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Copper

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In 2014, 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 1.36 million metric tons (Mt), about 9% greater than that of 2013, and the highest since 2000, when production was 1.45 Mt. The principal mining States for copper, in descending order of production, Arizona, Utah, New Mexico, Nevada, and Montana, accounted for more than 99% of domestic production; copper was also recovered at mines in Idaho, Michigan, and Missouri. Although copper was recovered at 27 mines in the United States during 2014, 19 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 slightly to 18.5 Mt. Chile's mined copper production was essentially unchanged and it remained the leading world producer. It accounted for 31% of global production and produced about 4.0 Mt more than the second-ranked producer, China, which accounted for 10% of global production. Peru was the third-ranked producer and accounted for 7% of global production. The remaining countries among the 10 leading producers were, in descending order of production, the United States, Congo (Kinshasa), Australia, Russia, Zambia, Canada, and Mexico. Fifty-two countries were known to have mined copper in 2014. The 10 leading producers accounted for 81% of production, and the 20 leading producers accounted for 94% of production (table 20).

Global smelter production increased by 5% in 2014, and refinery production rose by 6% owing to across-the-board increases in primary electrolytic and electrowon and secondary refinery production. The United States ranked 10th in copper smelter production and accounted for 3% of world production (table 21). The United States remained the fourth-leading producer behind China (32%), Chile (12%), and Japan (7%), and accounted for 5% of world refined copper production (table 22).

In 2014, copper recovered from refined or remelted scrap in the United States totaled 845,000 metric tons (t) (about 80% from new scrap and 20% from old scrap) and accounted for 35% of the total U.S. copper supply. The conversion of old scrap to alloys and refined copper increased by 4% to 173,000 t and was at its highest level since 2005 (tables 1, 6). In addition to scrap consumed domestically, an additional 1.05 Mt of scrap (gross weight) was exported, the majority of which was thought to be old scrap (table 18). Copper scrap exports were about 16% lower than the record-high exports in 2011, which had corresponded with the 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) (2015a, p. 9, 19–20), global consumption of refined copper in 2014 increased by about 7% and reached a record-high 22.9 Mt. China, where apparent consumption increased by 14% to about 11.0 Mt, accounted for 48% of global consumption and was the principal reason for the global increase in refined consumption. Consumption in the United States decreased by 4% and accounted for 8% of total global consumption. On a regional basis, in 2014, consumption increased by 11% in Asia (5% if China is excluded) and by 6% in the European Union, but decreased by 3% in North America. Consumption in Asia accounted for 65% of global consumption (17% excluding China), the European Union accounted for 14% of consumption, and North America accounted for 10%. 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.

From 2004 to 2014, global consumption of refined copper increased by 36%, a compound annual growth rate of about 3% per year, with slight decreases in 2005 and 2008. Over the same time period, apparent refined copper consumption in China more than tripled, with a compound annual growth rate of about 13% per year. According to ICSG estimates, global consumption of refined copper exceeded production by 406,000 t in 2014. This was the fifth consecutive year that global consumption of refined copper was greater than global production. Despite the apparent production shortfall, reported global yearend inventories of refined copper remained essentially unchanged at to 1.34 Mt, about 6% of annual consumption of refined copper (International Copper Study Group, 2014, p. 25; 2015a, p. 9).

In 2014, the annual average Commodity Exchange, Inc. (COMEX) spot price declined by about 7% to $3.12 per pound of copper. The annual average copper price reached a record-high $4.00 per pound in 2011 and declined to $3.61 in 2012 and $3.34 in 2013 (table 1).

Production

Domestic Industry Structure.—Mine production of recoverable copper in the United States increased by 9% to 1.36 Mt in 2014 as production in Arizona increased by 12% and output in other States increased slightly. The copper yield (the recoverable copper content per unit of ore mined) of ore concentrated in the United States increased by 18%, to 0.47% copper (table 1). Smelter production increased slightly and electrolytically refined copper production increased by 3%. Electrowon copper production from leach solutions increased by 8% and accounted for 38% and 49%, respectively, of mine

and refinery production (table 1). Fourteen solvent extraction–electrowinning (SX–EW) facilities operated during 2014.

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 2014, responses were received from 25 of the surveyed mines, and from all of the smelters and refineries.

Operating Property Reviews.—ASARCO LLC (Phoenix, AZ) produced a total of 171,000 t of copper at its three mines in Arizona. The Ray Mine produced 62,500 t of copper in concentrate (74,200 t in 2013) and 28,100 t of electrowon copper (28,800 t in 2013). The Mission Complex produced 60,800 t of copper in concentrate (52,600 t in 2013) and the Silver Bell Mine produced 19,400 t (19,900 t in 2013) of electrowon copper (Grupo México, S.A.B. de C.V., 2015, p. 33).

Capstone Mining Corp. (Canada) completed the purchase of the Pinto Valley Mine in Arizona from BHP Billiton (Australia and the United Kingdom) in October 2013. In 2014, Capstone's first full year of ownership, the Pinto Valley Mine produced about 62,700 t of copper in concentrate (42,000 t in 2013) and 2,400 t of electrowon copper cathode (4,000 t in 2013) from its residual leach operation. Concentrate production increased significantly following the restart of mining in December 2012, mining having been halted in January 2009 following the global economic slowdown and a decline in copper prices (Capstone Mining Corp., 2015, p. 22–23).

Production of copper at Freeport-McMoRan Copper & Gold Inc.'s (FCX) U.S. operations increased to 813,000 t in 2014 from 692,000 t in 2013 and accounted for 60% of all recoverable copper production in the United States in 2014. In Arizona, combined copper in concentrate and electrowon production at the Morenci Mine increased by 22% to 369,000 t, the Sierrita Mine increased by 14% to 88,000 t, and the Bagdad Mine increased by 10% to 108,000 t. Electrowon production at the Miami Mine decreased by 7% to 26,000 t, and electrowon production at the Safford Mine decreased by 5% to 63,000 t. In New Mexico, combined copper in concentrate and electrowon production at the Chino Mine increased by 46% to 113,000 t of copper in 2014 as production ramped up after the mine was restarted in 2011. Electrowon production at the Tyrone Mine decreased slightly to 43,000 t (Freeport-McMoRan Copper & Gold Inc., 2015b, p. 27).

The production increase at FCX's Morenci Mine was due to the completion of a project to expand mining and milling capacity of sulfide ores. The expanded mill began operations in May 2014, and was expected to reach full capacity in the first quarter of 2015. At full production, the expansion was projected to allow Morenci to produce up to 408,000 metric tons per year (t/yr) of copper in concentrate and electrowon cathode (Freeport-McMoRan Copper & Gold Inc., 2015b, p. 8).

At Kennecott Utah Copper LLC's (Magna, UT) Bingham Canyon Mine, production of mined copper decreased by 3% to 204,300 t (211,000 t in 2013). In April 2013, a rock slide halted production for 17 days and in 2014, production was still affected by ongoing recovery efforts. Although reported production of refined copper at the Kennecott refinery increased by 5% to 204,100 t (193,600 t in 2013), total refinery production was higher in 2013 because Rio Tinto plc (London, United Kingdom) did not include smelter and refinery production from purchased concentrates in 2013. Including production from purchased concentrates in 2013, refinery production in 2014 decreased slightly, owing to a 65-day maintenance shutdown at Kennecott's Garfield smelter during the fourth quarter of 2014 that interrupted the supply of anodes to the refinery. During 2014, Rio Tinto was in the early stages of a $660 million project to push back the south wall of the Bingham Canyon Mine and extend mine life to 2030 from 2018 (Rio Tinto plc, 2014, p. 29; 2015, p. 30–31, 197).

In 2014, production at KGHM International Ltd.'s (Canada) Robinson Mine (Nevada) decreased to 39,300 t of copper in concentrate from 48,900 t in 2013 owing to lower mill throughput, grades, and recoveries. Mill throughput decreased in part owing to a 26-day mill shutdown in the third quarter for maintenance. Production at KGHM's Carlota Mine (Arizona) increased to 10,400 t of copper in concentrate in 2014 from 9,660 t in 2013. Ore was depleted at the Carlota Mine and mining was completed in the fourth quarter of 2014, with leaching expected to continue through 2015 (KGHM International Ltd., 2015, p. 1, 7–10).

The Eagle Mine [Lundin Mining Corp. (Toronto, Ontario, Canada)] near Marquette, MI, began commercial production in November. The Eagle Mine is principally a nickel mine with significant byproduct copper and, by the end of 2014, it had produced 4,300 t of nickel and 3,900 t of copper in concentrate. In 2015, Lundin Mining expected the Eagle Mine to reach full production of 25,000 to 28,000 t/yr of nickel and 20,000 to 23,000 t/yr of copper in concentrate (Lundin Mining Corp., 2015, p. 2, 4, 18).

