyed scrap exports were greater in terms of quantity than all other unmanufactured copper exports combined (tables 14, 18). U.S. scrap exports increased by 138% to a total of 1.16 Mt (450,000 t of unalloyed copper scrap and 706,000 t of copper-alloy scrap) in 2013, compared with 486,000 t of scrap (228,000 t of unalloyed copper scrap and 258,000 t of copper-alloy scrap) in 2000. In 2011, total U.S. scrap exports reached a record high of 1.24 Mt, with 941,000 t of those exports going to China. U.S. scrap exports to China have increased along with total U.S. scrap exports, and in 2013, China was the recipient of 71% of U.S. unalloyed copper scrap exports and 74% of alloyed copper scrap exports in terms of quantity, and 65% and 71%, respectively, in terms of value. Shipments of unalloyed copper scrap to China increased to 320,000 t in 2013 from 124,000 t in 2000, and shipments of copper-alloy scrap increased to 523,000 t in 2013 from 86,100 t in 2000. The increase in total U.S. scrap exports and rising demand in China correlated with the shutdown of U.S. secondary smelting capacity. In 2001, the last active secondary copper smelter in the United States shut down, which decreased domestic capability to process certain grades of copper scrap. Contraction of the U.S. brass mill industry also reduced demand for direct-melt copper and copper-alloy scrap. In 2013, brass mills consumed 697,000 t of copper and brass scrap, down from 1.07 Mt in 2000. Fire-refining of copper scrap continued

in the United States but requires higher purity copper scrap than secondary smelting and generally yields a lower grade refined material. Also, with higher copper prices, copper scrap became more valuable, more scrap was collected, and more scrap was available for export. Based on global import data for 2013 (International Copper Study Group, 2015, p. 40–41), China was the recipient of 59% of the reported 7.4 Mt of global copper scrap trade.

## World Review

World mine production of copper increased by about 8% in 2013 from that in 2012 to a record-high 18.3 Mt. Unlike many other commodities, world copper production did not decrease during the 2008–09 economic downturn, and world production increased by 14% from that in 2009. According to data compiled by the ICSG (2015, p. 9), world capacity increased by 800,000 t in 2013 and by 1.7 Mt (9%) from 2009 [19.1 million metric tons per year (Mt/yr)] to 2013 (20.8 Mt/yr). Based on ICSG production and capacity data, capacity utilization at copper mines worldwide increased to 87.1% in 2013 from 83.5% in 2012.

Chile was the leading producer of mined copper in 2013 and produced 5.8 Mt, or 32% of total world production. Other leading producers were China, 1.6 Mt (9%); Peru, 1.4 Mt (8%); and the United States, 1.3 Mt (7%). Significant production increases took place in Brazil (by 47,000 t), Canada (by 52,000 t), Chile (by 342,000 t), Congo (Kinshasa) (by 310,000 t), Indonesia (by 110,000 t), Mongolia (by 65,000 t), Peru (by 77,000 t), the United States (by 80,000 t), and Zambia (by 70,000 t). The most significant decreases in production were in Argentina (by 26,000 t), Iran (by 22,000 t), and Mexico (by 20,000 t) (table 20).

Global smelter production increased by 6% to 17.1 Mt (table 21). According to ICSG data (2014, p. 15), global smelter capacity increased by about 4% in 2013 to 19.7 Mt/yr, and capacity utilization increased slightly to 87% in 2013 from 85% in 2012.

In 2013, world production of refined copper increased by about 4% to 21.0 Mt owing to increases in both primary and secondary production. Production of refined copper from electrowinning rose by 5%, from electrolytic and fire refining (other primary) by 3%, and from secondary refining (from scrap) by 7%. Most of the growth in refined copper production was in China, where total refined copper production increased by an estimated 630,000 t (11%); Congo (Kinshasa), 215,000 t (45%); Peru, 50,000 t (16%); the Philippines, 63,000 t (69%); the United States, 39,000 t (4%); and Zambia, 42,000 t (8%). Significant decreases in refined copper production occurred in Chile, where output declined by 147,000 t (5%); India, 78,000 t (11%); Japan, 48,000 t (3%); Mexico, 48,000 t (8%); and Spain, 56,000 t (14%) (table 22).

World apparent consumption of refined copper, according to ICSG data, rose by about 4% to a record-high 21.4 Mt in 2013. Stocks held on the more visible commodity exchanges (COMEX, LME, SHFE) decreased by about 14% to 507,000 t. ICSG estimates of total reported inventories (exchanges and industry) decreased by 4% to 1.32 Mt (International Copper Study Group, 2015, p. 9, 20–21).

**Brazil.**—The increase in mine production in Brazil was due mainly to the rampup of output at the Salobo Mine [Vale S.A. (Rio de Janeiro)], which increased production to 65,000 t of copper in concentrate from 13,000 t in 2012. An expansion project at Salobo was expected to increase production capacity by an additional 100,000 t/yr of copper in concentrate, beginning in the first half of 2014 (Vale S.A., 2014b, p. 47, 72).

**Canada.**—Copper output in Canada increased by 9% owing mainly to increased production at the Gibraltar Mine [Taseko Mines Ltd. (Vancouver), 75%], the New Afton Mine [New Gold Inc. (Vancouver)], and the Sudbury concentrator [Vale S.A. (Rio de Janeiro)], which was fed by ore from various Vale mines. The Gibraltar Mine increased production to 55,100 t in 2013 from 39,800 t in 2012 owing to the commissioning of a new concentrator in March 2013. Production at the New Afton Mine began in June 2012, and in 2013, its first full year of production, output increased to 32,700 t from 12,900 t in 2012. Output at Vale's Sudbury concentrator increased to 103,000 t in 2013 from 79,000 t in 2012 owing to scheduled maintenance at mines that supplied the Sudbury concentrator in 2012. These increases were partially offset by smaller decreases at various mines (New Gold Inc., 2013, p. 8; 2014, p. 10; Taseko Mines Ltd., 2014, p. 3; Vale S.A., 2014a, p. 9, 11).

**Chile.**—The 6% increase in Chile's mine production was due mainly to an increase in production of 162,000 t to 445,000 t at the Collahuasi Mine [Anglo American plc (London, United Kingdom), 44%; Glencore Xstrata plc (Baar, Switzerland), 44%; others, 12%] and an increase of 118,000 t to 1.19 Mt at the Escondida Mine [BHP Billiton, 57.5%, Rio Tinto plc, 30%; others, 12.5%], the world's leading copper-producing mine. Production at Collahuasi increased owing to higher mill head ore grades and the replacement of a semi-autogenous grinding mill motor in the second quarter of the year. Output at Escondida increased as a result of higher mill head ore grades and improved throughput rates (Anglo American plc, 2014, p. 71, 252; Comisión Chilena del Cobre, 2014; Rio Tinto plc, 2014a, p. 29).

**China.**—The significant increase in refined copper production in China correlated with a reported increase in refining capacity. In 2013, China added 720,000 t/yr of smelting capacity and 1.08 Mt/yr of refining capacity, with total capacity reaching 4.89 Mt/yr and 8.96 Mt/yr, respectively, for smelter and refinery production. Imports of copper ores and concentrates into China increased to 10.1 Mt (2.8 Mt contained copper) in 2013 from 7.8 Mt (2.2 Mt contained copper) in 2012. In 2013, China also imported 4.4 Mt of copper and copper-alloy scrap (4.9 Mt in 2012), 3.2 Mt of refined copper (3.4 Mt in 2012), and 629,000 t of copper blister and anodes (523,000 t in 2012) (Copper Monthly, 2014, p. 4; International Copper Study Group, 2015, p. 24–28, 40).

**Congo (Kinshasa).**—In 2013, mine output of copper increased by an estimated 47% (310,000 t) to 970,000 t in Congo (Kinshasa). The increase was a result of production increases at the Tenke Fungurume Mine and the Mutanda Mine and smaller increases at a number of other mines. The Tenke Fungurume Mine [FCX, 56%; Lundin Mining Corp. (Toronto, Ontario, Canada), 24%; La Generale des Carrieres et des Mines [Lubumbashi, Congo (Kinshasa), 20%] increased copper

cathode production at its SX–EW facility by 33% to 210,000 t of electrowon copper cathode from 158,000 t in 2012 following completion of an expansion project. The Mutanda Mine [Glencore Xstrata plc, 69%; Fleurette Group (Amsterdam, the Netherlands), 31%] increased copper production to 150,600 t from 87,000 t in 2012. The Mutanda Mine reportedly produced electrowon copper, although a small percentage may have been copper contained in concentrate (Glencore Xstrata plc, 2014, p. 7, 14; Lundin Mining Corp., 2014, p. 21).

**Indonesia.**—Mine production in Indonesia increased by 28% owing to increased output at FCX's PT Freeport Indonesia (PT–FI) operations in the Grasberg minerals district. The PT–FI operations increased production by 34% to 421,000 t of recoverable copper owing to higher mill head ore grades and increased milling rates. Newmont Mining Corp.'s Batu Hijau Mine increased production by 3% to 73,000 t in 2013 owing to higher recovery rates. In January 2014, the Government of Indonesia announced that exports of copper concentrate would be banned beginning in January 2017 and that an export tax of 25% would be charged beginning in 2014 that would gradually increase to 60% by mid-2016, and would be in place until the ban takes effect. After January 2017, copper concentrates would need to be processed into metal before being exported. Copper mine production in Indonesia was expected to decline in 2014 owing to the higher tax rate on exports and delays in obtaining export permits caused by the new regulations (Freeport-McMoRan Copper & Gold Inc., 2014a, p. 47–48; 2014b, p. 19–20; Newmont Mining Corp., 2014, p. 76).

**Mongolia.**—In 2013, Mongolia's significant increase in production was due to the startup of the Oyu Tolgoi Mine [Turquoise Hill Resources Ltd. (Vancouver), 66%; Government of Mongolia, 34%]. In January, the Oyu Tolgoi Mine began concentrate production, and by yearend, it had produced 76,700 t of copper in concentrate. The company forecast production of 135,000 to 160,000 t of copper in concentrates in 2014 (Turquoise Hill Resources Ltd., 2014, p. 4, 6, 9).

**Peru.**—In Peru, four mining operations accounted for 72% of the country's production. The Antamina Mine accounted for 32% of Peru's total copper mine production; the Cerro Verde mining complex, 18%; the Cuajone Mine, 12%; and the Antapaccay Mine, 10%. Compania Minera Antamina S.A. (Lima) slightly decreased production of copper in concentrate to about 443,000 t. Production at Sociedad Minera S.A.A.'s (Freeport-McMoRan Copper & Gold Inc., 53.56%) Cerro Verde Mine decreased by 6% to 253,000 t in 2013. Cerro Verde was undergoing expansion to increase production capacity by 270,000 t/yr beginning in 2016. Southern Copper Corp.'s (Grupo Mexico, 82.3%) Cuajone Mine increased output by about 6% to 169,000 t owing to higher mill head ore grades and recovery rates. Production at Glencore Xstrata plc's Antapaccay and Tintaya Mines increased to 139,000 t of copper in concentrate in 2013 from 43,000 t in 2012, owing to the rampup of production at Antapaccay following the mine's November 2012 commissioning. Mining at the Tintaya Mine was thought to have ceased in 2011, although a very small amount of copper may have been produced in 2013 (Freeport-McMoRan Copper & Gold Inc., 2014b, p. 15, 25; Glencore Xstrata plc, 2014, p. 14; Southern Copper Corp., 2014, p. 79).

**Zambia.**—Copper production in Zambia increased mainly owing to the Lumwana Mine [Barrick Gold Corp. (Toronto, Ontario, Canada)], where copper in concentrate output increased to 118,000 t in 2013 from 81,000 t in 2012 owing to higher mill throughput and the processing of higher grade ore at higher recoveries. The Lumwana Mine had begun to implement a new life-of-mine plan in 2012 that reportedly allowed the mine to increase production and lower costs (Barrick Gold Corp., 2014a; 2014b, p. 9, 44).

## Outlook

Based on preliminary estimates for 2014, U.S. mine production is expected to increase by about 7%, mainly owing to increased production at the Morenci Mine following the completion of its mining and milling expansion project and at the Chino and Pinto Valley Mines as they continue to ramp up production. These production increases are expected to be partially offset by decreased production at the Phoenix Mine. Smelter production is expected to increase slightly and refinery production is expected to increase by about 4%. According to data compiled by the ICSG (2015, p. 9, 12), global mine production increased slightly in 2014 as output of copper in concentrate increased slightly and production from SX–EW increased by 3%. World mine capacity increased by 5% and mine capacity utilization decreased to 84.1% from 86.9% in 2013.

In 2014, according to ICSG (2015, p. 9, 14, 17) data, global smelter production increased by 6% and refinery production rose by 7% owing mainly to an increase in primary electrolytic production. Global consumption of refined copper in 2014 was estimated to have increased by about 8%, and despite speculation that there would be a production surplus in 2014, for the fifth consecutive year, global consumption of refined copper was higher (by 475,000 t) than global production of refined copper. This estimate used an apparent consumption calculation for China that did not take into account changes in unreported bonded stocks in China that are held by the State Reserve Bureau, producers, consumers, and traders. When taking into account estimates for these unreported stock changes in China, refined consumption could have been about 500,000 t more than production.

The annual average COMEX copper spot price in 2014 declined by 7% to \$3.12 per pound. The monthly average price in January was \$3.36 per pound and gradually trended down to \$2.90 per pound in December. Copper prices in 2013 were affected mainly by concerns about China's slower economic growth and speculation that the Board of Governors of the Federal Reserve System would begin to raise interest rates. As the world's largest copper consumer, a slowdown in China's economic growth could have a major effect on copper prices, and actions by the U.S. Federal Reserve System that could strengthen the dollar could make physical copper and copper futures, which are valued in U.S. dollars, more expensive for consumers and investors who use currencies other than the U.S. dollar and could reduce copper consumption.

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TABLE 1  
SALIENT COPPER STATISTICS<sup>1</sup>

(Metric tons, unless otherwise specified)

|  | 2009                 | 2010                | 2011                | 2012                | 2013                |           |
|--|----------------------|---------------------|---------------------|---------------------|---------------------|-----------|
| <b>United States:</b>  |                      |                     |                     |                     |                     |           |
| <b>Mine production:</b>  |                      |                     |                     |                     |                     |           |
| Ore concentrated   | thousand metric tons | 149,000             | 160,000             | 187,000             | 180,000             | 172,000   |
| Average yield of concentrated ore                                | percent              | 0.46                | 0.41                | 0.34                | 0.36                | 0.40      |
| <b>Recoverable copper:</b>                                       |                      |                     |                     |                     |                     |           |
| Arizona  |                      | 711,000             | 703,000             | 751,000             | 763,000             | 795,000   |
| Other States   |                      | 470,000             | 406,000             | 362,000             | 404,000             | 453,000   |
| Total  |                      | 1,180,000           | 1,110,000           | 1,110,000           | 1,170,000           | 1,250,000 |
| Total value  | millions             | \$6,290             | \$8,520             | \$9,960             | \$9,450             | \$9,360   |
| <b>Smelter production:</b>                                       |                      |                     |                     |                     |                     |           |
| Primary <sup>2</sup>   |                      | 597,000             | 601,000             | 538,000             | 485,000             | 516,000   |
| Byproduct sulfuric acid, sulfur content                          | thousand metric tons | 671                 | 704                 | 679                 | 545                 | 574       |
| <b>Refinery production:</b>                                      |                      |                     |                     |                     |                     |           |
| <b>Primary materials:</b>  |                      |                     |                     |                     |                     |           |
| Electrolytic from domestic ores                                  |                      | 588,000             | 606,000             | 545,000             | 491,000             | 518,000   |
| Electrolytic from foreign materials                              |                      | 48,300              | 21,000              | --                  | --                  | --        |
| Electrowon   |                      | 476,000             | 430,000             | 447,000             | 471,000             | 475,000   |
| Total  |                      | 1,110,000           | 1,060,000           | 992,000             | 962,000             | 993,000   |
| Secondary materials (scrap), electrolytic and fire refined       |                      | 46,400              | 37,700              | 37,300              | 39,400 <sup>r</sup> | 46,900    |
| Grand total  |                      | 1,160,000           | 1,090,000           | 1,030,000           | 1,000,000           | 1,040,000 |
| <b>Secondary copper produced:</b>                                |                      |                     |                     |                     |                     |           |
| Recovered from new scrap   |                      | 639,000             | 642,000             | 649,000             | 642,000             | 630,000   |
| Recovered from old scrap   |                      | 138,000             | 143,000             | 153,000             | 164,000             | 166,000   |
| Total  |                      | 777,000             | 785,000             | 802,000             | 807,000             | 796,000   |
| Copper sulfate production  |                      | 22,400              | 23,700              | 22,800              | 22,500              | 23,000    |
| Exports, refined   |                      | 80,800              | 78,300              | 40,400              | 159,000             | 113,000   |
| Imports, refined   |                      | 664,000             | 605,000             | 670,000             | 630,000             | 734,000   |
| <b>Stocks, December 31:</b>                                      |                      |                     |                     |                     |                     |           |
| Blister and in-process material                                  |                      | 15,500              | 21,100              | 13,000              | 12,300              | 12,700    |
| <b>Refined copper:</b>   |                      |                     |                     |                     |                     |           |
| Refineries   |                      | 23,700              | 10,300              | 8,360               | 12,900              | 15,000    |
| Wire-rod mills   |                      | 24,700              | 19,700              | 24,000              | 28,100              | 32,600    |
| Brass mills  |                      | 7,610               | 6,400               | 6,850               | 6,540               | 6,710     |
| Other industry   |                      | 4,290               | 4,380               | 4,330               | 4,180               | 4,230     |
| COMEX  |                      | 90,000              | 58,600              | 79,800              | 64,100              | 15,000    |
| London Metal Exchange (LME), U.S. warehouses                     |                      | 283,000             | 284,000             | 286,000             | 120,000             | 185,000   |
| Total  |                      | 434,000             | 384,000             | 409,000             | 236,000             | 258,000   |
| <b>Consumption:</b>  |                      |                     |                     |                     |                     |           |
| Refined copper, reported   |                      | 1,650,000           | 1,760,000           | 1,760,000           | 1,760,000           | 1,830,000 |
| Apparent consumption, primary refined and old scrap <sup>3</sup> |                      | 1,580,000           | 1,760,000           | 1,730,000           | 1,770,000           | 1,780,000 |
| <b>Price:</b>  |                      |                     |                     |                     |                     |           |
| Producer, weighted average                                       | cents per pound      | 241.24              | 348.34              | 405.85              | 367.28              | 339.94    |
| COMEX, first position  | do.                  | 235.42              | 342.51              | 400.05              | 361.45              | 334.11    |
| LME, Grade A cash  | do.                  | 233.56              | 341.74              | 399.79              | 360.58              | 332.29    |
| <b>World, production:</b>  |                      |                     |                     |                     |                     |           |
| Mine   | thousand metric tons | 16,000              | 16,100 <sup>r</sup> | 16,100 <sup>r</sup> | 16,900 <sup>r</sup> | 18,300    |
| Smelter  | do.                  | 14,900              | 15,600              | 15,900              | 16,200 <sup>r</sup> | 17,100    |
| Refinery   | do.                  | 18,400 <sup>r</sup> | 19,100              | 19,700              | 20,200 <sup>r</sup> | 21,000    |

<sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits, except prices; may not add to totals shown.

<sup>2</sup>May contain small amounts of scrap.

<sup>3</sup>In 2009, 2010, 2011, 2012, and 2013, apparent consumption is calculated using general imports of 645,000 metric tons (t), 583,000 t, 649,000 t, 628,000 t, and 729,000 t respectively.

TABLE 2  
LEADING COPPER-PRODUCING MINES IN THE UNITED STATES IN 2013, IN ORDER OF OUTPUT<sup>1</sup>

| Rank | Mine                   | County and State        | Operator                                 | Source of copper                                | Capacity<br>(thousand<br>metric tons) |
|------|------------------------|-------------------------|--|---|---------------------------------------|
| 1    | Morenci                | Greenlee, AZ            | Freeport-McMoRan Copper & Gold Inc.      | Copper-molybdenum ore, concentrated and leached | 420                                   |
| 2    | Bingham Canyon         | Salt Lake, UT           | Kennecott Utah Copper Corp. <sup>2</sup> | Copper-molybdenum ore, concentrated             | 280                                   |
| 3    | Ray                    | Pinal, AZ               | ASARCO LLC <sup>3</sup>                  | Copper ore, concentrated and leached            | 150                                   |
| 4    | Bagdad                 | Yavapai, AZ             | Freeport-McMoRan Copper & Gold Inc.      | Copper-molybdenum ore, concentrated             | 100                                   |
| 5    | Chino                  | Grant, NM               | do.                                      | Copper-molybdenum ore, concentrated and leached | 130                                   |
| 6    | Sierrita               | Pima, AZ                | do.                                      | do.   | 80                                    |
| 7    | Safford                | Graham, AZ              | do.                                      | Copper ore, leached                             | 110                                   |
| 8    | Mission Complex        | Pima, AZ                | ASARCO LLC <sup>3</sup>                  | Copper ore, concentrated                        | 70                                    |
| 9    | Robinson               | White Pine, NV          | KGHM International Ltd.                  | Copper-molybdenum ore, concentrated             | 60                                    |
| 10   | Tyrone                 | Grant, NM               | Freeport-McMoRan Copper & Gold Inc.      | Copper ore, leached                             | 45                                    |
| 11   | Pinto Valley           | Gila, AZ                | Capstone Mining Corp.                    | Copper ore, concentrated and leached            | 60                                    |
| 12   | Phoenix                | Lander, NV              | Newmont Mining Corp.                     | Gold-copper ore, concentrated                   | 40                                    |
| 13   | Continental Pit        | Silver Bow, MT          | Montana Resources                        | Copper-molybdenum ore, concentrated             | 40                                    |
| 14   | Miami                  | Gila, AZ                | Freeport-McMoRan Copper & Gold Inc.      | Copper ore, leached                             | 90                                    |
| 15   | Silver Bell            | Pima, AZ                | ASARCO LLC <sup>3</sup>                  | do.   | 25                                    |
| 16   | Mineral Park           | Mohave, AZ              | Mercator Minerals Ltd.                   | Copper-molybdenum ore, concentrated and leached | 30                                    |
| 17   | Carlota                | Gila, AZ                | KGHM International Ltd.                  | Copper ore, leached                             | 10                                    |
| 18   | Lisbon Valley          | San Juan, UT            | Lisbon Valley Mining Co. LLC             | do.   | 14                                    |
| 19   | Viburnum (#29 and #35) | Washington and Iron, MO | Doe Run Resources Corp.                  | Lead ore  | NA                                    |
| 20   | Brushy Creek           | Reynolds, MO            | do.                                      | do.   | NA                                    |

do. Ditto. NA Not available.

<sup>1</sup>The mines listed accounted for more than 99% of U.S. mine production in 2013.

<sup>2</sup>Wholly owned subsidiary of Rio Tinto plc.

<sup>3</sup>Wholly owned subsidiary of Grupo México, S.A.B. de C.V.

TABLE 3  
MINE PRODUCTION OF COPPER-BEARING ORES AND RECOVERABLE COPPER CONTENT OF ORES  
PRODUCED IN THE UNITED STATES, BY SOURCE AND TREATMENT PROCESS<sup>1</sup>

(Metric tons)

| Source and treatment process   | 2012         |                    | 2013         |                    |
|--|--------------|--------------------|--------------|--------------------|
|  | Gross weight | Recoverable copper | Gross weight | Recoverable copper |
| Mined copper ore:  |              |                    |              |                    |
| Concentrated   | 180,000,000  | 647,000            | 172,000,000  | 692,000            |
| Leached  | NA           | 471,000            | NA           | 475,000            |
| Total  | NA           | 1,120,000          | NA           | 1,170,000          |
| Copper precipitates shipped, leached from tailings, dumps, and in-place material | NA           | W                  | NA           | W                  |
| Other copper-bearing ores <sup>2</sup>   | 5,300,000    | 48,900             | 5,480,000    | 81,200             |
| Grand total  | XX           | 1,170,000          | XX           | 1,250,000          |

NA Not available. W Withheld to avoid disclosing company proprietary data; included with "Other copper-bearing ores." XX Not applicable.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes gold ore, lead ore, and silver ore.

TABLE 4  
CONSUMPTION OF COPPER AND BRASS MATERIALS IN THE UNITED STATES, BY ITEM<sup>1</sup>

(Metric tons)

| Item                        | Brass mills            | Wire-rod mills | Foundries, chemical plants, miscellaneous users | Smelters, refiners, ingot makers | Total                |
|-----------------------------|------------------------|----------------|---|----------------------------------|----------------------|
| 2012:                       |                        |                |   |                                  |                      |
| Copper scrap                | 706,000 <sup>r,2</sup> | W              | 75,800 <sup>r</sup>                             | 157,000                          | 938,000 <sup>r</sup> |
| Refined copper <sup>3</sup> | 424,000                | 1,280,000      | 53,200 <sup>r</sup>                             | 4,510                            | 1,760,000            |
| Hardeners and master alloys | 10,100                 | --             | 4,530 <sup>r</sup>                              | --                               | 14,600               |
| Brass ingots                | --                     | --             | 62,200 <sup>r</sup>                             | --                               | 62,200 <sup>r</sup>  |
| Slab zinc                   | 40,000                 | --             | (4)   | (4)                              | 49,700               |
| 2013:                       |                        |                |   |                                  |                      |
| Copper scrap                | 697,000 <sup>2</sup>   | W              | 64,500  | 140,000                          | 902,000              |
| Refined copper <sup>3</sup> | 457,000                | 1,310,000      | 55,000  | 4,510                            | 1,830,000            |
| Hardeners and master alloys | 10,100                 | --             | 4,810   | --                               | 14,900               |
| Brass ingots                | --                     | --             | 62,100  | --                               | 62,100               |
| Slab zinc                   | 24,000                 | --             | (4)   | (4)                              | 24,900               |

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data; included with "Brass mills." -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes item indicated by symbol W.

<sup>3</sup>Detailed information on consumption of refined copper can be found in table 5.

<sup>4</sup>Withheld to avoid disclosing company proprietary data; included in "Total."



TABLE 5  
CONSUMPTION OF REFINED COPPER SHAPES IN THE UNITED STATES, BY CLASS OF CONSUMER<sup>1</sup>

(Metric tons)

| Class of consumer          | Cathodes           | Ingots and<br>ingot bars | Cakes and<br>slabs | Wirebar, billets,<br>other | Total               |
|----------------------------|--------------------|--------------------------|--------------------|----------------------------|---------------------|
| 2012:                      |                    |                          |                    |                            |                     |
| Wire-rod mills             | 1,280,000          | --                       | --                 | (2)                        | 1,280,000           |
| Brass mills                | 330,000            | W                        | 42,800             | 51,600                     | 424,000             |
| Chemical plants            | W                  | W                        | --                 | 275                        | 275                 |
| Ingot makers               | W                  | W                        | W                  | 4,510                      | 4,510               |
| Foundries                  | 6,370 <sup>r</sup> | 2,320                    | W                  | 9,940 <sup>r</sup>         | 18,600 <sup>r</sup> |
| Miscellaneous <sup>3</sup> | W                  | W                        | W                  | 34,300                     | 34,300              |
| Total                      | 1,610,000          | 2,320                    | 42,800             | 101,000 <sup>r</sup>       | 1,760,000           |
| 2013:                      |                    |                          |                    |                            |                     |
| Wire-rod mills             | 1,310,000          | --                       | --                 | (2)                        | 1,310,000           |
| Brass mills                | 362,000            | W                        | 43,500             | 51,600                     | 457,000             |
| Chemical plants            | W                  | W                        | --                 | 214                        | 214                 |
| Ingot makers               | W                  | W                        | W                  | 4,510                      | 4,510               |
| Foundries                  | 6,350              | 2,090                    | W                  | 10,000                     | 18,500              |
| Miscellaneous <sup>3</sup> | W                  | W                        | W                  | 36,300                     | 36,300              |
| Total                      | 1,680,000          | 2,090                    | 43,500             | 103,000                    | 1,830,000           |

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data; included with "Wirebar, billets, other." -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Withheld to avoid disclosing company proprietary data; included with "Wire-rod mills:" under "Cathodes."