On September 30, 2013, Mercator Minerals Ltd. (Kingman, AZ, and Vancouver, British Columbia, Canada), the owner of the Mineral Park Mine (Arizona), announced that, owing to low commodity prices and challenging capital market conditions, the board of directors was considering strategic alternatives that included the sale of the company. On August 3, 2014, an agreement with Intergeo MMC Ltd. (British Virgin Islands) to combine the two companies' assets was abandoned after delays in receiving approval for the merger from the Russian Federal Anti-Monopoly Services (FAS). The approval from the FAS was necessary because Intergeo was part of ONEXIM Group, which was headquartered in Russia. The Mineral Park Mine halted mining operations on December 29 and laid off 383 workers, citing the decline in copper prices and the failure to sell the mine. In January 2015, Origin Mining Co. LLC (Elko, NV) purchased the Mineral Park Mine for $10 million and assumed $3.5 million of environmental obligations. Origin planned to keep the mine on care-and-maintenance status with a small amount of copper production from residual leaching until copper prices increased (Mercator Minerals Ltd., 2013; ONEXIM Group, 2014; Matson, 2015).

On December 17, 2012, Revett Minerals Inc. (Spokane Valley, WA) suspended production at its underground Troy Mine (Troy, MT) 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 2014 (Revett Minerals Inc., 2012).

Consumption

U.S. reported consumption of refined copper decreased by 4% in 2014. Consumption by wire-rod mills, which accounted for 73% of reported consumption, decreased by 3%, and consumption at brass mills, which accounted for 24% of consumption, decreased by 7% (table 5). According to data compiled by the American Bureau of Metal Statistics Inc. (2015), domestic apparent consumption of wire rod decreased slightly to 1.26 Mt from 1.27 Mt in 2013.

According to preliminary data from the Copper Development Association Inc. (2015, 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 2.38 Mt from 2.36 Mt in 2013. Since 2000, when shipments to the domestic market reached a record high of 4.34 Mt, shipments to the domestic market have trended downward and shipments in 2014 were 45% below those in 2000. In 2014, domestic wire-mill products accounted for about 54% of total shipments to the domestic market; brass mill products, 40%; and foundry and powder products, 3%. Net imports, which also have trended downward from a peak of 6% market share in 2000, made up the remaining 3% of shipments. 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 (18% market share), to the transportation equipment sector (19% market share), and to the industrial machinery and equipment sector (7% market share) were also essentially unchanged; shipments to the consumer and general products sector (12% market share) increased by 4%.

Prices and Stocks

In 2014, the annual average COMEX spot price declined for the third consecutive year, decreasing by about 7% to $3.12 per pound from $3.34 per pound in 2013 and by 22% from the record high of $4.00 per pound in 2011. In 2014, the monthly average price ranged from a high of $3.36 per pound in January to a low of $2.90 per pound in December. Daily prices ranged from a high of $3.43 per pound on January 2 to a low of $2.84 per pound on December 26. 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 consumption. Total U.S. refined copper stocks decreased by 25% during the year to 193,000 t at the end of December from 258,000 t at the beginning of January, mainly owing to a drawdown of London Metal Exchange Ltd. stocks held in U.S. warehouses.

Copper scrap prices (table 13) generally followed the trend in refined copper prices, and scrap prices for various types of scrap decreased by 3% to 7%. According to American Metal Market price data, the discount for refiners' No. 2 scrap from the COMEX spot price averaged 28.6 cents per pound in 2014, continuing its downward trend from 49.3 cents per pound in 2011. In 2014, the refiners' No. 2 scrap discount ranged between 32.6 cents per pound in February and 26.3 cents per pound in July, and the refiners' No. 2 scrap price averaged $2.83 per pound, 7% less than in 2013.

Foreign Trade

Net imports of refined copper in 2014 were 493,000 t (620,000 t of imports and 127,000 t of exports), a decrease of about 21% compared with the 623,000 t (734,000 t of imports and 111,000 t of exports) in 2013 (tables 14, 16). Refined copper accounted for 95% of all unmanufactured copper imports and 13% of exports. Chile, Canada, and Mexico were the leading sources of refined copper imports in 2014, accounting for 51%, 31%, and 14%, respectively, of refined imports. Exports of copper ore and concentrate increased by 18% and exports of refined copper increased by 14%.

In 2014, according to U.S. Census Bureau data compiled by the Copper and Brass Fabricators Council Inc., U.S. imports of copper and copper-alloy semifabricated products (excluding wire-rod mill products) were 239,000 t (7% greater than those in 2013), exports were 115,000 t (a 3% decrease from those in 2013), and the resulting net imports increased by about 18% to 124,000 t. The leading import sources were Germany (22%), the Republic of Korea (16%), Mexico (10%), Canada (9%), and China (9%). The leading export destinations were Mexico (36%), Canada (29%), and the Republic of Korea (7%) (Copper and Brass Fabricators Council Inc., 2015, p. 1–9).

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 decreased by 9% to a total of 1.05 Mt (430,000 t of unalloyed copper scrap and 616,000 t of copper-alloy scrap) in 2014, compared with 1.16 Mt (449,000 t of unalloyed copper scrap and 706,000 t of copper-alloy scrap) in 2013. The decrease in copper scrap exports was almost entirely owing to a 117,000-t (14%) decrease in exports to China. In 2011, total U.S. scrap exports reached a record high of 1.24 Mt, with 940,000 t of those exports going to China. Based on global import data for 2014, China was the recipient of 56% of the reported 6.97 Mt of global copper scrap trade (Brininstool, 2015; International Copper Study Group 2015a, p. 40–41).

World Review

World mine production of copper increased slightly in 2014 from that in 2013 to a record-high 18.5 Mt (table 20). According to data compiled by the ICSG (2015a, p. 9), world capacity increased by 931,000 t (4%) to 21.7 million metric tons per year (Mt/yr) in 2014 from 20.8 Mt/yr in 2013, and by 2.6 Mt (14%) from 19.1 Mt/yr in 2009. Based on ICSG production and capacity data, worldwide capacity utilization at copper-producing mines worldwide decreased to 85.2% in 2014 from 87.8% in 2013.

Chile was the leading producer of mined copper in 2014 and produced 5.7 Mt, or 31% of total world production, followed by China, 1.8 Mt (10%); Peru, 1.4 Mt (7%); and the United States, 1.4 Mt (7%). Significant production increases occurred in Canada (63,600 t), China (160,000 t), Congo (Kinshasa) (60,000 t), Mongolia (62,200 t), and the United States (108,000 t). The most significant decreases in production were in Indonesia (130,000 t) and Zambia (52,000 t) (table 20).

In 2014, world production of refined copper increased by about 6% to 22.2 Mt owing to increases in both primary and secondary production (table 22). Production of refined copper from electrowinning rose by 5%, from electrolytic and fire refining (other primary) by 7%, and production from secondary refining (from scrap) increased slightly. Most of the growth in refined copper production was in China, where total refined copper production increased by an estimated 660,000 t (10%); Congo (Kinshasa), which increased production by 200,000 t (29%); India, by 143,000 t (23%); Japan, by 85,900 t (6%); and the United States, by 54,600 t (5%). Significant decreases in refined copper production took place in Kazakhstan, where output declined by 58,300 t (16%), and Zambia, by 58,000 t (10%).

According to ICSG data, world apparent consumption of refined copper rose by about 7% to a record-high 22.9 Mt in 2014 from 21.4 Mt in 2013. Stocks held on the more visible commodity exchanges (COMEX, LME, SHFE) decreased by about 40% to 306,000 t from 507,000 t in 2013. ICSG estimates of total reported stocks (exchanges and industry) increased slightly to 1.34 Mt from 1.32 Mt in 2013 as the decrease in exchange stocks was offset by a 27% increase in producers' stocks to 932,000 t from 734,000 t in 2013 (International Copper Study Group, 2015a, p. 9, 20–21).

Canada.—Canada's copper mine output increased by a reported 63,600 t (10%) owing to production increases at a number of mines. The most significant increase occurred at the Mount Milligan Mine [Thompson Creek Metals Co. Inc. (Denver, CO)], which began production in September 2013 and ramped up production to 29,300 t from 4,700 t in 2013 (Thompson Creek Metals Co. Inc., 2014, 2015).