<sup>3</sup>Includes consumers of copper powder and copper shot, iron and steel plants, and other manufacturers.

TABLE 6  
COPPER RECOVERED FROM SCRAP PROCESSED IN THE UNITED STATES,  
BY KIND OF SCRAP AND FORM OF RECOVERY<sup>1</sup>

(Metric tons)

|                         | 2012                | 2013    |
|-------------------------|---------------------|---------|
| Kind of scrap:          |                     |         |
| New:                    |                     |         |
| Copper-base             | 609,000             | 596,000 |
| Aluminum-base           | 32,900              | 33,900  |
| Nickel-base             | 18                  | 18      |
| Total                   | 642,000             | 630,000 |
| Old:                    |                     |         |
| Copper-base             | 134,000             | 136,000 |
| Aluminum-base           | 30,300              | 30,500  |
| Nickel-base             | 267                 | 267     |
| Zinc-base               | 10                  | --      |
| Total                   | 164,000             | 166,000 |
| Grand total             | 807,000             | 796,000 |
| Form of recovery:       |                     |         |
| As unalloyed copper     | 40,500 <sup>r</sup> | 48,100  |
| In brass and bronze     | 698,000             | 678,000 |
| In alloy iron and steel | 658                 | 682     |
| In aluminum alloys      | 62,700 <sup>r</sup> | 64,500  |
| In other alloys         | 10                  | --      |
| In chemical compounds   | 5,030               | 5,030   |
| Total                   | 807,000             | 796,000 |

<sup>r</sup>Revised. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 7  
COPPER RECOVERED AS REFINED COPPER AND IN ALLOYS AND OTHER FORMS  
FROM COPPER-BASE SCRAP PROCESSED IN THE UNITED STATES, BY TYPE OF OPERATION<sup>1</sup>

(Metric tons)

| Type of operation           | From new scrap      |         | From old scrap      |         | Total               |         |
|-----------------------------|---------------------|---------|---------------------|---------|---------------------|---------|
|                             | 2012                | 2013    | 2012                | 2013    | 2012                | 2013    |
| Ingot makers                | 11,800              | 13,600  | 63,700              | 59,600  | 75,500              | 73,100  |
| Refineries <sup>2</sup>     | 17,800              | 17,500  | 21,500 <sup>r</sup> | 29,400  | 39,400 <sup>r</sup> | 46,900  |
| Brass and wire-rod mills    | 544,000             | 531,000 | 28,300              | 35,500  | 572,000             | 567,000 |
| Foundries and manufacturers | 30,800 <sup>r</sup> | 28,800  | 20,100 <sup>r</sup> | 11,100  | 50,800 <sup>r</sup> | 39,900  |
| Chemical plants             | 5,030               | 5,030   | --                  | --      | 5,030               | 5,030   |
| Total                       | 609,000             | 596,000 | 134,000             | 136,000 | 743,000             | 732,000 |

<sup>r</sup>Revised. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes electrolytically refined copper produced from scrap material processed at smelter level.

TABLE 8  
PRODUCTION OF SECONDARY COPPER AND COPPER-ALLOY PRODUCTS  
IN THE UNITED STATES, BY ITEM PRODUCED FROM SCRAP<sup>1</sup>

(Metric tons)

| Item produced from scrap                | 2012                | 2013    |
|---|---------------------|---------|
| Unalloyed copper products:              |                     |         |
| Refined copper                          | 39,400 <sup>r</sup> | 46,900  |
| Copper powder                           | 1,030               | 1,020   |
| Copper castings                         | 126 <sup>r</sup>    | 124     |
| Total                                   | 40,500 <sup>r</sup> | 48,100  |
| Alloyed copper products:                |                     |         |
| Brass and bronze ingots:                |                     |         |
| Tin bronzes                             | 9,070               | 6,230   |
| Leaded red brass and semired brass      | 50,300              | 59,500  |
| High leaded tin bronze                  | 9,650               | 5,100   |
| Yellow brass                            | 5,280               | 4,820   |
| Manganese bronze                        | 7,500               | 6,260   |
| Aluminum bronze                         | 6,320               | 5,170   |
| Nickel silver                           | 1,030               | 1,020   |
| Silicon bronze and brass                | 4,710               | 4,390   |
| Copper-base hardeners and master alloys | 5,250               | 5,250   |
| Miscellaneous                           | 7,800               | 6,090   |
| Total                                   | 107,000             | 104,000 |
| Brass mill and wire-rod mill products   | 700,000             | 687,000 |
| Brass and bronze castings               | 44,300 <sup>r</sup> | 38,500  |
| Copper in chemical products             | 5,030               | 5,030   |
| Grand total                             | 897,000             | 883,000 |

<sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 9  
COMPOSITION OF SECONDARY COPPER-ALLOY PRODUCTION IN THE UNITED STATES<sup>1</sup>

(Metric tons)

|  | Copper              | Tin                | Lead               | Zinc               | Nickel           | Aluminum | Total               |
|--|---------------------|--------------------|--------------------|--------------------|------------------|----------|---------------------|
| <u>Brass and bronze ingot production:<sup>2</sup></u>        |                     |                    |                    |                    |                  |          |                     |
| 2012   | 89,300 <sup>r</sup> | 3,350 <sup>r</sup> | 4,880 <sup>r</sup> | 9,270 <sup>r</sup> | 110 <sup>r</sup> | 13       | 107,000             |
| 2013   | 86,100              | 3,570              | 5,070              | 8,930              | 111              | 11       | 104,000             |
| <u>Secondary metal content of brass mill products:</u>       |                     |                    |                    |                    |                  |          |                     |
| 2012   | 577,000             | 1,310              | 2,330              | 118,000            | 1,050            | 16       | 700,000             |
| 2013   | 567,000             | 1,240              | 2,310              | 116,000            | 1,090            | 16       | 687,000             |
| <u>Secondary metal content of brass and bronze castings:</u> |                     |                    |                    |                    |                  |          |                     |
| 2012   | 41,400 <sup>r</sup> | 1,070              | 539 <sup>r</sup>   | 1,070 <sup>r</sup> | 92               | 98       | 44,300 <sup>r</sup> |
| 2013   | 35,600              | 1,070              | 548                | 1,150              | 77               | 101      | 38,500              |

<sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes approximately 96% from scrap and 4% from other than scrap.



TABLE 10  
CONSUMPTION AND YEAREND STOCKS OF COPPER-BASE SCRAP<sup>1</sup>

(Metric tons, gross weight)

| Scrap type and processor  | 2012                |                    | 2013        |        |
|---|---------------------|--------------------|-------------|--------|
|   | Consumption         | Stocks             | Consumption | Stocks |
| Unalloyed scrap:  |                     |                    |             |        |
| No. 1 wire and heavy:   |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 17,400 <sup>r</sup> | 875                | 18,400      | 860    |
| Brass and wire-rod mills  | 292,000             | (2)                | 288,000     | (2)    |
| Foundries and miscellaneous manufacturers                               | 29,300 <sup>r</sup> | (2)                | 19,900      | (2)    |
| No. 2 mixed heavy and light:  |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 61,900              | 1,950              | 61,500      | 1,830  |
| Brass and wire-rod mills  | 40,400              | (2)                | 44,400      | (2)    |
| Foundries and miscellaneous manufacturers                               | 7,280 <sup>r</sup>  | (2)                | 6,100       | (2)    |
| Total unalloyed scrap:  |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 79,300              | 2,820              | 79,900      | 2,690  |
| Brass and wire-rod mills  | 333,000             | 1,170              | 332,000     | 1,930  |
| Foundries and miscellaneous manufacturers                               | 36,600              | 2,280 <sup>r</sup> | 26,000      | 2,130  |
| Alloyed scrap:  |                     |                    |             |        |
| Red brass: <sup>3</sup>   |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 22,300              | 1,920              | 14,900      | 1,590  |
| Brass mills   | 10,600              | (2)                | 10,700      | (2)    |
| Foundries and miscellaneous manufacturers                               | 2,500 <sup>r</sup>  | (2)                | 2,320       | (2)    |
| Leaded yellow brass:  |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 10,000              | 894                | 8,970       | 816    |
| Brass mills   | 119,000             | (2)                | 118,000     | (2)    |
| Foundries and miscellaneous manufacturers                               | 696                 | (2)                | 642         | (2)    |
| Yellow and low brass, all plants  | 141,000             | 844                | 135,000     | 879    |
| Cartridge cases and brass, all plants                                   | 98,000              | (2)                | 96,400      | (2)    |
| Auto radiators:   |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 20,500              | 782                | 15,600      | 653    |
| Foundries and miscellaneous manufacturers                               | 1,900               | (2)                | 1,900       | (2)    |
| Bronzes:  |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 12,800              | 940                | 9,330       | 613    |
| Brass mills and miscellaneous manufacturers                             | 15,500              | (2)                | 15,300      | (2)    |
| Nickel-copper alloys, all plants  | 9,290               | 184                | 9,540       | 138    |
| Low grade and residues; smelters, refiners, miscellaneous manufacturers | 22,900              | (2)                | 22,900      | (2)    |
| 22,900  | 630                 | 22,900             | 609         |        |
| Other alloy scrap: <sup>4</sup>   |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 1,510               | 687                | 1,010       | 352    |
| Brass mills and miscellaneous manufacturers                             | 5,610               | (2)                | 5,510       | (2)    |
| Total alloyed scrap:  |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 78,000              | 6,790              | 60,200      | 5,400  |
| Brass mills   | 376,000             | 1,040              | 369,000     | 1,340  |
| Foundries and miscellaneous manufacturers                               | 39,100 <sup>r</sup> | 1,980              | 38,500      | 1,960  |
| Total scrap:  |                     |                    |             |        |
| Smelters, refiners, and ingot makers                                    | 157,000             | 9,610              | 140,000     | 8,090  |
| Brass and wire-rod mills  | 709,000             | 2,220              | 701,000     | 3,270  |
| Foundries and miscellaneous manufacturers                               | 75,800              | 4,250              | 64,500      | 4,090  |

<sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Individual breakdown is not available; included in "Total unalloyed scrap," "Total alloyed scrap," and "Total scrap."

<sup>3</sup>Includes cocks and faucets, commercial bronze, composition turnings, gilding metal, railroad car boxes, and silicon bronze.

<sup>4</sup>Includes aluminum bronze, beryllium copper, and refinery brass.

TABLE 11  
CONSUMPTION OF PURCHASED COPPER-BASE SCRAP<sup>1,2</sup>

(Metric tons, gross weight)

| Type of operation                         | New scrap           |         | Old scrap           |         | Total               |         |
|---|---------------------|---------|---------------------|---------|---------------------|---------|
|   | 2012                | 2013    | 2012                | 2013    | 2012                | 2013    |
| Ingot makers                              | 27,700              | 27,700  | 88,900              | 88,900  | 117,000             | 117,000 |
| Smelters and refineries                   | 18,900              | 18,300  | 21,800              | 31,600  | 40,700 <sup>r</sup> | 49,900  |
| Brass and wire-rod mills                  | 680,000             | 664,000 | 29,500              | 36,600  | 709,000             | 701,000 |
| Foundries and miscellaneous manufacturers | 54,400 <sup>r</sup> | 54,000  | 21,400 <sup>r</sup> | 21,600  | 75,800 <sup>r</sup> | 75,600  |
| Total                                     | 781,000             | 764,000 | 162,000             | 179,000 | 942,000             | 943,000 |

<sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Consumption at brass and wire-rod mills assumed equal to receipts.

TABLE 12  
FOUNDRIES AND MISCELLANEOUS MANUFACTURERS CONSUMPTION  
OF BRASS INGOT, REFINED COPPER, AND COPPER SCRAP  
IN THE UNITED STATES<sup>1</sup>

(Metric tons)

| Ingot type or material consumed          | 2012                | 2013   |
|--|---------------------|--------|
| Tin bronzes                              | 6,700 <sup>r</sup>  | 6,650  |
| Leaded red brass and semired brass       | 36,900 <sup>r</sup> | 32,400 |
| Yellow, leaded, low brass <sup>2</sup>   | 8,070 <sup>r</sup>  | 9,870  |
| Manganese bronze                         | 2,800 <sup>r</sup>  | 2,670  |
| Nickel silver <sup>3</sup>               | 1,440 <sup>r</sup>  | 3,580  |
| Aluminum bronze                          | 4,050               | 3,760  |
| Hardeners and master alloys <sup>4</sup> | 4,530 <sup>r</sup>  | 4,810  |
| Lead-free alloys <sup>5</sup>            | 2,260               | 3,160  |
| Total brass ingot                        | 66,700 <sup>r</sup> | 66,900 |
| Refined copper                           | 53,200 <sup>r</sup> | 55,000 |
| Copper scrap                             | 75,800 <sup>r</sup> | 64,500 |

<sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes brass and silicon bronze.

<sup>3</sup>Includes brass, copper nickel, and nickel bronze.

<sup>4</sup>Includes special alloys.

<sup>5</sup>Includes copper-bismuth and copper-bismuth-selenium alloys.

TABLE 13  
AVERAGE PRICES FOR COPPER SCRAP, BY TYPE

(Cents per pound)

| Year | Brass mills<br>No. 1 scrap | Refiners<br>No. 2 scrap | Dealers' buying (New York) |                                   |
|------|----------------------------|-------------------------|----------------------------|-----------------------------------|
|      |                            |                         | No. 2<br>scrap             | Red brass turnings<br>and borings |
| 2012 | 354.19                     | 322.35                  | 289.91                     | 195.35                            |
| 2013 | 330.25                     | 306.25                  | 274.95                     | 188.32                            |

Source: American Metal Market.

TABLE 14  
U.S. EXPORTS OF UNMANUFACTURED COPPER (COPPER CONTENT), BY COUNTRY<sup>1</sup>

| Country            | Ore and concentrate       |                      | Matte, ash, and precipitates |                      | Blister and anodes        |                      | Refined                   |                      | Unalloyed copper scrap    |                          | Total                     |                      |
|--------------------|---------------------------|----------------------|------------------------------|----------------------|---------------------------|----------------------|---------------------------|----------------------|---------------------------|--------------------------|---------------------------|----------------------|
|                    | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons)    | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands)     | Quantity<br>(metric tons) | Value<br>(thousands) |
| 012                | 301,000                   | \$1,920,000          | 35,800                       | \$60,800             | 13,900                    | \$75,500             | 159,000                   | \$1,020,000          | 480,000 <sup>r</sup>      | \$2,470,000 <sup>r</sup> | 989,000                   | \$5,550,000          |
| 013:               |                           |                      |                              |                      |                           |                      |                           |                      |                           |                          |                           |                      |
| Belgium            | --                        | --                   | 539                          | 689                  | 113                       | 259                  | --                        | --                   | 18,400                    | 111,000                  | 19,100                    | 112,000              |
| Canada             | 8,200                     | 57,800               | 28,900                       | 38,000               | 2,990                     | 9,950                | 1,870                     | 11,500               | 20,900                    | 156,000                  | 62,900                    | 273,000              |
| China              | 96,400                    | 575,000              | 574                          | 1,650                | 213                       | 1,480                | 57,100                    | 411,000              | 320,000                   | 1,450,000                | 474,000                   | 2,440,000            |
| Germany            | 4                         | 29                   | 62                           | 163                  | 570                       | 4,300                | 75                        | 268                  | 28,800                    | 174,000                  | 29,600                    | 179,000              |
| Hong Kong          | 1                         | 8                    | --                           | --                   | 1,460                     | 11,900               | 147                       | 589                  | 8,150                     | 26,100                   | 9,760                     | 38,600               |
| India              | --                        | --                   | --                           | --                   | 542                       | 4,580                | (2)                       | 3                    | 873                       | 4,470                    | 1,420                     | 9,060                |
| Japan              | 16,800                    | 99,500               | 962                          | 573                  | 719                       | 5,730                | 3,300                     | 3,850                | 4,080                     | 21,800                   | 25,900                    | 131,000              |
| Korea, Republic of | 3,210                     | 13,300               | --                           | --                   | 1,030                     | 8,350                | --                        | --                   | 10,600                    | 71,700                   | 14,800                    | 93,400               |
| Mexico             | 218,000                   | 1,550,000            | --                           | --                   | 138                       | 1,130                | 49,500                    | 378,000              | 1,780                     | 11,700                   | 269,000                   | 1,940,000            |
| Philippines        | 4,470                     | 29,600               | --                           | --                   | 39                        | 255                  | --                        | --                   | --                        | --                       | 4,510                     | 29,900               |
| Spain              | --                        | --                   | --                           | --                   | 119                       | 862                  | 609                       | 4,890                | 3,550                     | 14,200                   | 4,280                     | 20,000               |
| Other              | 1,190                     | 9,200                | 137                          | 64                   | 3,240                     | 17,800               | 821                       | 4,370                | 32,200                    | 179,000                  | 37,600                    | 211,000              |
| Total              | 348,000                   | 2,330,000            | 31,200                       | 41,200               | 11,200                    | 66,500               | 113,000                   | 815,000              | 449,000                   | 2,220,000                | 953,000                   | 5,480,000            |

Revised. -- Zero.

Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>r</sup> Less than ½ unit.

<sup>1</sup> Source: U.S. Census Bureau.



TABLE 15  
U.S. EXPORTS OF COPPER SEMIMANUFACTURES, BY COUNTRY<sup>1</sup>

| Country              | Pipes and tubing          |                      | Plates, sheets, foil, bars |                      | Bare wire, including wire rod <sup>2</sup> |                      | Wire and cable, stranded  |                      | Copper sulfate            |                      |
|----------------------|---------------------------|----------------------|----------------------------|----------------------|--|----------------------|---------------------------|----------------------|---------------------------|----------------------|
|                      | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons)  | Value<br>(thousands) | Quantity<br>(metric tons)                  | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) |
| 2012                 | 19,600                    | \$194,000            | 28,400                     | \$285,000            | 152,000                                    | \$1,240,000          | 38,700                    | \$408,000            | 6,480                     | \$16,100             |
| 2013:                |                           |                      |                            |                      |  |                      |                           |                      |                           |                      |
| Bahamas, The         | 3                         | 46                   | 38                         | 592                  | 9  | 219                  | 228                       | 2,230                | --                        | --                   |
| Belgium              | --                        | --                   | 45                         | 517                  | 387  | 1,430                | 199                       | 8,430                | 107                       | 177                  |
| Canada               | 4,170                     | 39,300               | 8,490                      | 80,600               | 34,900                                     | 267,000              | 14,000                    | 118,000              | 3,440                     | 8,250                |
| China                | 169                       | 1,480                | 1,720                      | 52,300               | 20,800                                     | 91,600               | 150                       | 3,240                | 611                       | 2,230                |
| Colombia             | 35                        | 201                  | 41                         | 579                  | 31   | 288                  | 117                       | 1,430                | --                        | --                   |
| Costa Rica           | 58                        | 180                  | 22                         | 161                  | 5  | 265                  | 100                       | 1,280                | --                        | --                   |
| Dominican Republic   | 17                        | 159                  | 3                          | 17                   | 72   | 645                  | 90                        | 749                  | 2                         | 12                   |
| Germany              | 7                         | 131                  | 284                        | 4,160                | 12   | 367                  | 66                        | 2,760                | 33                        | 102                  |
| Hong Kong            | 3                         | 106                  | 1,000                      | 11,800               | 265  | 2,260                | 26                        | 697                  | (3)                       | 4                    |
| India                | 10                        | 136                  | 96                         | 1,000                | 59   | 1,120                | 30                        | 601                  | --                        | --                   |
| Israel               | (3)                       | 8                    | 17                         | 377                  | 39   | 278                  | 61                        | 1,850                | 492                       | 1,910                |
| Japan                | 1                         | 32                   | 344                        | 6,570                | 31   | 313                  | 47                        | 1,100                | 143                       | 217                  |
| Korea, Republic of   | 40                        | 663                  | 100                        | 2,040                | 671  | 5,630                | 196                       | 3,690                | 432                       | 1,560                |
| Malaysia             | 18                        | 212                  | 499                        | 8,980                | (3)  | 19                   | 7                         | 188                  | 460                       | 2,040                |
| Mexico               | 6,840                     | 71,500               | 11,900                     | 118,000              | 103,000                                    | 797,000              | 25,800                    | 236,000              | 26                        | 129                  |
| Netherlands          | 40                        | 365                  | 28                         | 210                  | 34   | 425                  | 42                        | 602                  | 28                        | 110                  |
| Saudi Arabia         | 3,680                     | 36,000               | 87                         | 683                  | 1  | 33                   | 240                       | 1,790                | --                        | --                   |
| Singapore            | 7                         | 202                  | 90                         | 1,500                | 400  | 3,520                | 59                        | 1,030                | 167                       | 355                  |
| Taiwan               | 5                         | 100                  | 663                        | 4,690                | 50   | 653                  | 11                        | 269                  | 1,230                     | 4,940                |
| Trinidad and Tobago  | 4                         | 55                   | 5                          | 60                   | 649  | 3,110                | 29                        | 328                  | --                        | --                   |
| United Arab Emirates | 1,100                     | 10,700               | 10                         | 87                   | 39   | 283                  | 24                        | 344                  | --                        | --                   |
| United Kingdom       | 11                        | 192                  | 79                         | 1,520                | 59   | 1,090                | 40                        | 1,250                | 3                         | 12                   |
| Other                | 929                       | 9,260                | 678                        | 8,070                | 636  | 8,290                | 1,590                     | 20,300               | 661                       | 1,390                |
| Total                | 17,100                    | 171,000              | 26,200                     | 305,000              | 162,000                                    | 1,190,000            | 43,100                    | 408,000              | 7,830                     | 23,400               |

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Total exports of wire rod in 2012 were 131,000 (revised) metric tons (t) valued at \$1,100 (revised) million, and in 2013, wire-rod exports were 130,000 t valued at \$998 million.

<sup>3</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 16  
U.S. IMPORTS FOR CONSUMPTION OF UNMANUFACTURED COPPER (COPPER CONTENT), BY COUNTRY<sup>1</sup>

| Country            | Ore and concentrate       |                                   | Matte, ash, and precipitates |                                   | Blister and anode         |                                   | Refined                   |                                   | Unalloyed scrap           |                                   | Total                     |                                   |
|--------------------|---------------------------|-----------------------------------|------------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|                    | Quantity<br>(metric tons) | Value <sup>2</sup><br>(thousands) | Quantity<br>(metric tons)    | Value <sup>2</sup><br>(thousands) | Quantity<br>(metric tons) | Value <sup>2</sup><br>(thousands) | Quantity<br>(metric tons) | Value <sup>2</sup><br>(thousands) | Quantity<br>(metric tons) | Value <sup>2</sup><br>(thousands) | Quantity<br>(metric tons) | Value <sup>2</sup><br>(thousands) |
| 2012               | 6,290                     | \$30,000                          | 1,500                        | \$6,310                           | 554 <sup>1</sup>          | \$8,780                           | 630,000                   | \$5,030,000                       | 30,500                    | \$172,000                         | 669,000                   | \$5,250,000                       |
| 2013:              |                           |                                   |                              |                                   |                           |                                   |                           |                                   |                           |                                   |                           |                                   |
| Brazil             | --                        | --                                | --                           | --                                | --                        | --                                | 4,050                     | 31,900                            | 57                        | 260                               | 4,110                     | 32,200                            |
| Canada             | 58                        | 236                               | 212                          | 1,410                             | 2                         | 52                                | 170,000                   | 1,280,000                         | 14,400                    | 86,500                            | 185,000                   | 1,370,000                         |
| Chile              | --                        | --                                | --                           | --                                | --                        | --                                | 465,000                   | 3,530,000                         | 48                        | 115                               | 465,000                   | 3,530,000                         |
| Congo (Kinshasa)   | --                        | --                                | --                           | --                                | --                        | --                                | 7,250                     | 50,600                            | --                        | --                                | 7,250                     | 50,600                            |
| Costa Rica         | --                        | --                                | --                           | --                                | --                        | --                                | --                        | --                                | 172                       | 734                               | 172                       | 734                               |
| Dominican Republic | --                        | --                                | --                           | --                                | --                        | --                                | --                        | --                                | 631                       | 2,800                             | 631                       | 2,800                             |
| Germany            | --                        | --                                | (3)                          | 5                                 | --                        | --                                | 1,670                     | 13,600                            | 38                        | 65                                | 1,700                     | 13,700                            |
| Japan              | --                        | --                                | 6                            | 36                                | 1                         | 141                               | 5,380                     | 50,100                            | 2                         | 5                                 | 5,390                     | 50,300                            |
| Mexico             | 3,110                     | 17,900                            | 361                          | 908                               | --                        | --                                | 60,900                    | 449,000                           | 9,450                     | 52,400                            | 73,800                    | 521,000                           |
| Nicaragua          | --                        | --                                | --                           | --                                | --                        | --                                | --                        | --                                | 830                       | 4,880                             | 830                       | 4,880                             |
| Peru               | --                        | --                                | --                           | --                                | 511                       | 3,820                             | 11,000                    | 84,400                            | 172                       | 804                               | 11,600                    | 89,000                            |
| Other              | 15                        | 38                                | 486                          | 2,710                             | 351                       | 3,430                             | 7,790                     | 61,900                            | 3,280                     | 15,000                            | 11,900                    | 83,100                            |
| Total              | 3,180                     | 18,200                            | 1,070                        | 5,060                             | 865                       | 7,440                             | 734,000                   | 5,550,000                         | 29,100                    | 163,000                           | 768,000                   | 5,740,000                         |

<sup>1</sup>Revised. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Cost, insurance, freight value at U.S. port.

<sup>3</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 17  
U.S. IMPORTS FOR CONSUMPTION OF COPPER SEMIMANUFACTURES, BY COUNTRY<sup>1</sup>

| Country            | Pipes and tubing          |                                   | Plates, sheets, foil, bars |                                   | Bare wire, including wire rod <sup>2</sup> |                                   | Wire and cable, stranded  |                                   | Copper sulfate            |                                   |
|--------------------|---------------------------|-----------------------------------|----------------------------|-----------------------------------|--|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
|                    | Quantity<br>(metric tons) | Value <sup>3</sup><br>(thousands) | Quantity<br>(metric tons)  | Value <sup>3</sup><br>(thousands) | Quantity<br>(metric tons)                  | Value <sup>3</sup><br>(thousands) | Quantity<br>(metric tons) | Value <sup>3</sup><br>(thousands) | Quantity<br>(metric tons) | Value <sup>3</sup><br>(thousands) |
| 2012               | 666                       | \$8,930                           | 59,100                     | \$592,000                         | 133,000                                    | \$1,100,000                       | 15,900                    | \$141,000                         | 37,600                    | \$94,300                          |
| 2013:              |                           |                                   |                            |                                   |  |                                   |                           |                                   |                           |                                   |
| Brazil             | (4)                       | 13                                | 1,000                      | 10,300                            | --   | --                                | 1                         | 6                                 | --                        | --                                |
| Canada             | 5                         | 241                               | 539                        | 5,830                             | 117,000                                    | 889,000                           | 430                       | 3,640                             | 3,520                     | 7,200                             |
| Chile              | 106                       | 845                               | 1,940                      | 16,000                            | --   | --                                | --                        | --                                | 882                       | 2,000                             |
| China              | 47                        | 406                               | 1,540                      | 16,500                            | 490  | 5,980                             | 93                        | 1,000                             | 220                       | 530                               |
| Finland            | 3                         | 49                                | 3,910                      | 39,500                            | 733  | 7,230                             | --                        | --                                | --                        | --                                |
| France             | 2                         | 293                               | 1,370                      | 12,400                            | --   | --                                | 5                         | 222                               | 3                         | 31                                |
| Germany            | 1                         | 73                                | 20,300                     | 195,000                           | 388  | 3,580                             | 28                        | 823                               | 67                        | 79                                |
| Hong Kong          | --                        | --                                | 240                        | 2,150                             | 4  | 52                                | --                        | --                                | --                        | --                                |
| India              | 73                        | 1,080                             | 408                        | 4,180                             | --   | --                                | 70                        | 1,860                             | 22                        | 67                                |
| Israel             | --                        | --                                | 6                          | 83                                | 310  | 3,370                             | (4)                       | 3                                 | --                        | --                                |
| Italy              | 2                         | 68                                | 13                         | 209                               | --   | --                                | 33                        | 722                               | --                        | --                                |
| Japan              | 18                        | 206                               | 2,040                      | 77,400                            | 97   | 1,400                             | 2                         | 80                                | 555                       | 565                               |
| Korea, Republic of | 118                       | 1,100                             | 1,070                      | 13,300                            | 119  | 1,300                             | 2                         | 27                                | 48                        | 386                               |
| Luxembourg         | --                        | --                                | 1,370                      | 17,300                            | --   | --                                | --                        | --                                | --                        | --                                |
| Mexico             | 62                        | 861                               | 5,010                      | 42,800                            | 12,300                                     | 91,500                            | 272                       | 2,090                             | 25,800                    | 61,800                            |
| Peru               | --                        | --                                | 9,000                      | 76,200                            | 230  | 1,880                             | --                        | --                                | 183                       | 444                               |
| Russia             | --                        | --                                | --                         | --                                | 5,120                                      | 40,500                            | --                        | --                                | 3,150                     | 9,130                             |
| Sweden             | --                        | --                                | 534                        | 5,430                             | 1  | 8                                 | (4)                       | 2                                 | --                        | --                                |
| Taiwan             | --                        | --                                | 348                        | 2,760                             | (4)  | 3                                 | 8                         | 440                               | 1,710                     | 5,250                             |
| Thailand           | --                        | --                                | 191                        | 1,850                             | --   | --                                | 116                       | 1,160                             | --                        | --                                |
| Turkey             | --                        | --                                | --                         | --                                | --   | --                                | 14,100                    | 117,000                           | --                        | --                                |
| United Kingdom     | 1                         | 39                                | 258                        | 3,560                             | 2  | 145                               | 2                         | 74                                | --                        | --                                |
| Other              | 17                        | 144                               | 2,230                      | 18,500                            | 84   | 800                               | 179                       | 2,390                             | 2                         | 15                                |
| Total              | 455                       | 5,410                             | 53,200                     | 562,000                           | 137,000                                    | 1,050,000                         | 15,300                    | 132,000                           | 36,100                    | 87,600                            |

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Total imports of wire rod in 2012 were 129,000 (revised) metric tons (t) valued at \$1,050 (revised) million, and in 2013, wire-rod imports were 137,000 t valued at \$1,040 million.