China.—The significant increase in refined copper production in China correlated with a reported increase in smelting and refining capacity. In 2014, China reportedly added 650,000 t/yr of smelting capacity and 900,000 t/yr of refining capacity, with total capacities reaching 6.55 Mt/yr and 9.86 Mt/yr, respectively. Imports of copper ores and concentrates into China increased to 11.8 Mt (3.3 Mt of contained copper) from 10.1 Mt (2.8 Mt of contained copper) in 2013 and from 7.8 Mt (2.2 Mt of contained copper) in 2012. In 2014, China also imported 3.9 Mt of copper and copper-alloy scrap (4.4 Mt in 2013), 3.6 Mt of refined copper (3.2 Mt in 2013), and 584,700 t of copper blister and anodes (628,900 t in 2013) (Copper Monthly, 2015, p. 5–6; International Copper Study Group, 2015a, p. 24–28, 40).

Congo (Kinshasa).—In 2014, mine output of copper increased by an estimated 6% (60,000 t) to 1.03 Mt, and refined production increased by an estimated 29% (200,000 t) to 890,000 t. Mine and refinery production both increased mainly owing to increased production at Katanga Mining Ltd.'s Kamoto Mine and Luilu refinery, and at the Mutanda Mine [Glencore plc, 69%; Fleurette Group (Amsterdam, the Netherlands), 31%]. At the Kamoto Mine, production of copper in concentrate increased by 13% to 182,000 t, and production of cathode at the Luilu SX–EW facility increased by 16% to 158,000 t. The Mutanda Mine increased copper production to 197,100 t in 2014 from 150,600 t in 2013 owing to the ramping up of production to full capacity of 200,000 t/yr. The Mutanda Mine produced electrowon copper, although a small percentage may have been copper contained in concentrate (Glencore plc, 2015, p. 13; Katanga Mining Ltd., 2015).

India.—Refined copper production in India increased by 23% to 765,000 t owing to rampup following temporary production stoppages at India's two biggest smelters during 2013. The Tuticorin smelter and refinery [Sterlite Industries (Mumbai)] increased production in 2014 after having been forced to halt production on March 30, 2013, while it was being investigated for exceeding emissions standards. An environmental court found no evidence of excess pollution by the plant, and it was able to restart production in June 2013. The Birla smelter and refinery [Hindalco Industries Ltd. (Mumbai)] was closed for 35 days in 2013 for scheduled maintenance (Das, 2013; Thomson Reuters, 2013).

Indonesia.—Mine production in Indonesia decreased by 30% owing to decreased production at FCX's PT Freeport Indonesia (PT–FI) operations in the Grasberg minerals district. PT–FI decreased production by 30% to 295,000 t of recoverable copper (421,000 t in 2013) in response to a Government-imposed export tax. In January 2014, the Government of Indonesia announced that exports of copper concentrate would be banned beginning in January 2017. In 2014, prior to the export ban, an export tax of 25% would be charged that would gradually increase to 60% by mid-2016. After January 2017, copper concentrates would need to be processed into metal before being exported. In response, FCX halted exports of copper concentrate through July 25, when a new memorandum of understanding between FCX and the Government was signed. FCX was also examining options for developing new copper smelting and refining capacity in Indonesia (Freeport-McMoRan Copper & Gold Inc., 2015a, p. 49, 118; 2015b, p. 66).

In April, Finders Resources Ltd. (Australia) commissioned a 3,000-t/yr SX–EW demonstration plant on Wetar Island. By yearend, it had produced 1,400 t of copper and was in the process of building a 25,000-t/yr SX–EW facility. The company reported reserves of 8.9 Mt of ore grading 2.4% copper and projected mine production of 155,000 t of cathodes during the life of the mine (Finders Resources Ltd., 2015, p. 5–9).

Japan.—Japan's refined production increased by 6% to 1.55 Mt in 2014 from 1.47 Mt in 2013, reportedly in response to strong domestic demand. Copper consumption in Japan was partially supported by infrastructure investments in the northeast region to rebuild damage from the 2011 earthquake and tsunami and in Tokyo to prepare for the 2020 Olympics. In 2014, Japan's smelters and refineries also benefited from relatively high treatment and refining charges (TC/RCs), the processing charges levied against the value of purchased or tolled concentrates. Pan Pacific Copper's TC/RCs for FCX's copper concentrates increased to $92 per metric ton of concentrate in 2014 from $70 per metric ton in 2013 (Obayashi, 2014).

Kazakhstan.—The 58,300-t (16%) decrease in refinery production in Kazakhstan was thought to be due to reduced refinery production at the Zhezkazgan refinery, although reported production data were not available for that refinery for 2014. On October 31, Kazakhmys plc (London, United Kingdom) completed restructuring that included selling some of its assets in Kazakhstan to Cuprum Holding (the Netherlands).

At that time, Kazakhmys changed its name to KAZ Minerals plc (Kazakhmys plc, 2014).

Mongolia.—In 2014, Mongolia's significant increase in mine production was due to the ramping up of production at the Oyu Tolgoi Mine [Turquoise Hill Resources Ltd. (Canada), 66%; Government of Mongolia, 34%]. Oyu Tolgoi increased production to 148,400 t of copper in concentrate in 2014 from 76,700 t in 2013. The company forecast production of 175,000 to 195,000 t of copper in concentrate in 2015 (Turquoise Hill Resources Ltd., 2015, p. 8–9).

Zambia.—Copper mine production in Zambia decreased by 7% mainly owing to decreased production at Barrick Gold Corp.'s (Canada) Lumwana Mine, First Quantum Ltd.'s (Canada) Kansanshi Mine, and Vedanta Resources plc's (United Kingdom) KCM Mines. At the Lumwana Mine, production decreased by 18% to 97,100 t from 118,000 t in 2013 owing mainly to the partial collapse of a conveyor that shut down concentrate production for most of the second quarter. Production at the Kansanshi Mine decreased by 4% to 262,300 t from 270,700 t in 2013 partly owing to smelter capacity constraints. Output at KCM Mines decreased by 14% to 120,400 t from 139,900 t in 2013 owing to remediation work at two shafts at the Konkola Mine (Barrick Gold Corp., 2015, p. 42, 61; First Quantum Minerals Ltd., 2015, p. 9, 34; Lisulo, 2015; Vedanta Resources plc, 2015, p. 8).

In December, First Quantum Minerals began commissioning the Sentinel Mine, which was expected to produce between 150,000 and 200,000 t/yr of copper in concentrate. First Quantum also produced its first anode at a newly constructed smelter in December. The new smelter had a planned production capacity of 300,000 t/yr of anode and would process concentrates from both the Kansanshi Mine and the Sentinel Mine (First Quantum Minerals Ltd., 2015, p. 16–17).

On December 18, the Government of Zambia changed the country's mining tax regime and increased the royalty tax rate to 20% from 6%. In response to the increase, Barrick announced that the Lumwana Mine would be placed on care-and-maintenance status as the new tax rate made operation of the mine uneconomical. The shutdown was expected to be completed in the second quarter of 2015 (Barrick Gold Corp., 2015, p. 62).

Refinery production in Zambia decreased by 10% partly owing to decreased production by Mopani Copper Mines plc [Glencore plc (Switzerland), 73.1%]. Electrolytic cathode production by Mopani decreased by 13% to 185,100 t from 212,000 t in 2013, mainly owing to reduced processing of third party concentrates at its Mufulira smelter (Glencore plc, 2015, p. 13).

Outlook

Based on preliminary estimates for 2015, U.S. mine production is expected to decrease by about 8%, mainly owing to a significant decrease in production at the Bingham Canyon Mine during efforts to stabilize the east wall of the mine. Production is also expected to decrease at FCX and ASARCO mines based on announced closures and reduced production beginning in September 2015 owing to a continued decline in copper prices. Smelter production is expected to decrease slightly, and refinery production is expected to decrease by about 5% owing to decreases in both electrolytic and electrowon production.

In October 2015, the ICSG forecast that global mine production would increase slightly in 2015 and by about 4% in 2016. In 2015, global apparent refined copper consumption is expected to decline slightly, and refined copper consumption and production are expected to balance, whereas in 2016, apparent refined copper consumption would increase by 3%, and there would be a refined copper deficit of 127,000 t owing to consumption growth exceeding production growth. In April 2015, the ICSG forecast surpluses of 360,000 t and 230,000 t for 2015 and 2016, respectively, but these forecasts were revised after a number of production cuts were announced owing to lower copper prices (International Copper Study Group, 2015b).

References Cited

American Bureau of Metal Statistics Inc. 2015, Copper wirerod market—Covering full year 2014: Chatham, NJ, American Bureau of Metal Statistics Inc., March 12, 8 p.

Barrick Gold Corp., 2015, Annual report 2014: Toronto, Ontario, Canada, Barrick Gold Corp., 172 p. (Accessed June 25, 2015, at http://s1.q4cdn.com/808035602/files/annual-report/Barrick-Annual-Report-2014.pdf.)

Brininstool, Mark, 2015, Copper [advance release], *in* Metals and minerals: U.S. Geological Survey Minerals Yearbook 2012, v. I, p. 20.1–20.27. (Accessed May 20, 2016, at http://minerals.usgs.gov/minerals/pubs/commodity/copper/myb1-2012-coppe.pdf.)

Capstone Mining Corp., 2015, Management's discussion and analysis of Capstone Mining Corp. for the year ended December 31, 2014, *in* Consolidated financial statements—December 31, 2014 and 2013: Vancouver, British Columbia, Canada, Capstone Mining Corp., February 20, 58 p. (Accessed August 20, 2015, at http://s2.q4cdn.com/231101920/files/doc_financials/q42014/2014-YE-Financial-Statements-and-MDA.pdf.)

Copper and Brass Fabricators Council Inc., 2015, Copper and brass products import and export report—December 2014: Washington, DC, Copper and Brass Fabricators Council Inc., February 11, 240 p.

Copper Development Association Inc., 2015, Annual data 2015—Copper supply and consumption: New York, NY, Copper Development Association Inc., 21 p.

Copper Monthly, 2015, Copper & copper fabrication monthly for January 2015: Copper Monthly [published by Beijing Antaike Information Development Co., Ltd., or Antaike], no. 217, January, 26 p.

Das, K.N., 2013, Update 1—Indian court rules Sterlite copper smelter can stay open: Thomson Reuters, July 15. (Accessed December 17, 2015, at http://www.reuters.com/article/india-sterlite-idUSL4N0FL1YY20130715.)

Finders Resources Ltd., 2015, Annual report 2014: West Perth, Western Australia, Australia, Finders Resources Ltd., April 28, 67 p. (Accessed May 27, 2015, at http://findersresources.com/wp-content/uploads/2015/04/2014-Finders-Annual-Report.pdf.)

First Quantum Minerals Ltd., 2015, 2014 annual report: Vancouver, British Columbia, Canada, First Quantum Minerals Ltd., 113 p. (Accessed December 2, 2015, at http://s1.q4cdn.com/857957299/files/doc_financials/2014/FQM-2014_ANNUAL-REPORT.pdf.)

Freeport-McMoRan Copper & Gold Inc., 2015a, 2014 annual report: Phoenix, AZ, Freeport-McMoRan Copper & Gold Inc., April, 141 p. (Accessed September 3, 2015, at http://s2.q4cdn.com/089924811/files/doc_financials/annual/2014/FCX_AR_2014.pdf.)

Freeport-McMoRan Copper & Gold Inc., 2015b, Form 10–K—2014: U.S. Securities and Exchange Commission, 212 p. (Accessed August 12, 2015, at http://d1lge852tjjqow.cloudfront.net/CIK-0000831259/396a6e56-7402-4689-8d7d-eec89c948de3.pdf.)

Glencore plc, 2015, Corporate update and production report for the 12 months ended 31 December 2014: Baar, Switzerland, Glencore plc news release, February 11, 20 p. (Accessed April 7, 2015, at http://www.glencore.com/assets/investors/doc/reports_and_results/2014/GLEN-2014-Q4-Production-Report.pdf.)

Grupo México, S.A.B. de C.V., 2015, Annual report—2014: Mexico City, Mexico, Grupo México, S.A.B. de C.V., 155 p. (Accessed November 3, 2015, at http://www.gmexico.com/images/pdf/ReportesEng/Annual%20Report%202014%20Grupo%20M%C3%A9xico.pdf.)
International Copper Study Group, 2014, ICSG 2014 statistical yearbook (2004–2013): Lisbon, Portugal, International Copper Study Group, v. 11, October, 79 p.
International Copper Study Group, 2015a, Copper bulletin: Lisbon, Portugal, International Copper Study Group, v. 22, no. 11, November, 53 p.
International Copper Study Group, 2015b, Copper market forecast 2015/2016: Lisbon, Portugal, International Copper Study Group, October 6. (Accessed December 17, 2015, at http://www.icsg.org/index.php/press-releases/finish/113-forecast-press-release/2076-2015-10-icsg-forecast-press-release.)
Katanga Mining Ltd., 2015, Katanga Mining announces 2014 year end operational highlights: Zug, Switzerland, Katanga Mining Ltd. media release, February 10, 4 p. (Accessed December 14, 2015, at http://www.katangamining.com/~/media/Files/K/Katanga-mining-v2/media/newsreleases/news2015/02-10-2015.pdf.)
Kazakhmys plc, 2014, Kazakhmys announces completion of restructuring and change of name to KAZ Minerals plc: London, United Kingdom, Kazakhmys plc news release, October 31. (Accessed December 15, 2015, at http://www.kazminerals.com/en/investors_media/news/press_release.jsp?id=1793.)
KGHM International Ltd., 2015, Management discussion and analysis for the year and fourth quarter ended December 31, 2014: Vancouver, British Columbia, Canada, KGHM International Ltd., March 16, 24 p. (Accessed August 18, 2015, at http://kghm.com/en/investors/kghm-international.)
Lisulo, Stuart, 2015, Zambia records decline in 2014 copper production: The Post [Lusaka, Zambia], February 1. (Accessed August 5, 2015, at http://www.postzambia.com/news.php?id=5700.)
Lundin Mining Corp., 2015, Management's discussion and analysis for the year ended December 31, 2014: Toronto, Ontario, Canada, Lundin Mining Corp., February 18, 46 p. (Accessed March 18, 2015, at http://www.lundinmining.com/i/pdf/2014YE.pdf.)
Matson, Zachary, 2015, Judge approves $10 million sale of Mineral Park Mine: Today's News-Herald [Lake Havasu City, AZ], January 21. (Accessed February 4, 2015, at http://www.havasunews.com/news/judge-approvesmillion-sale-of-mineral-park-mine/article_c0314bfe-a128-11e4-b42f-4397c92be1cb.html.)
Mercator Minerals Ltd., 2013, Mercator Minerals advances exploration of strategic alternatives: Kingman, AZ, and Vancouver, British Columbia, Canada, Mercator Minerals Ltd. news release, September 30. (Accessed November 14, 2014, at http://www.sedar.com/DisplayCompanyDocuments.do?lang=EN&issuerNo=00007869.)
Obayashi, Yuka, 2014, Update 2—Japan H1 copper output to rise 4 pct on solid local demand, higher fees: Thomson Reuters, April 7. (Accessed December 16, 2015, at http://www.reuters.com/article/japan-copper-output-idUSL3N0MZ0RD20140407.)
ONEXIM Group, 2014, ONEXIM Group will not extend the term of the proposed merger between Intergeo and Mercator Minerals: Moscow, Russia, ONEXIM Group press release, August 3. (Accessed March 20, 2015, at http://www.onexim.org/media/pressreleases/384/.)
Revett Minerals Inc., 2012, Revett announces temporary suspension of underground operations at Troy Mine: Spokane Valley, WA, Revett Minerals Inc. press release, December 17. (Accessed August 26, 2013, at http://www.revettminerals.com/sites/default/files/news_releases/rvm-12172012-en.pdf.)
Rio Tinto plc, 2014, 2013 annual report: London, United Kingdom, Rio Tinto plc, 244 p. (Accessed May 6, 2014, at http://www.riotinto.com/documents/RT_Annual_report_2013.pdf.)
Rio Tinto plc, 2015, 2014 annual report: London, United Kingdom, Rio Tinto plc, 228 p. (Accessed June 3, 2015, at http://www.riotinto.com/documents/RT_Annual_report_2014.pdf.)
Thompson Creek Metals Co. Inc., 2014, Thompson Creek Metals Company announces fourth quarter and full year 2013 production and sales results and provides update on operations: Denver, CO, Thompson Creek Metals Co. Inc. press release, January 13. (Accessed December 17, 2015, at http://www.thompsoncreekmetals.com/i/pdf/nr/2014-01-13_NR.pdf.)
Thompson Creek Metals Co. Inc., 2015, Thompson Creek reports 2014 production results and announces 2015 guidance: Denver, CO, Thompson Creek Metals Co. Inc. press release, January 19. (Accessed December 17, 2015, at http://www.thompsoncreekmetals.com/i/pdf/nr/2015-01-19_NR.pdf.)
Thomson Reuters, 2013, UPDATE 1—India's top copper smelter can operate until at least July second week: Thomson Reuters, June 10. (Accessed December 17, 2015, at http://www.reuters.com/article/india-sterlite-smelter-idUSL3N0EM1KZ20130610.)
Turquoise Hill Resources Ltd., 2015, Management's discussion and analysis of financial condition and results of operations—December 31, 2014: Vancouver, British Columbia, Canada, Turquoise Hill Resources Ltd., 50 p.
Vedanta Resources plc, 2015, Production results for the third quarter ended 31 December 2014: London, United Kingdom, Vedanta Resources plc, 15 p. (Accessed December 15, 2015, at http://www.vedantaresources.com/media/171132/vedanta_q3_press_release_final.pdf.)