<sup>3</sup>Cost, insurance, freight value at U.S. port.

<sup>4</sup>Less than ½ unit.

Source: U.S. Census Bureau.



TABLE 18  
U.S. EXPORTS OF COPPER SCRAP, BY COUNTRY<sup>1</sup>

| Country            | Unalloyed copper scrap    |                      |                           |                      | Copper-alloy scrap        |                      |                           |                      |
|--------------------|---------------------------|----------------------|---------------------------|----------------------|---------------------------|----------------------|---------------------------|----------------------|
|                    | 2012                      |                      | 2013                      |                      | 2012                      |                      | 2013                      |                      |
|                    | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) |
| Belgium            | 23,900                    | \$152,000            | 18,400                    | \$111,000            | 15,700                    | \$48,100             | 10,900                    | \$37,300             |
| Canada             | 20,000                    | 159,000              | 20,900                    | 156,000              | 41,400                    | 140,000              | 36,500                    | 140,000              |
| China              | 341,000                   | 1,600,000            | 320,000                   | 1,450,000            | 539,000                   | 1,350,000            | 523,000                   | 1,310,000            |
| Germany            | 22,200                    | 126,000              | 28,800                    | 174,000              | 13,400                    | 67,200               | 8,440                     | 30,000               |
| Hong Kong          | 4,820                     | 19,700               | 8,160                     | 26,100               | 43,900                    | 104,000              | 48,800                    | 111,000              |
| India              | 1,260                     | 7,230                | 873                       | 4,470                | 8,880                     | 33,300               | 8,280                     | 22,300               |
| Japan              | 9,470                     | 60,300               | 4,080                     | 21,800               | 8,760                     | 40,600               | 14,000                    | 58,000               |
| Korea, Republic of | 16,400                    | 117,000              | 10,600                    | 71,700               | 9,750                     | 39,400               | 12,000                    | 45,600               |
| Mexico             | 3,960                     | 15,500               | 1,780                     | 11,700               | 5,340                     | 30,900               | 3,580                     | 20,000               |
| Spain              | 4,270                     | 28,900               | 3,550                     | 14,200               | 8,070                     | 27,600               | 8,720                     | 26,500               |
| Taiwan             | 2,990                     | 18,600               | 4,740                     | 26,900               | 3,200                     | 7,390                | 7,680                     | 11,700               |
| Other              | 29,400                    | 172,000              | 27,400                    | 153,000              | 18,200                    | 41,600 <sup>r</sup>  | 24,100                    | 40,800               |
| Total              | 479,000                   | 2,480,000            | 450,000                   | 2,220,000            | 716,000                   | 1,930,000            | 706,000                   | 1,850,000            |

<sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 19  
U.S. IMPORTS FOR CONSUMPTION OF COPPER SCRAP, BY COUNTRY<sup>1</sup>

| Country or territory | Unalloyed copper scrap    |                                   | Copper-alloy scrap            |  |                                   |
|----------------------|---------------------------|-----------------------------------|-------------------------------|--|-----------------------------------|
|                      | Quantity<br>(metric tons) | Value <sup>2</sup><br>(thousands) | Gross weight<br>(metric tons) | Copper content <sup>3</sup><br>(metric tons) | Value <sup>2</sup><br>(thousands) |
| 2012                 | 30,500                    | \$172,000                         | 74,100                        | 53,300                                       | \$362,000                         |
| 2013:                |                           |                                   |                               |  |                                   |
| Bahamas, The         | 377                       | 1,620                             | 558                           | 402  | 1,690                             |
| Brazil               | 57                        | 260                               | 181                           | 131  | 1,080                             |
| Canada               | 14,400                    | 86,500                            | 34,200                        | 24,600                                       | 181,000                           |
| China                | 33                        | 65                                | 477                           | 344  | 2,820                             |
| Colombia             | 157                       | 720                               | 358                           | 258  | 2,620                             |
| Costa Rica           | 172                       | 734                               | 2,140                         | 1,540  | 11,500                            |
| Dominican Republic   | 631                       | 2,800                             | 1,040                         | 748  | 2,720                             |
| Ecuador              | 40                        | 185                               | 629                           | 453  | 2,170                             |
| El Salvador          | 603                       | 2,650                             | 577                           | 415  | 2,050                             |
| Guatemala            | 598                       | 2,820                             | 2,260                         | 1,620  | 12,200                            |
| Honduras             | 12                        | 55                                | 1,140                         | 823  | 4,400                             |
| Mexico               | 9,450                     | 52,400                            | 29,900                        | 21,500                                       | 119,000                           |
| Nicaragua            | 830                       | 4,880                             | 391                           | 281  | 1,580                             |
| Panama               | 94                        | 585                               | 601                           | 433  | 3,090                             |
| Philippines          | --                        | --                                | 321                           | 231  | 2,110                             |
| Saudi Arabia         | 37                        | 163                               | 243                           | 175  | 2,000                             |
| Suriname             | 341                       | 2,260                             | 42                            | 30   | 222                               |
| Trinidad and Tobago  | 17                        | 86                                | 210                           | 151  | 1,280                             |
| United Arab Emirates | --                        | --                                | 191                           | 137  | 1,600                             |
| Other                | 1,230                     | 4,760                             | 1,820                         | 1,310  | 7,740                             |
| Total                | 29,100                    | 163,000                           | 77,300                        | 55,600                                       | 362,000                           |

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Cost, insurance, freight value at U.S. port.

<sup>3</sup>Content is estimated by the U.S. Geological Survey to be 72% of gross weight.

Source: U.S. Census Bureau.

TABLE 20  
COPPER: WORLD MINE PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Metric tons)

| Country                                  | 2009                 | 2010                 | 2011                 | 2012                   | 2013                |
|--|----------------------|----------------------|----------------------|------------------------|---------------------|
| Albania                                  | 2,596 <sup>r</sup>   | 2,672 <sup>r</sup>   | 4,378 <sup>r</sup>   | 4,800 <sup>r</sup>     | 5,300 <sup>e</sup>  |
| Argentina                                | 143,084              | 140,001              | 116,698              | 136,000                | 109,700             |
| Armenia                                  | 23,233               | 31,062               | 33,597               | 41,220 <sup>r</sup>    | 42,000 <sup>e</sup> |
| Australia: <sup>e</sup>                  |                      |                      |                      |                        |                     |
| Concentrates                             | 831,000              | 856,000              | 922,300              | 914,000                | 945,000             |
| Leaching, electrowon                     | 23,000               | 14,400               | 35,600               | 44,000                 | 45,000              |
| Total                                    | 854,000              | 870,000              | 958,000              | 958,000                | 990,000             |
| Azerbaijan                               | --                   | 184                  | 611 <sup>r</sup>     | 502 <sup>r</sup>       | 600 <sup>e</sup>    |
| Bolivia:                                 |                      |                      |                      |                        |                     |
| Concentrates                             | -- <sup>r</sup>      | -- <sup>r</sup>      | 1,900 <sup>r</sup>   | 5,400 <sup>r</sup>     | 5,500 <sup>e</sup>  |
| Leaching, electrowon                     | 200 <sup>r</sup>     | 880 <sup>r</sup>     | 1,000 <sup>r</sup>   | 900 <sup>r</sup>       | 1,000 <sup>e</sup>  |
| Total                                    | 200 <sup>r</sup>     | 880 <sup>r</sup>     | 2,900 <sup>r</sup>   | 6,300 <sup>r</sup>     | 6,500 <sup>e</sup>  |
| Botswana                                 | 28,595               | 20,833               | 31,929               | 35,708                 | 62,300              |
| Brazil:                                  |                      |                      |                      |                        |                     |
| Concentrates                             | 211,692              | 213,548              | 213,760 <sup>r</sup> | 223,141 <sup>r</sup>   | 271,000             |
| Leaching, electrowon                     | 6,500                | 4,497 <sup>r</sup>   | 4,550 <sup>r</sup>   | 4,374 <sup>r</sup>     | 4,000               |
| Total                                    | 218,192              | 218,045 <sup>r</sup> | 218,310 <sup>r</sup> | 227,515 <sup>r</sup>   | 275,000             |
| Bulgaria <sup>e</sup>                    | 105,000              | 105,000              | 105,000              | 107,900                | 110,000             |
| Burma, leaching, electrowon <sup>e</sup> | 3,500                | 9,000 <sup>r</sup>   | 9,000 <sup>r</sup>   | 19,000 <sup>r</sup>    | 20,000              |
| Canada:                                  |                      |                      |                      |                        |                     |
| Concentrates                             | 484,600 <sup>r</sup> | 522,200 <sup>r</sup> | 568,800 <sup>r</sup> | 578,600 <sup>r</sup>   | 631,900             |
| Leaching, electrowon                     | 1,000 <sup>r</sup>   | 800 <sup>r</sup>     | 1,000                | 900                    | --                  |
| Total                                    | 485,600 <sup>r</sup> | 523,000 <sup>r</sup> | 569,800 <sup>r</sup> | 579,500 <sup>r</sup>   | 631,900             |
| Chile: <sup>3</sup>                      |                      |                      |                      |                        |                     |
| Concentrates                             | 3,276,900            | 3,330,400            | 3,238,000            | 3,405,100              | 3,843,100           |
| Leaching, electrowon                     | 2,117,500            | 2,088,500            | 2,024,800            | 2,028,800              | 1,932,900           |
| Total                                    | 5,394,400            | 5,418,900            | 5,262,800            | 5,433,900              | 5,776,000           |
| China: <sup>e</sup>                      |                      |                      |                      |                        |                     |
| Concentrates                             | 1,040,000            | 1,160,000            | 1,270,000            | 1,550,000 <sup>r</sup> | 1,560,000           |
| Leaching, electrowon                     | 25,000               | 35,000               | 35,000               | 30,000                 | 40,000              |
| Total                                    | 1,070,000            | 1,200,000            | 1,310,000            | 1,580,000 <sup>r</sup> | 1,600,000           |
| Colombia                                 | 1,251                | 861                  | 890                  | 750 <sup>r</sup>       | 640                 |
| Congo (Kinshasa): <sup>4</sup>           |                      |                      |                      |                        |                     |
| Concentrates <sup>e</sup>                | 163,000 <sup>r</sup> | 159,000 <sup>r</sup> | 198,000 <sup>r</sup> | 185,000 <sup>r</sup>   | 280,000             |
| Leaching, electrowon                     | 167,000              | 261,000 <sup>r</sup> | 332,000 <sup>r</sup> | 475,000 <sup>r</sup>   | 690,000             |
| Total <sup>e</sup>                       | 330,000 <sup>r</sup> | 420,000 <sup>r</sup> | 530,000 <sup>r</sup> | 660,000 <sup>r</sup>   | 970,000             |
| Cyprus, leaching, electrowon             | 2,380                | 2,595                | 3,660                | 4,328                  | 3,631               |
| Dominican Republic                       | 12,937               | 10,015               | 11,777               | 11,737                 | 10,379              |
| Finland                                  | 14,600               | 14,700               | 14,000 <sup>r</sup>  | 25,500 <sup>r</sup>    | 38,800              |
| Georgia <sup>e</sup>                     | 9,800 <sup>s</sup>   | 6,700 <sup>s</sup>   | 6,300                | 7,400 <sup>r</sup>     | 5,000               |
| India                                    | 29,500               | 35,500               | 37,700               | 34,000                 | 36,100              |
| Indonesia: <sup>e</sup>                  |                      |                      |                      |                        |                     |
| Concentrates                             | 997,403 <sup>s</sup> | 876,984 <sup>s</sup> | 534,000 <sup>r</sup> | 394,000 <sup>r</sup>   | 504,000             |
| Leaching, electrowon                     | 1,127 <sup>s</sup>   | 1,392 <sup>s</sup>   | 900                  | --                     | --                  |
| Total                                    | 998,530 <sup>s</sup> | 878,376 <sup>s</sup> | 535,000 <sup>r</sup> | 394,000 <sup>r</sup>   | 504,000             |
| Iran: <sup>e</sup>                       |                      |                      |                      |                        |                     |
| Concentrates                             | 256,000              | 249,000              | 249,000              | 233,000                | 209,000             |
| Leaching, electrowon                     | 7,000                | 7,000                | 10,100               | 12,000                 | 14,000              |
| Total                                    | 263,000              | 256,000              | 259,000              | 245,000                | 223,000             |
| Kazakhstan:                              |                      |                      |                      |                        |                     |
| Concentrates                             | 445,000 <sup>r</sup> | 427,000              | 405,300 <sup>r</sup> | 419,200 <sup>r</sup>   | 440,000             |
| Leaching, electrowon                     | --                   | --                   | --                   | 7,000 <sup>r,e</sup>   | 12,200              |
| Total                                    | 445,000 <sup>r</sup> | 427,000              | 405,300 <sup>r</sup> | 426,000 <sup>r,e</sup> | 452,200             |
| Korea, North                             | 12,000               | 12,000               | 12,000               | 16,000 <sup>r</sup>    | 17,000              |
| Korea, Republic of                       | -- <sup>r</sup>      | -- <sup>r</sup>      | -- <sup>r</sup>      | -- <sup>r</sup>        | --                  |

See footnotes at end of table.