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

Copper. Ch. in Mineral Commodity Summaries, annual.
Copper. Ch. in United States Mineral Resources, Professional Paper 820, 1973.
Copper. Mineral Industry Surveys, monthly.
Copper (Cu). Ch. in Metal Prices in the United States Through 2010, Scientific Investigations Report 2012–5188, 2013.
Copper Recycling in the United States. Circular 1196–X.
The Nature and Use of Copper Reserve and Resource Data. Professional Paper 907–F, 1981.

Other

American Bureau of Metal Statistics nonferrous metal data.
International Copper Study Group, Copper Bulletin, monthly.
International Copper Study Group, Directory of Copper Mines and Plants.

TABLE 1
SALIENT COPPER STATISTICS[1]

(Metric tons, unless otherwise specified)

		2010	2011	2012	2013	2014
United States:						
Mine production:						
Ore concentrated	thousand metric tons	160,000	187,000	180,000	172,000	175,000
Average yield of concentrated ore	percent	0.41	0.34	0.36	0.40	0.47
Recoverable copper:						
Arizona		703,000	751,000	763,000	795,000	893,000
Other States		406,000	362,000	404,000	453,000	464,000
Total		1,110,000	1,110,000	1,170,000	1,250,000	1,360,000
Total value	millions	$8,520	$9,960	$9,450	$9,360	$9,510
Smelter production:						
Primary[2]		601,000	538,000	485,000	516,000	522,000
Byproduct sulfuric acid, sulfur content	thousand metric tons	704	679	545	574	439
Refinery production:						
Primary materials:						
Electrolytic from domestic ores		606,000	545,000	491,000	518,000	535,000
Electrolytic from foreign materials		21,000	--	--	--	--
Electrowon		430,000	447,000	471,000	475,000	514,000
Total		1,060,000	992,000	962,000	993,000	1,050,000
Secondary materials (scrap), electrolytic and fire refined		37,700	37,300	39,400	46,900	46,000
Total, refinery production		1,090,000	1,030,000	1,000,000	1,040,000	1,090,000
Secondary copper produced:						
Recovered from new scrap		642,000	649,000	642,000	630,000	672,000
Recovered from old scrap		143,000	153,000	164,000	166,000	173,000
Total		785,000	802,000	807,000	797,000 r	845,000
Copper sulfate production		23,700	22,800	22,500	23,000	22,900
Exports, refined		78,300	40,400	169,000 r	111,000 r	127,000
Imports, refined		605,000	670,000	630,000	734,000	620,000
Stocks, December 31:						
Blister and in-process material		21,100	13,000	12,300	12,700	9,860
Refined copper:						
Refineries		10,300	8,360	12,900	15,000	9,540
Wire-rod mills		19,700	24,000	28,100	32,600	42,000
Brass mills		6,400	6,850	6,540	6,710	7,710
Other industry		4,380	4,330	4,180	4,230	7,560
COMEX		58,600	79,800	64,100	15,000	24,200
London Metal Exchange (LME), U.S. warehouses		284,000	286,000	120,000	185,000	102,000
Total		384,000	409,000	236,000	258,000	193,000
Consumption:						
Refined copper, reported		1,760,000	1,760,000	1,760,000	1,830,000	1,750,000
Apparent consumption, primary refined and old scrap[3]		1,760,000	1,730,000	1,760,000 r	1,760,000 r	1,770,000
Price:						
Producer, weighted average	cents per pound	348.34	405.85	367.28	339.94	318.05
COMEX, first position	do.	342.51	400.05	361.45	334.11	312.00
LME, Grade A cash	do.	341.74	399.79	360.58	332.29	311.10
World, production:						
Mine	thousand metric tons	16,100	16,100	16,900	18,200 r	18,500
Smelter	do.	15,600	15,900	16,100 r	17,100	17,900
Refinery	do.	19,100	19,700	20,200	21,000	22,200

rRevised. do. Ditto. -- Zero.

[1]Data are rounded to no more than three significant digits, except prices; may not add to totals shown.

[2]May contain small amounts of scrap.

[3]In 2010, 2011, 2012, 2013, and 2014, apparent consumption is calculated using general imports of 583,000 metric tons (t), 649,000 t, 628,000 t, 729,000 t, and 614,000 t, respectively.

TABLE 2
LEADING COPPER-PRODUCING MINES IN THE UNITED STATES IN 2014, IN ORDER OF OUTPUT[1]

Rank	Mine	County and State	Operator	Source of copper	Capacity (thousand metric tons)
1	Morenci	Greenlee, AZ	Freeport-McMoRan Copper & Gold Inc.	Copper-molybdenum ore, concentrated and leached	380
2	Bingham Canyon	Salt Lake, UT	Kennecott Utah Copper LLC[2]	Copper-molybdenum ore, concentrated	280
3	Chino	Grant, NM	Freeport-McMoRan Copper & Gold Inc.	Copper ore, concentrated and leached	130
4	Bagdad	Yavapai, AZ	do.	do.	100
5	Sierrita	Pima, AZ	do.	do.	80
6	Ray	Pinal, AZ	ASARCO LLC[3]	do.	150
7	Pinto Valley	Gila, AZ	Capstone Mining Corp.	do.	60
8	Safford	Graham, AZ	Freeport-McMoRan Copper & Gold Inc.	Copper ore, leached	110
9	Mission Complex	Pima, AZ	ASARCO LLC[3]	Copper ore, concentrated	70
10	Tyrone	Grant, NM	Freeport-McMoRan Copper & Gold Inc.	Copper ore, leached	45
11	Robinson	White Pine, NV	KGHM International Ltd.	Copper-molybdenum ore, concentrated	60
12	Continental Pit	Silver Bow, MT	Montana Resources	do.	40
13	Miami	Gila, AZ	Freeport-McMoRan Copper & Gold Inc.	Copper ore, leached	90
14	Phoenix	Lander, NV	Newmont Mining Corp.	Gold-copper ore, concentrated	40
15	Silver Bell	Pima, AZ	ASARCO LLC[3]	Copper ore, leached	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	Eagle	Marquette, MI	Lundin Mining Corp.	Nickel-copper ore, concentrated	4

do. Ditto.

[1]The mines listed accounted for more than 99% of U.S. mine production in 2014.

[2]Wholly owned subsidiary of Rio Tinto plc.

[3]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[1]

(Metric tons)

Source and treatment process	2013		2014	
	Gross weight	Recoverable copper	Gross weight	Recoverable copper
Mined copper ore:				
Concentrated	172,000,000	731,000 r	175,000,000	819,000
Leached	NA	475,000	NA	514,000
Total	NA	1,210,000 r	NA	1,330,000
Copper precipitates shipped, leached from tailings, dumps, and in-place material	NA	W	NA	W
Other copper-bearing ores[2]	5,480,000	42,400 r	5,620,000	24,500
Grand total	XX	1,250,000	XX	1,360,000

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

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

[2]Includes gold ore, lead ore, and silver ore.

TABLE 4
CONSUMPTION OF COPPER AND BRASS MATERIALS IN THE UNITED STATES, BY ITEM[1]

(Metric tons)

Item	Brass mills	Wire-rod mills	Foundries, chemical plants, miscellaneous users	Smelters, refiners, ingot makers	Total
2013:					
Copper scrap	697,000	W	64,500	140,000	902,000
Refined copper[2]	457,000	1,310,000	55,000	4,510	1,830,000
Hardeners and master alloys	10,100	--	4,810	--	14,900
Brass ingots	--	--	62,000 r	--	62,000 r
Slab zinc	24,000	--	(3)	(3)	24,900
2014:					
Copper scrap	737,000	W	59,400	139,000	936,000
Refined copper[2]	428,000	1,270,000	51,700	--	1,750,000
Hardeners and master alloys	10,100	--	5,450	--	15,600
Brass ingots	--	--	59,100	--	59,100
Slab zinc	10,300	--	751	--	11,100

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Brass mills." -- Zero.

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

[2]Detailed information on consumption of refined copper can be found in table 5.

[3]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[1]

(Metric tons)

Class of consumer	Cathodes	Ingots and ingot bars	Cakes and slabs	Wirebar, billets, other	Total
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[3]	W	W	W	36,200 r	36,200 r
Total	1,680,000	2,090	43,500	103,000	1,830,000
2014:					
Wire-rod mills	1,270,000	--	--	(2)	1,270,000
Brass mills	329,000	W	43,700	56,100	428,000
Chemical plants	W	W	--	231	231
Ingot makers	W	W	W	--	W
Foundries	13,200	2,180	W	9,980	25,400
Miscellaneous[3]	W	W	W	26,100	26,100
Total	1,620,000	2,180	43,700	92,500	1,750,000

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Wirebar, billets, other." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Withheld to avoid disclosing company proprietary data; included with "Cathodes."
[3]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[1]

(Metric tons)

	2013	2014
Kind of scrap:		
New:		
Copper-base	596,000	635,000
Aluminum-base	34,400 r	36,700
Nickel-base	18	18
Total	630,000	672,000
Old:		
Copper-base	136,000	140,000
Aluminum-base	30,600 r	32,400
Nickel-base	267	267
Zinc-base	--	10
Total	166,000	173,000
Grand total	797,000	845,000
Form of recovery:		
As unalloyed copper	48,100	53,400
In brass and bronze	678,000	720,000
In alloy iron and steel	682	2,240
In aluminum alloys	65,000 r	67,700
In chemical compounds	5,030	1,810
Total	797,000	845,000

rRevised. -- Zero.
[1]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[1]

(Metric tons)

Type of operation	From new scrap		From old scrap		Total	
	2013	2014	2013	2014	2013	2014
Ingot makers	13,600	15,900	59,600	57,700	73,100	43,600
Refineries[2]	17,500	17,000	29,400	29,000	46,900	46,000
Brass and wire-rod mills	531,000	563,000	35,500	43,000	567,000	606,000
Foundries and manufacturers	28,800	37,600	11,100	10,800	39,900	48,400
Chemical plants	5,030	1,800	--	--	5,030	1,800
Total	596,000	635,000	136,000	140,000	732,000	776,000

-- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]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[1]

(Metric tons)

Item produced from scrap	2013	2014
Unalloyed copper products:		
Refined copper	46,900	46,000
Copper powder	1,020	7,060
Copper castings	124	347
Total	48,100	53,400
Alloyed copper products:		
Brass and bronze ingots:		
Tin bronzes	6,230	6,230
Leaded red brass and semired brass	37,600 r	37,800
High leaded tin bronze	5,100	5,100
Yellow brass	4,820	4,820
Manganese bronze	6,260	6,260
Aluminum bronze	5,170	5,130
Nickel silver	1,020	1,030
Silicon bronze and brass	4,390	4,390
Copper-base hardeners and master alloys	5,250	5,900
Miscellaneous	6,090	6,090
Total	81,900 r	82,800
Brass mill and wire-rod mill products	677,000 r	727,000
Brass and bronze castings	38,500	40,600
Copper in chemical products	5,030	1,800
Grand total	851,000 r	905,000

rRevised.
[1]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[1]

(Metric tons)

	Copper	Tin	Lead	Zinc	Nickel	Aluminum	Total
Brass and bronze ingot production:[2]							
2013	65,200 [r]	3,170 [r]	4,620 [r]	8,830 [r]	111	11	81,900 [r]
2014	65,000	3,600	5,100	8,940	107	11	82,800
Secondary metal content of brass mill products:							
2013	559,000 [r]	1,240	2,310	114,000 [r]	1,050 [r]	16	677,000 [r]
2014	606,000	1,090	2,350	116,000	1,210	16	727,000
Secondary metal content of brass and bronze castings:							
2013	35,600	1,070	548	1,150	77	101	38,500
2014	37,700	1,070	542	1,120	75	89	40,600

[r]Revised.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes approximately 96% from scrap and 4% from other than scrap.

TABLE 10
CONSUMPTION AND YEAREND STOCKS OF COPPER-BASE SCRAP[1]

(Metric tons, gross weight)

Scrap type and processor	2013		2014	
	Consumption	Stocks	Consumption	Stocks
Unalloyed scrap:				
No.1 wire and heavy:				
Smelters, refiners, and ingot makers	18,400	860	18,100	813
Brass and wire-rod mills	288,000	(2)	361,000	(2)
Foundries and miscellaneous manufacturers	19,900	(2)	19,400	(2)
No. 2 mixed heavy and light:				
Smelters, refiners, and ingot makers	61,500	1,830	61,100	2,080
Brass and wire-rod mills	44,400	(2)	12,200	(2)
Foundries and miscellaneous manufacturers	6,100	(2)	15,700	(2)
Total unalloyed scrap:				
Smelters, refiners, and ingot makers	79,900	2,690	79,200	2,890
Brass and wire-rod mills	332,000	1,930	373,000	2,520
Foundries and miscellaneous manufacturers	26,000	2,130	35,100	3,020
Alloyed scrap:				
Red brass:[3]				
Smelters, refiners, and ingot makers	14,900	1,590	14,900	1,560
Brass mills	10,700	(2)	12,500	(2)
Foundries and miscellaneous manufacturers	2,320	(2)	2,400	(2)
Leaded yellow brass:				
Smelters, refiners, and ingot makers	8,970	816	8,970	836
Brass mills	118,000	(2)	120,000	(2)
Foundries and miscellaneous manufacturers	642	(2)	541	(2)
Yellow and low brass, all plants	135,000	879	135,000	(2)
Cartridge cases and brass, all plants	96,400	(2)	93,300	(2)
Auto radiators:				
Smelters, refiners, and ingot makers	15,600	653	15,600	710
Foundries and miscellaneous manufacturers	1,900	(2)	1,900	(2)
Bronzes:				
Smelters, refiners, and ingot makers	9,330	613	9,310	558
Brass mills and miscellaneous manufacturers	15,300	(2)	12,000	(2)
Nickel-copper alloys, all plants	9,540	138	10,400	98
Low grade and residues; smelters, refiners, miscellaneous manufacturers	22,900	609	8,890	628
Other alloy scrap:[4]				
Smelters, refiners, and ingot makers	1,010	352	1,010	352
Brass mills and miscellaneous manufacturers	5,510	(2)	5,330	(2)
Total alloyed scrap:				
Smelters, refiners, and ingot makers	60,200	5,400	60,100	5,390
Brass mills	369,000	1,340	368,000	1,960
Foundries and miscellaneous manufacturers	38,500	1,960	24,200	1,780
Total scrap:				
Smelters, refiners, and ingot makers	140,000	8,090	139,000	8,280
Brass and wire-rod mills	701,000	3,270	740,000	4,480
Foundries and miscellaneous manufacturers	64,500	4,090	59,400	4,800

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Individual breakdown is not available; included in "Total unalloyed scrap" or "Total alloyed scrap" and "Total scrap."
[3]Includes cocks and faucets, commercial bronze, composition turnings, gilding metal, railroad car boxes, and silicon bronze.
[4]Includes aluminum bronze, beryllium copper, and refinery brass.

TABLE 11
CONSUMPTION OF PURCHASED COPPER-BASE SCRAP[1, 2]

(Metric tons, gross weight)

Type of operation	New scrap		Old scrap		Total	
	2013	2014	2013	2014	2013	2014
Ingot makers	20,900 r	23,900	69,300 r	65,700	90,100 r	89,600
Smelters and refineries	18,300	18,300	31,600	31,500	49,900	49,700
Brass and wire-rod mills	664,000	696,000	36,600	44,400	701,000	740,000
Foundries and miscellaneous manufacturers	52,300 r	47,400	12,200 r	12,000	64,500 r	59,400
Total	756,000 r	786,000	150,000 r	154,000	906,000 r	939,000

rRevised.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]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[1]

(Metric tons)

Ingot type or material consumed	2013	2014
Brass ingot:		
Tin bronzes	6,650	6,620
Leaded red brass and semired brass	32,400	26,300
Yellow, leaded, low brass[2]	9,830 r	10,900
Manganese bronze	2,670	2,390
Nickel silver[3]	3,570 r	4,590
Aluminum bronze	3,760	4,560
Hardeners and master alloys[4]	4,810	5,450
Lead free alloys[5]	3,160	3,810
Total	66,800 r	64,600
Refined copper	54,900 r	51,700
Copper scrap	64,500	59,400

rRevised.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes brass and silicon bronze.
[3]Includes brass, copper nickel, and nickel bronze.
[4]Includes special alloys.
[5]Includes copper-bismuth and copper-bismuth-selenium alloys.

TABLE 13
AVERAGE PRICES FOR COPPER SCRAP, BY TYPE

(Cents per pound)

			Dealers' buying (New York)	
Year	Brass mills No. 1 scrap	Refiners' No. 2 scrap	No. 2 scrap	Red brass turnings and borings
2013	330.25	306.25	274.95	188.32
2014	307.75	283.44	263.33	183.01

Source: American Metal Market.