TABLE 20—Continued  
COPPER: WORLD MINE PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Metric tons)

| Country                               | 2009                 | 2010                 | 2011                 | 2012                   | 2013                |
|---------------------------------------|----------------------|----------------------|----------------------|------------------------|---------------------|
| <b>Laos:</b>                          |                      |                      |                      |                        |                     |
| Concentrates                          | 54,019               | 67,806               | 59,897               | 63,285 <sup>r</sup>    | 65,000              |
| Leaching, electrowon                  | 67,561               | 64,241               | 78,859               | 86,295 <sup>r</sup>    | 90,000              |
| Total                                 | 121,580              | 132,047              | 138,756              | 149,580 <sup>r</sup>   | 155,000             |
| <b>Macedonia:<sup>e</sup></b>         |                      |                      |                      |                        |                     |
| Concentrates                          | 7,600                | 7,900                | 7,600                | 8,900 <sup>r</sup>     | 9,200               |
| Leaching, electrowon                  | --                   | --                   | --                   | 1,100                  | 1,900               |
| Total                                 | 7,600                | 7,900                | 7,600                | 10,000 <sup>r</sup>    | 11,100              |
| Mauritania                            | 36,608 <sup>r</sup>  | 36,969 <sup>r</sup>  | 35,281               | 37,670                 | 37,970              |
| <b>Mexico:</b>                        |                      |                      |                      |                        |                     |
| Concentrates                          | 173,000              | 170,100              | 295,000              | 343,000                | 317,000             |
| Leaching, electrowon <sup>c</sup>     | 68,000               | 100,000              | 149,000              | 157,000                | 163,000             |
| Total <sup>c</sup>                    | 241,000              | 270,000              | 444,000              | 500,000                | 480,000             |
| <b>Mongolia:</b>                      |                      |                      |                      |                        |                     |
| Concentrates                          | 127,000 <sup>r</sup> | 125,000 <sup>r</sup> | 121,600 <sup>r</sup> | 121,700 <sup>r</sup>   | 186,700             |
| Leaching, electrowon                  | 2,500 <sup>r</sup>   | 2,700 <sup>r</sup>   | 2,400 <sup>r</sup>   | 2,100 <sup>r</sup>     | 2,100               |
| Total                                 | 129,500 <sup>r</sup> | 127,700 <sup>r</sup> | 124,000 <sup>r</sup> | 123,800 <sup>r</sup>   | 188,800             |
| Morocco                               | 12,600 <sup>r</sup>  | 16,000 <sup>r</sup>  | 12,900 <sup>r</sup>  | 17,700 <sup>r</sup>    | 18,000 <sup>c</sup> |
| Namibia                               | --                   | --                   | 3,336 <sup>r</sup>   | 5,304 <sup>r</sup>     | 5,182               |
| Oman <sup>e</sup>                     | 2,000                | 2,000                | 2,000                | 2,000                  | 2,000               |
| Pakistan <sup>c</sup>                 | 18,500 <sup>s</sup>  | 18,000 <sup>s</sup>  | 19,000               | 19,000                 | 20,000              |
| Papua New Guinea                      | 166,700              | 159,800              | 130,470 <sup>r</sup> | 125,350 <sup>r</sup>   | 119,300             |
| <b>Peru:</b>                          |                      |                      |                      |                        |                     |
| Concentrates                          | 1,113,454            | 1,094,123            | 1,094,971            | 1,197,569 <sup>r</sup> | 1,285,983           |
| Leaching, electrowon                  | 162,795              | 153,022              | 140,341              | 101,174 <sup>r</sup>   | 89,658              |
| Total                                 | 1,276,249            | 1,247,145            | 1,235,312            | 1,298,743 <sup>r</sup> | 1,375,641           |
| Philippines                           | 49,060               | 58,412               | 63,835               | 65,444                 | 90,861              |
| Poland                                | 439,000              | 425,400              | 426,700              | 427,064 <sup>r</sup>   | 429,273             |
| Portugal                              | 86,500               | 74,426               | 79,686               | 74,043 <sup>r</sup>    | 77,236              |
| Romania <sup>6</sup>                  | 1,000                | 5,000                | 6,500                | 6,300 <sup>r</sup>     | 6,800               |
| <b>Russia:<sup>c</sup></b>            |                      |                      |                      |                        |                     |
| Concentrates                          | 662,400 <sup>r</sup> | 699,500 <sup>r</sup> | 710,400 <sup>r</sup> | 718,000 <sup>r</sup>   | 800,000             |
| Leaching, electrowon                  | 3,300 <sup>r</sup>   | 3,200 <sup>r</sup>   | 2,700 <sup>r</sup>   | 2,000 <sup>r</sup>     | 2,000               |
| Total                                 | 665,700 <sup>r</sup> | 702,700 <sup>r</sup> | 713,100 <sup>r</sup> | 720,000 <sup>r</sup>   | 802,000             |
| Saudi Arabia                          | 1,719                | 1,603                | 1,620                | 6,000 <sup>r</sup>     | 9,950 <sup>c</sup>  |
| Serbia                                | 23,400               | 24,600               | 28,000               | 34,400                 | 36,500              |
| South Africa                          | 107,600              | 102,600              | 96,600               | 81,000 <sup>r</sup>    | 74,000              |
| <b>Spain:</b>                         |                      |                      |                      |                        |                     |
| Concentrates                          | 16,400 <sup>r</sup>  | 22,300 <sup>r</sup>  | 33,000 <sup>r</sup>  | 32,200 <sup>r</sup>    | 26,100              |
| Leaching, electrowon                  | 5,600                | 28,500               | 42,100               | 67,700 <sup>r</sup>    | 69,300              |
| Total                                 | 22,000 <sup>r</sup>  | 50,800 <sup>r</sup>  | 75,100 <sup>r</sup>  | 99,900 <sup>r</sup>    | 95,400              |
| Sweden                                | 55,400 <sup>r</sup>  | 76,500               | 83,000               | 82,422 <sup>r</sup>    | 82,904              |
| Tanzania, in concentrates and bullion | 3,079                | 6,392                | 6,748                | 5,840 <sup>r</sup>     | 5,752               |
| Turkey <sup>c,6</sup>                 | 84,000 <sup>r</sup>  | 88,000 <sup>r</sup>  | 80,000               | 104,000 <sup>r</sup>   | 120,000             |
| <b>United States:<sup>5</sup></b>     |                      |                      |                      |                        |                     |
| Concentrates                          | 705,000              | 679,000              | 666,000              | 696,000 <sup>r</sup>   | 774,000             |
| Leaching, electrowon                  | 476,000              | 430,000              | 447,000              | 471,000 <sup>r</sup>   | 475,000             |
| Total                                 | 1,180,000            | 1,110,000            | 1,110,000            | 1,170,000              | 1,250,000           |
| Uzbekistan <sup>c</sup>               | 95,000               | 90,000               | 91,500 <sup>s</sup>  | 95,600                 | 97,000              |
| Vietnam <sup>c</sup>                  | 11,300 <sup>s</sup>  | 11,300               | 11,300 <sup>r</sup>  | 11,300 <sup>r</sup>    | 12,000              |
| <b>Zambia:<sup>c</sup></b>            |                      |                      |                      |                        |                     |
| Concentrates                          | 557,000              | 540,000              | 524,000              | 515,000                | 559,000             |
| Leaching, electrowon                  | 141,000              | 146,000              | 144,000              | 175,000                | 201,000             |
| Total                                 | 698,000              | 686,000              | 668,000              | 690,000                | 760,000             |

See footnotes at end of table.

TABLE 20—Continued  
 COPPER: WORLD MINE PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Metric tons)

| Country                             | 2009                    | 2010                    | 2011                    | 2012                    | 2013       |
|-------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------|
| Zimbabwe, concentrates <sup>c</sup> | 3,572 <sup>5</sup>      | 4,700                   | 6,000                   | 6,300                   | 6,700      |
| Grand total                         | 16,000,000              | 16,100,000 <sup>f</sup> | 16,100,000 <sup>f</sup> | 16,900,000 <sup>f</sup> | 18,300,000 |
| Of which:                           |                         |                         |                         |                         |            |
| Concentrates                        | 12,700,000 <sup>f</sup> | 12,800,000              | 12,700,000 <sup>f</sup> | 13,200,000 <sup>f</sup> | 14,400,000 |
| Leaching, electrowon                | 3,280,000 <sup>f</sup>  | 3,350,000 <sup>f</sup>  | 3,460,000 <sup>f</sup>  | 3,690,000 <sup>f</sup>  | 3,860,000  |

<sup>e</sup>Estimated. <sup>f</sup>Revised. -- Zero.

<sup>1</sup>Grand totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Represents copper content by analysis of concentrates produced (includes cement copper, if applicable), except where otherwise noted. Includes data available through July 29, 2015.

<sup>3</sup>Reported by Comisión Chilena del Cobre. Includes recoverable copper content of nonduplicative mine and metal products produced from domestic ores and concentrates and leach production for electrowinning.

<sup>4</sup>Recoverable content.

<sup>5</sup>Reported figure.

<sup>6</sup>Does not include copper content of pyrite.

TABLE 21  
COPPER: WORLD SMELTER PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Metric tons, gross weight)

| Country <sup>3</sup>                        | 2009                 | 2010                 | 2011                 | 2012                   | 2013                 |
|---|----------------------|----------------------|----------------------|------------------------|----------------------|
| Armenia, primary                            | 6,858                | 7,644                | 8,876                | 10,075 <sup>r</sup>    | 10,771               |
| Australia, primary                          | 422,000              | 410,000              | 442,000 <sup>r</sup> | 422,000 <sup>r</sup>   | 446,000              |
| Austria, secondary                          | 90,800               | 92,200               | 92,200               | 95,000 <sup>e</sup>    | 95,000 <sup>e</sup>  |
| Belgium, secondary                          | 114,400              | 118,600              | 112,900              | 118,600 <sup>r</sup>   | 150,600              |
| Botswana, primary <sup>4</sup>              | 24,382               | 22,750               | 16,100               | 17,625                 | 18,000 <sup>e</sup>  |
| <b>Brazil:</b>                              |                      |                      |                      |                        |                      |
| Primary                                     | 193,900 <sup>r</sup> | 222,300 <sup>r</sup> | 222,550 <sup>r</sup> | 186,000 <sup>r</sup>   | 200,000 <sup>e</sup> |
| Secondary <sup>e</sup>                      | 31,000               | 23,000 <sup>r</sup>  | 22,800 <sup>r</sup>  | 24,700 <sup>r</sup>    | 26,000               |
| Total <sup>e</sup>                          | 225,000              | 245,000 <sup>r</sup> | 245,000 <sup>r</sup> | 211,000 <sup>r</sup>   | 226,000              |
| <b>Bulgaria:</b>                            |                      |                      |                      |                        |                      |
| Primary                                     | 254,700              | 229,900              | 256,300              | 264,200                | 283,000              |
| Secondary <sup>e</sup>                      | 46,100               | 38,800               | 82,000               | 46,300                 | 47,000               |
| Total <sup>e</sup>                          | 301,000              | 269,000              | 338,000              | 311,000                | 330,000              |
| <b>Canada:</b>                              |                      |                      |                      |                        |                      |
| Primary                                     | 316,510              | 318,006              | 304,724              | 287,051                | 254,000              |
| Secondary                                   | 29,733               | 31,815               | 25,214               | 23,362                 | 29,000               |
| Total                                       | 346,243              | 349,821              | 329,938              | 310,413                | 283,000              |
| Chile, primary                              | 1,522,300            | 1,559,800            | 1,522,300            | 1,342,400              | 1,358,300            |
| <b>China:<sup>e</sup></b>                   |                      |                      |                      |                        |                      |
| Primary                                     | 2,700,000            | 2,800,000            | 3,030,000            | 3,200,000              | 4,000,000            |
| Secondary                                   | 1,100,000            | 1,300,000            | 1,600,000            | 1,800,000              | 2,000,000            |
| Total                                       | 3,800,000            | 4,100,000            | 4,630,000            | 5,000,000              | 6,000,000            |
| <b>Finland:<sup>e</sup></b>                 |                      |                      |                      |                        |                      |
| Primary                                     | 138,000              | 149,000              | 156,000              | 175,000 <sup>r</sup>   | 175,000              |
| Secondary                                   | 2,000                | 2,000                | 2,000                | 2,000                  | 2,000                |
| Total                                       | 140,000              | 151,000              | 158,000              | 177,000 <sup>r</sup>   | 177,000              |
| <b>Germany:</b>                             |                      |                      |                      |                        |                      |
| Primary                                     | 286,300              | 378,700              | 335,000 <sup>r</sup> | 352,400 <sup>r</sup>   | 295,200              |
| Secondary                                   | 247,500              | 206,000 <sup>r</sup> | 212,000 <sup>r</sup> | 182,000 <sup>r</sup>   | 168,600              |
| Total                                       | 533,800              | 584,700 <sup>r</sup> | 547,000 <sup>r</sup> | 534,400 <sup>r</sup>   | 463,800              |
| <b>India:</b>                               |                      |                      |                      |                        |                      |
| Primary                                     | 705,100              | 748,800              | 670,000              | 680,000                | 690,000              |
| Secondary <sup>e</sup>                      | 10,000               | 9,000                | 7,000                | 5,000                  | 6,000                |
| Total <sup>e</sup>                          | 715,000              | 758,000              | 677,000              | 685,000                | 696,000              |
| Indonesia, primary                          | 310,200 <sup>r</sup> | 262,700 <sup>r</sup> | 276,200              | 198,400 <sup>r</sup>   | 217,700              |
| <b>Iran:<sup>e</sup></b>                    |                      |                      |                      |                        |                      |
| Primary                                     | 193,000              | 190,000              | 185,000              | 180,000                | 155,000              |
| Secondary                                   | 69,000               | 91,000               | 85,000               | 90,000                 | 70,000               |
| Total                                       | 262,000              | 281,000              | 270,000              | 270,000                | 225,000              |
| <b>Japan:</b>                               |                      |                      |                      |                        |                      |
| Primary                                     | 1,297,943            | 1,382,700            | 1,168,284            | 1,304,900 <sup>r</sup> | 1,249,300            |
| Secondary                                   | 243,859              | 260,200              | 269,748              | 303,900 <sup>r</sup>   | 313,600              |
| Total                                       | 1,541,802            | 1,642,900            | 1,438,032            | 1,608,800 <sup>r</sup> | 1,562,900            |
| Kazakhstan, undifferentiated                | 332,854              | 318,637              | 302,975              | 302,576 <sup>r</sup>   | 269,687              |
| Korea, North, undifferentiated <sup>e</sup> | 10,000               | 10,000               | 10,000               | 10,000                 | 10,000               |
| <b>Korea, Republic of:</b>                  |                      |                      |                      |                        |                      |
| Primary                                     | 455,400              | 457,900              | 449,200              | 477,300                | 478,800              |
| Secondary <sup>e</sup>                      | 43,800               | 65,200               | 89,800               | 144,500 <sup>5</sup>   | 125,100 <sup>5</sup> |
| Total <sup>e</sup>                          | 499,000              | 523,000              | 539,000              | 621,800 <sup>5</sup>   | 603,900 <sup>5</sup> |
| <b>Mexico:<sup>e</sup></b>                  |                      |                      |                      |                        |                      |
| Primary                                     | 160,700              | 118,500              | 233,800              | 255,900                | 215,000              |
| Secondary                                   | 5,000                | 5,000                | 5,000                | 5,000                  | 5,000                |
| Total                                       | 166,000              | 124,000              | 239,000              | 261,000                | 220,000              |
| Namibia, primary <sup>e</sup>               | 21,500 <sup>r</sup>  | 31,900               | 43,800               | 39,800 <sup>r</sup>    | 38,100               |
| Oman, primary <sup>e</sup>                  | 12,000 <sup>r</sup>  | 9,000 <sup>r</sup>   | 12,000 <sup>r</sup>  | 12,000 <sup>r</sup>    | 12,000               |