TABLE 14
U.S. EXPORTS OF UNMANUFACTURED COPPER (COPPER CONTENT), BY COUNTRY[1]

	Ore and concentrate		Matte, ash, and precipitates		Blister and anodes		Refined		Unalloyed copper scrap		Total	
Country	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2013	348,000	$2,330,000	31,200	$41,200	11,200	$66,500	111,000 r	$800,000 r	449,000	$2,220,000	953,000	$5,480,000
2014:												
Belgium	--	--	51	137	--	--	--	--	11,900	49,800	11,900	49,900
Canada	9,790	63,000	21,600	34,100	4,250	11,200	19,900	141,000	26,800	182,000	82,500	432,000
China	93,600	585,000	46	263	168	878	57,000	380,000	276,000	1,120,000	427,000	2,090,000
Germany	8	58	9	10	421	3,190	99	407	44,900	215,000	45,400	219,000
Hong Kong	2	18	--	--	1,350	10,300	12	103	5,480	17,600	6,840	28,000
India	29	142	--	--	1,350	10,300	996	2,620	3,220	12,900	4,600	23,400
Japan	17,400	111,000	115	83	281	2,140	2,270	5,250	6,910	31,400	27,000	150,000
Korea, Republic of	68	379	--	--	1,050	7,810	529	2,180	14,100	92,300	15,700	103,000
Mexico	287,000	2,180,000	--	--	79	619	42,400	302,000	708	3,740	330,000	2,480,000
Philippines	1,910	13,300	--	--	60	400	1	11	1	5,200	1,970	18,900
Spain	--	--	--	--	122	932	15	90	1,550	5,820	1,680	6,840
Other	403	3,550	322	151	2,730	11,500	4,530	21,600	38,400	193,000	46,800	235,000
Total	410,000	2,950,000	22,200	34,800	11,800	59,200	127,000	854,000	430,000	1,930,000	1,000,000	5,840,000

rRevised. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 15

U.S. EXPORTS OF COPPER SEMIMANUFACTURES, BY COUNTRY[1]

Country	Pipes and tubing		Plates, sheets, foil, bars		Bare wire, including wire rod[2]		Wire and cable, stranded		Copper sulfate	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2013	17,100	$171,000	26,200	$305,000	162,000	$1,190,000	43,100	$408,000	7,830	$23,400
2014:										
Bahamas, The	--	--	5	61	2	41	219	2,040	--	--
Belgium	(3)	3	5	135	371	1,280	127	7,670	8	139
Canada	3,460	32,100	7,230	64,600	33,400	238,000	14,600	120,000	3,770	9,110
China	276	2,310	692	23,300	11,000	61,700	94	1,860	523	2,180
Colombia	158	740	48	412	72	713	32	395	--	--
Costa Rica	--	--	27	143	26	449	301	1,940	--	--
Dominican Republic	33	325	1	19	127	896	33	364	40	92
Germany	100	469	261	3,780	41	320	81	2,730	5	9
Hong Kong	25	186	1,050	11,700	137	1,250	14	571	(3)	4
India	9	156	16	218	68	917	24	711	8	34
Israel	(3)	16	26	330	64	325	53	1,400	208	1,420
Japan	17	80	435	6,000	222	1,040	48	1,220	14	340
Korea, Republic of	63	1,010	339	3,000	714	6,050	13	699	112	1,090
Malaysia	18	314	269	5,470	--	--	32	763	393	601
Mexico	4,760	46,500	14,700	146,000	107,000	793,000	28,200	250,000	39	69
Netherlands	44	326	19	192	70	311	93	1,090	--	--
Saudi Arabia	2,650	24,200	6	94	1	15	195	1,560	--	--
Singapore	38	419	74	1,000	277	2,240	22	499	53	789
Taiwan	8	96	146	1,900	41	440	3	119	376	5,780
Trinidad and Tobago	11	53	9	107	740	3,480	32	389	--	--
United Arab Emirates	1,220	10,800	16	92	11	126	20	288	--	--
United Kingdom	22	365	171	1,890	48	333	31	863	8	50
Other	1,020	10,600	821	8,200	799	7,720	1,450	29,100	732	3,040
Total	13,900	131,000	26,300	279,000	155,000	1,120,000	45,800	426,000	6,290	24,700

-- Zero.

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

[2]Total exports of wire rod in 2013 were 130,000 metric tons (t) valued at $998 million, and in 2014, wire rod exports were 134,000 t valued at $980 million.

[3]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 16
U.S. IMPORTS FOR CONSUMPTION OF UNMANUFACTURED COPPER (COPPER CONTENT), BY COUNTRY[1]

	Ore and concentrate		Matte, ash, and precipitates		Blister and anode		Refined		Unalloyed scrap		Total	
Country	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)
2013	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
2014:												
Brazil	--	--	--	--	--	--	--	--	40	188	40	188
Canada	19	77	194	996	1	38	194,000	1,360,000	14,900	83,400	209,000	1,450,000
Chile	6	13	--	--	--	--	315,000	2,200,000	17	78	315,000	2,210,000
Congo (Kinshasa)	--	--	--	--	--	--	14,500	96,500	--	--	465	3,230
Costa Rica	--	--	--	--	--	--	--	--	522	3,140	522	3,140
Dominican Republic	--	--	--	--	--	--	--	--	110	648	110	648
Germany	--	--	--	--	3	46	3,200	24,200	178	132	3,380	24,800
Japan	--	--	6	28	4	357	4,830	42,000	5	71	4,850	44,000
Mexico	22	432	95	246	--	--	84,000	571,000	11,700	61,500	95,800	636,000
Nicaragua	--	--	--	--	--	--	--	--	81	472	81	472
Peru	--	--	--	--	--	--	551	3,680	425	1,870	976	5,590
Other	53	57	765	3,910	495	4,740	4,610	32,300	3,000	14,600	22,900	154,000
Total	100	579	1,060	5,180	503	5,180	620,000	4,330,000	31,000	166,000	653,000	4,530,000

-- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Cost, insurance, freight value at U.S. port.

Source: U.S. Census Bureau.

TABLE 17
U.S. IMPORTS FOR CONSUMPTION OF COPPER SEMIMANUFACTURES, BY COUNTRY[1]

Country	Pipes and tubing		Plates, sheets, foil, bars		Bare wire, including wire rod[2]		Wire and cable, stranded		Copper sulfate	
	Quantity (metric tons)	Value[3] (thousands)	Quantity (metric tons)	Value[3] (thousands)	Quantity (metric tons)	Value[3] (thousands)	Quantity (metric tons)	Value[3] (thousands)	Quantity (metric tons)	Value[3] (thousands)
2013	455	$5,410	53,200	$562,000	137,000	$1,050,000	15,300	$132,000	36,100	$87,600
2014:										
Brazil	54	445	1,910	15,100	1	11	1	16	--	--
Canada	81	2,100	470	5,000	127,000	927,000	692	5,690	3,550	8,440
Chile	--	--	3,800	28,300	--	--	--	--	386	978
China	54	481	2,450	23,200	388	4,270	74	1,130	371	991
Finland	4	66	4,100	39,100	777	7,190	--	--	--	--
France	14	250	952	8,290	--	--	27	1,440	29	105
Germany	25	374	21,800	203,000	368	3,120	30	1,180	12	36
Hong Kong	--	--	30	167	14	165	1	28	--	--
India	5	60	204	2,180	(4)	6	55	1,450	6	31
Israel	--	--	--	--	287	2,990	--	--	--	--
Italy	2	50	39	478	--	--	44	988	--	--
Japan	77	615	2,580	70,100	61	665	--	--	303	350
Korea, Republic of	840	5,020	1,140	13,800	122	1,200	27	103	36	189
Luxembourg	--	--	1,170	16,400	--	--	--	--	--	--
Mexico	100	1,320	3,850	30,600	13,800	96,500	310	2,040	28,300	68,900
Peru	--	--	9,320	72,100	22	178	--	--	123	295
Russia	--	--	--	--	--	--	--	--	4,120	11,100
Sweden	--	--	34	361	148	1,420	--	--	--	--
Taiwan	--	--	337	2,630	--	--	13	276	3,340	8,480
Thailand	--	--	194	1,800	--	--	88	785	--	--
Turkey	--	--	3	30	--	--	12,400	99,900	--	--
United Kingdom	(4)	7	218	2,350	1	10	1	53	--	--
Other	103	444	2,900	24,300	143	1,350	161	2,090	1	14
Total	1,310	11,200	57,500	559,000	143,000	1,050,000	13,900	117,000	40,500	99,900

-- Zero.

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

[2]Total imports of wire rod in 2013 were 137,000 metric tons (t) valued at $1,040 million, and in 2014, wire rod imports were 143,000 t valued at $1,040 million.

[3]Cost, insurance, freight value at U.S. port.