See footnotes at end of table.



TABLE 21—Continued  
COPPER: WORLD SMELTER PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Metric tons, gross weight)

| Country <sup>3</sup>                      | 2009                    | 2010                    | 2011                    | 2012                    | 2013       |
|---|-------------------------|-------------------------|-------------------------|-------------------------|------------|
| Pakistan, primary                         | 17,500                  | 17,000                  | 16,500                  | 16,000                  | 16,000     |
| Peru, primary                             | 325,782                 | 312,968                 | 299,004                 | 290,088                 | 320,000    |
| Philippines, primary                      | 230,100                 | 216,200                 | 205,000                 | 97,000                  | 181,900    |
| Poland:                                   |                         |                         |                         |                         |            |
| Primary                                   | 427,800                 | 433,900                 | 449,000                 | 451,700                 | 456,100    |
| Secondary                                 | 68,800                  | 94,600                  | 82,100                  | 97,200                  | 98,700     |
| Total                                     | 496,600                 | 528,500                 | 531,100                 | 548,900                 | 554,800    |
| Russia: <sup>c</sup>                      |                         |                         |                         |                         |            |
| Primary                                   | 580,000                 | 590,000                 | 596,490 <sup>5</sup>    | 621,200 <sup>r,5</sup>  | 625,000    |
| Secondary                                 | 220,000                 | 240,000                 | 242,640 <sup>r,5</sup>  | 253,800 <sup>r,5</sup>  | 255,000    |
| Total                                     | 800,000                 | 830,000                 | 839,130 <sup>r,5</sup>  | 875,000 <sup>r,5</sup>  | 880,000    |
| Serbia: <sup>c</sup>                      |                         |                         |                         |                         |            |
| Primary                                   | 22,000                  | 23,000                  | 27,000                  | 33,000                  | 33,000     |
| Secondary                                 | 1,000                   | 1,000                   | 1,000                   | 1,000                   | 1,000      |
| Total                                     | 23,000                  | 24,000                  | 28,000                  | 34,000                  | 34,000     |
| Slovakia, secondary                       | 34,200                  | 46,500                  | 48,800                  | 41,700 <sup>c</sup>     | 18,500     |
| South Africa, primary                     | 86,900                  | 75,900                  | 82,400                  | 62,300 <sup>r</sup>     | 69,700     |
| Spain: <sup>c</sup>                       |                         |                         |                         |                         |            |
| Primary                                   | 260,000                 | 236,000                 | 231,300                 | 270,000 <sup>r</sup>    | 212,000    |
| Secondary                                 | 10,000                  | 19,000                  | 21,700                  | 25,000 <sup>r</sup>     | 14,000     |
| Total                                     | 270,000                 | 255,000                 | 253,000                 | 295,000 <sup>r</sup>    | 226,000    |
| Sweden:                                   |                         |                         |                         |                         |            |
| Primary                                   | 146,000 <sup>r</sup>    | 142,000 <sup>r</sup>    | 162,000 <sup>r</sup>    | 151,000 <sup>r</sup>    | 140,000    |
| Secondary <sup>c</sup>                    | 37,600 <sup>r</sup>     | 40,000 <sup>r</sup>     | 45,000 <sup>r</sup>     | 56,000 <sup>r</sup>     | 59,000     |
| Total <sup>c</sup>                        | 184,000 <sup>r</sup>    | 182,000 <sup>r</sup>    | 207,000 <sup>r</sup>    | 207,000 <sup>r</sup>    | 199,000    |
| Turkey, undifferentiated <sup>c,6</sup>   | 25,000                  | 25,000                  | 25,000                  | 25,000                  | 31,500     |
| United States, primary <sup>7</sup>       | 597,000                 | 601,000                 | 538,000                 | 485,000                 | 516,000    |
| Uzbekistan, undifferentiated <sup>c</sup> | 92,000                  | 92,000                  | 92,000                  | 93,000 <sup>r</sup>     | 93,000     |
| Vietnam, primary                          | 6,000                   | 8,000                   | 8,000                   | 8,000                   | 8,000      |
| Zambia, primary                           | 334,000                 | 490,000                 | 511,000                 | 515,000                 | 570,000    |
| Grand total                               | 14,900,000              | 15,600,000              | 15,900,000              | 16,200,000 <sup>r</sup> | 17,100,000 |
| Of which:                                 |                         |                         |                         |                         |            |
| Primary                                   | 12,100,000 <sup>r</sup> | 12,400,000 <sup>r</sup> | 12,500,000 <sup>r</sup> | 12,400,000 <sup>r</sup> | 13,200,000 |
| Secondary                                 | 2,400,000 <sup>r</sup>  | 2,680,000 <sup>r</sup>  | 3,050,000 <sup>r</sup>  | 3,320,000 <sup>r</sup>  | 3,480,000  |
| Undifferentiated                          | 460,000 <sup>r</sup>    | 446,000 <sup>r</sup>    | 430,000 <sup>r</sup>    | 431,000 <sup>r</sup>    | 404,000    |

<sup>c</sup>Estimated. <sup>r</sup>Revised.

<sup>1</sup>Grand totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes total production of smelted copper metal, including low-grade cathode produced by electrowinning methods. The smelter feed may be derived from ore, concentrates, copper precipitate or matte (primary) and (or) scrap (secondary). To the extent possible, primary and secondary output of each country is shown separately. In some cases, total smelter production is officially reported, but the distribution between primary and secondary has been estimated. Includes data available through July 29, 2015.

<sup>3</sup>Thailand produced secondary copper, but available information is inadequate to make reliable estimates of output levels.

<sup>4</sup>Copper content of nickel-copper matte exported to Norway for refining.

<sup>5</sup>Reported figure.

<sup>6</sup>Secondary production is estimated to be about one-third of total.

<sup>7</sup>May contain small amounts of scrap.

TABLE 22  
COPPER: WORLD REFINERY PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Metric tons)

| Country <sup>3</sup>                      | 2009                 | 2010                 | 2011                 | 2012                 | 2013                 |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| Argentina, secondary <sup>e</sup>         | 16,000               | 16,000               | 16,000 <sup>r</sup>  | 16,000 <sup>r</sup>  | 16,000               |
| Australia, primary:                       |                      |                      |                      |                      |                      |
| Electrowon                                | 23,000               | 14,400               | 35,600               | 43,000 <sup>r</sup>  | 45,000               |
| Other                                     | 423,000              | 410,000              | 441,000              | 417,000              | 430,000              |
| Total                                     | 446,000              | 424,400              | 476,600              | 460,000 <sup>r</sup> | 475,000              |
| Austria, secondary                        | 96,200               | 113,700              | 112,500              | 113,600 <sup>r</sup> | 108,100              |
| Belgium:                                  |                      |                      |                      |                      |                      |
| Primary <sup>4</sup>                      | 220,600              | 216,000              | 226,200              | 217,900 <sup>r</sup> | 202,500              |
| Secondary                                 | 153,100              | 165,000              | 168,000              | 178,800 <sup>r</sup> | 186,900              |
| Total                                     | 373,700              | 381,000              | 394,200              | 396,700 <sup>r</sup> | 389,400              |
| Bolivia, primary, electrowon              | 200 <sup>r</sup>     | 880 <sup>r</sup>     | 1,000 <sup>r</sup>   | 900 <sup>r</sup>     | 1,000 <sup>e</sup>   |
| Brazil:                                   |                      |                      |                      |                      |                      |
| Primary:                                  |                      |                      |                      |                      |                      |
| Electrowon                                | 6,500                | 4,497 <sup>r</sup>   | 4,550 <sup>r</sup>   | 4,374 <sup>r</sup>   | 4,000                |
| Other                                     | 224,900 <sup>r</sup> | 217,800 <sup>r</sup> | 218,000 <sup>r</sup> | 182,000 <sup>r</sup> | 230,000              |
| Total                                     | 231,400 <sup>r</sup> | 222,297 <sup>r</sup> | 222,550 <sup>r</sup> | 186,374 <sup>r</sup> | 234,000              |
| Secondary                                 | 21,000               | 23,000               | 22,800               | 24,700 <sup>r</sup>  | 27,800               |
| Total, primary and secondary              | 252,400 <sup>r</sup> | 245,297 <sup>r</sup> | 245,350 <sup>r</sup> | 211,074 <sup>r</sup> | 261,800              |
| Bulgaria:                                 |                      |                      |                      |                      |                      |
| Primary                                   | 183,600              | 195,400              | 201,100              | 201,000 <sup>e</sup> | 206,400              |
| Secondary <sup>e</sup>                    | 13,200               | 19,600               | 25,000               | 25,000               | 23,600               |
| Total <sup>e</sup>                        | 197,000              | 215,000              | 226,000              | 226,000              | 230,000              |
| Burma, primary, electrowon <sup>e</sup>   | 3,500 <sup>5</sup>   | 9,000 <sup>r,5</sup> | 9,000 <sup>r</sup>   | 19,000 <sup>r</sup>  | 20,000               |
| Canada:                                   |                      |                      |                      |                      |                      |
| Primary:                                  |                      |                      |                      |                      |                      |
| Electrowon                                | 1,000 <sup>r</sup>   | 800 <sup>r</sup>     | 1,000                | 900                  | --                   |
| Other                                     | 311,000 <sup>r</sup> | 290,000 <sup>r</sup> | 244,000 <sup>r</sup> | 246,000 <sup>r</sup> | 292,200              |
| Total                                     | 312,000 <sup>r</sup> | 290,800 <sup>r</sup> | 245,000 <sup>r</sup> | 246,900 <sup>r</sup> | 292,200              |
| Secondary <sup>e</sup>                    | 25,000 <sup>r</sup>  | 30,000 <sup>r</sup>  | 30,000 <sup>r</sup>  | 30,000 <sup>r</sup>  | 30,000               |
| Total, primary and secondary <sup>e</sup> | 337,000 <sup>r</sup> | 321,000 <sup>r</sup> | 275,000 <sup>r</sup> | 277,000 <sup>r</sup> | 322,000              |
| Chile, primary:                           |                      |                      |                      |                      |                      |
| Electrowon                                | 2,117,500            | 2,088,500            | 2,024,800            | 2,028,800            | 1,932,900            |
| Other                                     | 1,159,100            | 1,155,400            | 1,067,600            | 873,200              | 822,000              |
| Total                                     | 3,276,600            | 3,243,900            | 3,092,400            | 2,902,000            | 2,754,900            |
| China: <sup>e</sup>                       |                      |                      |                      |                      |                      |
| Primary:                                  |                      |                      |                      |                      |                      |
| Electrowon                                | 17,000               | 24,000               | 23,000               | 30,000               | 40,000               |
| Other                                     | 2,750,000            | 2,950,000            | 3,390,000            | 3,930,000            | 4,300,000            |
| Total                                     | 2,770,000            | 2,970,000            | 3,410,000            | 3,960,000            | 4,340,000            |
| Secondary                                 | 1,400,000            | 1,700,000            | 1,850,000            | 1,950,000            | 2,200,000            |
| Total, primary and secondary              | 4,170,000            | 4,670,000            | 5,260,000            | 5,910,000            | 6,540,000            |
| Congo (Kinshasa), primary, electrowon     | 166,917              | 260,759 <sup>r</sup> | 362,000 <sup>r</sup> | 475,000 <sup>r</sup> | 690,000 <sup>e</sup> |
| Cyprus, primary, electrowon               | 2,380                | 2,595                | 3,660                | 4,328                | 3,631                |
| Egypt, secondary <sup>e</sup>             | 3,000                | 3,000                | 3,000                | 3,000                | 3,000                |
| Finland: <sup>e</sup>                     |                      |                      |                      |                      |                      |
| Primary                                   | 97,000 <sup>r</sup>  | 109,000              | 117,000              | 120,000 <sup>r</sup> | 120,000              |
| Secondary                                 | 10,000               | 4,000                | 9,000                | 9,000                | 9,000                |
| Total                                     | 107,000 <sup>r</sup> | 113,000              | 126,000              | 129,000 <sup>r</sup> | 129,000              |
| Germany:                                  |                      |                      |                      |                      |                      |
| Primary                                   | 330,000 <sup>r</sup> | 401,900              | 401,200              | 390,000 <sup>e</sup> | 390,000              |
| Secondary                                 | 339,000 <sup>r</sup> | 302,400              | 308,000              | 295,700              | 287,600              |
| Total                                     | 669,000              | 704,300              | 709,200              | 686,000 <sup>e</sup> | 677,600              |

See footnotes at end of table.

TABLE 22—Continued  
COPPER: WORLD REFINERY PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Metric tons)

| Country <sup>3</sup>                      | 2009                 | 2010                 | 2011                   | 2012                   | 2013                |
|---|----------------------|----------------------|------------------------|------------------------|---------------------|
| <b>India:</b>                             |                      |                      |                        |                        |                     |
| Primary, other, electrolytic              | 705,100              | 654,900              | 671,100                | 690,000 <sup>r</sup>   | 610,000             |
| Secondary <sup>e</sup>                    | 10,000               | 9,000                | 2,000                  | 10,000                 | 12,000              |
| Total <sup>e</sup>                        | 715,000              | 664,000              | 673,000                | 700,000 <sup>r</sup>   | 622,000             |
| <b>Indonesia, primary</b>                 |                      |                      |                        |                        |                     |
| Electrowon                                | 1,127 <sup>r</sup>   | 1,392 <sup>r</sup>   | 900 <sup>r,e</sup>     | --                     | --                  |
| Other                                     | 286,000 <sup>r</sup> | 277,500 <sup>r</sup> | 274,900 <sup>r</sup>   | 197,200                | 214,300             |
| Total                                     | 287,127 <sup>r</sup> | 278,892 <sup>r</sup> | 276,000 <sup>r,e</sup> | 197,200                | 214,300             |
| <b>Iran:</b>                              |                      |                      |                        |                        |                     |
| Primary: <sup>e</sup>                     |                      |                      |                        |                        |                     |
| Electrowon                                | 7,000                | 7,000                | 10,000                 | 13,000                 | 14,000              |
| Other                                     | 150,000              | 143,000              | 149,000                | 136,000                | 121,000             |
| Total                                     | 157,000              | 150,000              | 159,000                | 149,000                | 135,000             |
| Secondary                                 | 53,000               | 70,000               | 68,000                 | 78,000 <sup>r</sup>    | 56,000              |
| Total, primary and secondary <sup>e</sup> | 210,000              | 220,000              | 227,000                | 227,000 <sup>r</sup>   | 191,000             |
| Italy, secondary <sup>e</sup>             | 6,500                | 2,000                | 2,000                  | 2,000                  | 2,000               |
| <b>Japan:</b>                             |                      |                      |                        |                        |                     |
| Primary                                   | 1,238,012            | 1,333,787            | 1,094,360              | 1,270,900 <sup>r</sup> | 1,210,200           |
| Secondary                                 | 201,831              | 214,901              | 233,238                | 245,400 <sup>r</sup>   | 257,900             |
| Total                                     | 1,439,843            | 1,548,688            | 1,327,598              | 1,516,300 <sup>r</sup> | 1,468,100           |
| <b>Kazakhstan, primary:</b>               |                      |                      |                        |                        |                     |
| Leaching, electrowon                      | --                   | --                   | --                     | 7,000 <sup>r,e</sup>   | 12,200              |
| Other                                     | 312,767              | 323,368              | 338,346                | 367,177 <sup>r</sup>   | 352,061             |
| Total                                     | 312,767              | 323,368              | 338,346                | 374,000 <sup>r,e</sup> | 364,261             |
| Korea, North, primary <sup>e</sup>        | 10,000               | 10,000               | 10,000                 | 10,000                 | 10,000              |
| <b>Korea, Republic of:</b>                |                      |                      |                        |                        |                     |
| Primary                                   | 448,600              | 462,200              | 486,900                | 493,200                | 495,400             |
| Secondary                                 | 90,300               | 97,000               | 106,600                | 96,200                 | 109,800             |
| Total                                     | 538,900              | 559,200              | 593,500                | 589,400                | 605,200             |
| Laos, primary, electrowon                 | 67,561               | 64,241               | 78,859                 | 86,295 <sup>r</sup>    | 90,000 <sup>e</sup> |
| Macedonia, primary, electrowon            | --                   | --                   | --                     | 1,100 <sup>r</sup>     | 1,900               |
| <b>Mexico:<sup>e</sup></b>                |                      |                      |                        |                        |                     |
| Primary:                                  |                      |                      |                        |                        |                     |
| Electrowon                                | 68,000               | 100,000              | 149,000                | 157,000                | 163,000             |
| Other                                     | 190,000              | 157,000              | 251,000                | 215,000                | 188,000             |
| Total                                     | 258,000              | 257,000              | 400,000                | 372,000                | 351,000             |
| Secondary                                 | 5,000                | 5,000                | 5,000                  | 5,000                  | 5,000               |
| Total, primary and secondary              | 263,000              | 419,000              | 656,000                | 592,000                | 544,000             |
| Mongolia, primary, electrowon             | 2,470                | 2,720                | 2,360                  | 2,260                  | 2,500               |
| Norway, primary <sup>e,6</sup>            | 30,000               | 36,000 <sup>r</sup>  | 36,000 <sup>r</sup>    | 38,000 <sup>r</sup>    | 38,000              |
| Oman, primary                             | 15,000               | 15,000               | 16,000                 | 16,000                 | 16,000              |
| <b>Peru, primary:</b>                     |                      |                      |                        |                        |                     |
| Electrowon                                | 162,795              | 153,022              | 140,341                | 101,174 <sup>r</sup>   | 89,658              |
| Other                                     | 260,618              | 240,616              | 227,320                | 210,119                | 271,792             |
| Total                                     | 423,413              | 393,638              | 367,661                | 311,293 <sup>r</sup>   | 361,450             |
| Philippines, primary                      | 178,000              | 176,000 <sup>r</sup> | 164,000                | 90,400                 | 153,000             |
| <b>Poland:</b>                            |                      |                      |                        |                        |                     |
| Primary                                   | 433,600              | 452,700              | 489,000                | 464,900                | 450,600             |
| Secondary                                 | 68,800               | 94,300               | 81,900                 | 99,400                 | 114,500             |
| Total                                     | 502,400              | 547,000              | 570,900                | 564,300                | 565,100             |
| <b>Romania:<sup>e</sup></b>               |                      |                      |                        |                        |                     |
| Primary                                   | 3,000                | --                   | --                     | --                     | --                  |
| Secondary                                 | 1,000                | --                   | --                     | --                     | --                  |
| Total                                     | 4,000                | --                   | --                     | --                     | --                  |

See footnotes at end of table.

TABLE 22—Continued  
COPPER: WORLD REFINERY PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Metric tons)

| Country <sup>3</sup>             | 2009                    | 2010                    | 2011                    | 2012                    | 2013               |
|----------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------|
| Russia: <sup>c</sup>             |                         |                         |                         |                         |                    |
| Primary:                         |                         |                         |                         |                         |                    |
| Electrowon                       | 3,300                   | 3,200                   | 2,700                   | 2,000                   | 2,000              |
| Other                            | 612,000                 | 656,000                 | 663,200 <sup>r</sup>    | 635,000 <sup>r</sup>    | 650,000            |
| Total                            | 615,000                 | 659,000                 | 666,000                 | 637,000                 | 652,000            |
| Secondary                        | 250,000                 | 218,000                 | 220,400 <sup>r</sup>    | 209,400 <sup>r</sup>    | 220,000            |
| Total, primary and secondary     | 865,000                 | 877,000                 | 886,000 <sup>r</sup>    | 846,000 <sup>r</sup>    | 872,000            |
| Serbia:                          |                         |                         |                         |                         |                    |
| Primary                          | 18,875                  | 21,240                  | 25,251                  | 32,229                  | 32,606             |
| Secondary                        | 1,186                   | 963                     | 3,198                   | 2,473                   | 3,234              |
| Total                            | 20,061                  | 22,203                  | 28,449                  | 34,702                  | 35,840             |
| South Africa, primary            | 89,453                  | 81,129                  | 86,166                  | 66,416 <sup>r</sup>     | 80,821             |
| Spain:                           |                         |                         |                         |                         |                    |
| Primary:                         |                         |                         |                         |                         |                    |
| Electrowon                       | 5,600                   | 28,500                  | 42,100                  | 67,700 <sup>r</sup>     | 69,300             |
| Other                            | 250,200                 | 236,000                 | 225,700                 | 250,500 <sup>r</sup>    | 213,500            |
| Total                            | 255,800                 | 264,500                 | 267,800                 | 318,200 <sup>r</sup>    | 282,800            |
| Secondary                        | 73,000                  | 82,900                  | 86,000                  | 88,300 <sup>r</sup>     | 68,200             |
| Total, primary and secondary     | 328,800                 | 347,400                 | 353,800                 | 406,500 <sup>r</sup>    | 351,000            |
| Sweden: <sup>c</sup>             |                         |                         |                         |                         |                    |
| Primary                          | 164,759 <sup>s</sup>    | 150,497 <sup>s</sup>    | 179,316 <sup>s</sup>    | 174,000 <sup>r</sup>    | 166,000            |
| Secondary                        | 41,000 <sup>s</sup>     | 40,000                  | 40,000                  | 40,000                  | 40,000             |
| Total                            | 205,759 <sup>s</sup>    | 190,000                 | 219,000                 | 214,000 <sup>r</sup>    | 206,000            |
| Taiwan, secondary <sup>c</sup>   | 4,500                   | 4,500                   | 4,500                   | 4,500                   | 4,500              |
| Turkey: <sup>c</sup>             |                         |                         |                         |                         |                    |
| Primary                          | 29,500 <sup>r</sup>     | 42,300 <sup>r</sup>     | 81,500 <sup>r</sup>     | 81,300 <sup>r</sup>     | 72,000             |
| Secondary                        | 4,000                   | 5,000                   | 5,000                   | 5,000                   | 5,000              |
| Total                            | 33,500 <sup>r</sup>     | 47,300 <sup>r</sup>     | 86,500 <sup>r</sup>     | 86,300 <sup>r</sup>     | 77,000             |
| Ukraine, secondary <sup>c</sup>  | 20,000                  | 20,000                  | 20,000                  | 20,000                  | 20,000             |
| United States:                   |                         |                         |                         |                         |                    |
| Primary:                         |                         |                         |                         |                         |                    |
| Electrowon                       | 476,000                 | 430,000                 | 447,000                 | 471,000                 | 475,000            |
| Other                            | 636,000                 | 627,000                 | 545,000                 | 491,000                 | 518,000            |
| Total                            | 1,110,000               | 1,060,000               | 992,000                 | 962,000                 | 993,000            |
| Secondary                        | 46,400                  | 37,700                  | 37,300                  | 39,400 <sup>r</sup>     | 46,900             |
| Total, primary and secondary     | 1,160,000               | 1,090,000               | 1,030,000               | 1,000,000               | 1,040,000          |
| Uzbekistan, primary <sup>c</sup> | 80,000                  | 90,000                  | 91,500 <sup>r</sup>     | 90,000                  | 90,000             |
| Vietnam, primary <sup>c</sup>    | 6,000                   | 8,000                   | 8,000                   | 8,000                   | 8,000              |
| Zambia, primary: <sup>c</sup>    |                         |                         |                         |                         |                    |
| Electrowon <sup>7</sup>          | 147,000 <sup>r</sup>    | 158,000 <sup>r</sup>    | 144,000 <sup>r</sup>    | 186,000 <sup>r</sup>    | 241,000            |
| Other                            | 294,000 <sup>r</sup>    | 370,000                 | 370,000                 | 340,000                 | 327,000            |
| Total                            | 441,000 <sup>r</sup>    | 528,000 <sup>r</sup>    | 514,000 <sup>r</sup>    | 526,000 <sup>r</sup>    | 568,000            |
| Zimbabwe, primary                | 4,000                   | 4,545                   | 4,355                   | 5,000 <sup>r</sup>      | 5,000 <sup>e</sup> |
| Grand total                      | 18,400,000 <sup>r</sup> | 19,100,000              | 19,700,000              | 20,200,000 <sup>r</sup> | 21,000,000         |
| Of which:                        |                         |                         |                         |                         |                    |
| Primary:                         |                         |                         |                         |                         |                    |
| Electrowon                       | 3,280,000 <sup>r</sup>  | 3,350,000 <sup>r</sup>  | 3,480,000 <sup>r</sup>  | 3,700,000 <sup>r</sup>  | 3,900,000          |
| Other                            | 12,100,000 <sup>r</sup> | 12,500,000 <sup>r</sup> | 12,800,000 <sup>r</sup> | 12,900,000 <sup>r</sup> | 13,300,000         |
| Total                            | 15,400,000 <sup>r</sup> | 15,900,000 <sup>r</sup> | 16,300,000 <sup>r</sup> | 16,700,000 <sup>r</sup> | 17,200,000         |
| Secondary                        | 2,950,000 <sup>r</sup>  | 3,280,000               | 3,460,000 <sup>r</sup>  | 3,590,000 <sup>r</sup>  | 3,860,000          |

<sup>c</sup>Estimated. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Grand totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes total production of refined copper whether produced by pyrometallurgical or electrolytic refining methods and whether derived from primary unrefined copper or from scrap. Copper cathode derived from electrowinning processing is also included. Includes data available through July 29, 2015.

TABLE 22—Continued  
COPPER: WORLD REFINERY PRODUCTION, BY COUNTRY<sup>1,2</sup>

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<sup>3</sup>Thailand produced secondary lead, but available information is inadequate to make reliable estimates of output levels.

<sup>4</sup>Includes reprocessed leach cathode from Congo (Kinshasa).

<sup>5</sup>Reported figure.

<sup>6</sup>May include secondary.

<sup>7</sup>Electrowon covers only high-grade electrowon cathodes reported as “finished production leach cathodes.”