[4]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 18
U.S. EXPORTS OF COPPER SCRAP, BY COUNTRY[1]

	Unalloyed copper scrap				Copper-alloy scrap			
	2013		2014		2013		2014	
Country	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Belgium	18,400	$111,000	11,900	$49,800	10,900	$37,300	9,440	$30,000
Canada	20,900	156,000	26,800	182,000	36,500	140,000	37,600	136,000
China	320,000	1,450,000	276,000	1,120,000	523,000	1,310,000	451,000	984,000
Germany	28,800	174,000	44,900	215,000	8,440	30,000	11700	48,200
Hong Kong	8,160	26,100	5,480	17,600	48,800	111,000	28,400	49,300
India	873	4,470	3,220	12,900	8,280	22,300	16,900	51,700
Japan	4,080	21,800	6,910	31,400	14,000	58,000	12,900	63,500
Korea, Republic of	10,600	71,700	14,100	92,300	12,000	45,600	17,100	86,500
Mexico	1,780	11,700	708	3,740	3,580	20,000	3,420	19,600
Spain	3,550	14,200	1,550	5,820	8,720	26,500	11,800	28,200
Taiwan	4,740	26,900	5,830	22,400	7,680	11,700	5,340	15,700
Other	26,800 r	153,000	32,500	175,000	24,100	40,800	11,400	36,100
Total	449,000 r	2,220,000	430,000	1,930,000	706,000	1,850,000	616,000	1,550,000

rRevised.
[1]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[1]

Country or territory	Unalloyed copper scrap		Copper-alloy scrap		
	Quantity (metric tons)	Value[2] (thousands)	Gross weight (metric tons)	Copper content[3] (metric tons)	Value[2] (thousands)
2013	29,100	$163,000	77,300	55,600	$362,000
2014:					
Bahamas, The	105	368	297	214	873
Brazil	40	188	104	75	356
Canada	14,900	83,400	41,100	29,600	215,000
China	334	1,230	577	416	3,220
Colombia	316	1,370	545	393	2,310
Costa Rica	522	3,140	1,920	1,380	9,350
Dominican Republic	110	648	729	525	2,030
Ecuador	55	296	416	299	2,230
El Salvador	12	23	1,170	843	4,340
Guatemala	82	297	1,960	1,410	9,730
Honduras	144	844	764	550	3,270
Mexico	11,700	61,500	32,300	23,200	130,000
Nicaragua	81	472	887	639	4,600
Panama	426	2,750	208	150	909
Philippines	--	--	385	277	2,060
Saudi Arabia	149	661	27	20	233
Suriname	511	3,250	117	84	447
Trinidad and Tobago	20	53	56	40	246
United Arab Emirates	17	72	16	12	95
Other	1,460	5,570	2,100	1,510	9,450
Total	31,000	166,000	85,600	61,600	401,000

-- Zero.

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

[2]Cost, insurance, freight value at U.S. port.

[3]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[1, 2]

(Metric tons)

Country	2010	2011	2012	2013	2014
Albania[e]	3,000 [r]	4,860 [r]	5,690 [r]	5,090 [r]	3,500
Argentina	140,300 [r]	116,700 [r]	136,000	109,600 [r]	102,600
Armenia[e]	31,062 [3]	33,597 [3]	41,200 [r]	42,000	48,000
Australia:[e]					
Concentrates	856,000	922,300 [3]	876,000 [r]	966,000 [r]	930,000
Leaching, electrowon	14,400	35,600	38,000 [r]	35,000 [r]	40,000
Total	870,000	958,000	914,000 [r]	1,000,000 [r]	970,000
Azerbaijan	184	611	502	330 [r]	780
Bolivia:					
Concentrates	--	1,900	5,400	5,000 [r]	8,900
Leaching, electrowon	880	1,000	900	1,300 [r]	1,800
Total	880	2,900	6,300	6,300 [r]	10,700
Botswana[e]	32,000 [r]	30,000 [r]	40,000 [r]	54,000 [r]	58,000
Brazil:					
Concentrates	213,548	213,760	223,141	271,000	294,000 [e]
Leaching, electrowon	4,497	4,550	4,374	4,060 [r]	2,000 [e]
Total	218,045	218,310	227,515	275,060 [r]	296,000 [e]
Bulgaria[e]	105,000	105,000	107,900	110,000	110,000
Burma, leaching, electrowon[e]	9,000	9,000	19,000	25,000 [r]	33,200
Canada:					
Concentrates	522,200	568,800	578,600	631,900	695,500
Leaching, electrowon	800	1,000	900	--	--
Total	523,000	569,800	579,500	631,900	695,500
Chile:[3]					
Concentrates	3,330,400	3,238,000	3,405,100	3,843,100	3,887,800
Leaching, electrowon	2,088,500	2,024,800	2,028,800	1,932,900	1,861,800
Total	5,418,900	5,262,800	5,433,900	5,776,000	5,749,600
China:[e]					
Concentrates	1,160,000	1,270,000	1,550,000	1,560,000	1,720,000
Leaching, electrowon	35,000	35,000	30,000	40,000	40,000
Total	1,200,000	1,310,000	1,580,000	1,600,000	1,760,000
Colombia	861	890	750	640	4,100
Congo (Kinshasa):[e, 4]					
Concentrates	159,000	168,000 [r]	187,000 [r]	280,000	140,000
Leaching, electrowon	261,000	362,000 [r]	473,000 [r]	690,000	890,000
Total	420,000	530,000	660,000	970,000	1,030,000
Cyprus, leaching, electrowon	2,595	3,660	4,328	3,631	3,090
Dominican Republic	10,015	11,777	11,737	10,379	9,260
Finland	14,700	14,000	25,500	38,800	42,800
Georgia[e]	6,700	6,300	7,400	5,000	6,000
India[e]	35,500	37,700	34,000	36,100	25,000
Indonesia:					
Concentrates[e]	876,984 [3]	534,000	394,000	504,000	373,000
Leaching, electrowon	1,392	900 [e]	--	--	1,400
Total[e]	878,376 [3]	535,000	394,000	504,000	374,000
Iran:[e]					
Concentrates	249,000	249,000	233,000	209,000	205,000
Leaching, electrowon	7,000	10,100	12,000	14,000	15,000
Total	256,000	259,000	245,000	223,000	220,000
Kazakhstan:					
Concentrates	427,000	405,300	419,200	440,000	460,000
Leaching, electrowon	--	--	7,000 [e]	12,200	12,400 [e]
Total	427,000	405,300	426,000 [e]	452,200	472,000 [e]
Korea, North[e]	12,000	12,000	16,000	17,000	19,300

See footnotes at end of table.

TABLE 20—Continued
COPPER: WORLD MINE PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country	2010	2011	2012	2013	2014
Laos:					
Concentrates	67,806	59,897	63,285	64,900 r	71,200
Leaching, electrowon	64,241	78,860 r	86,295	90,000	88,500
Total	132,047	138,757 r	149,580	154,900 r	159,700
Macedonia:[e]					
Concentrates	7,500 r	7,200 r	9,100 r	9,200	7,800
Leaching, electrowon	--	--	1,100	1,900	2,000
Total	7,500 r	7,200 r	10,200 r	11,100	9,800
Mauritania	36,969	35,281	37,670	37,970	33,100
Mexico:[e]					
Concentrates	184,000 r	297,000 r	342,000 r	317,000	327,000
Leaching, electrowon	86,000 r	147,000 r	158,000 r	163,000	188,000
Total	270,000	444,000	500,000	480,000	515,000
Mongolia:					
Concentrates	125,000	121,600	121,700	186,700	249,000
Leaching, electrowon	2,700	2,400	2,100	2,100	2,100 e
Total	127,700	124,000	123,800	188,800	251,000 e
Morocco	16,000	12,900	17,700	18,000 e	18,000 e
Namibia	--	3,370 r	5,300 r	4,900 r	5,250
Oman[e]	2,000	2,000	2,000	2,000	2,000
Pakistan[e]	19,300 r	18,800 r	19,200 r	13,500 r	13,100
Papua New Guinea	159,800	130,500 r	125,300 r	105,500 r	75,900
Peru:					
Concentrates	1,094,123	1,094,971	1,197,569	1,285,983	1,295,800
Leaching, electrowon	153,022	140,341	101,174	89,658	83,800
Total	1,247,145	1,235,312	1,298,743	1,375,641	1,379,600
Philippines	58,412	63,835	65,444	90,861	91,900
Poland	425,400	426,700	427,100 r	428,900 r	421,300
Portugal	74,426	79,686	74,043	77,236	75,400
Romania[e]	5,000	6,500	6,300	6,800	7,000
Russia:[e]					
Concentrates	699,500 [3]	710,400 [3]	718,000	720,000 r	740,000
Leaching, electrowon	3,200	2,700	2,000	2,000	2,000
Total	703,000	713,000	720,000	722,000 r	742,000
Saudi Arabia[e]	1,603 [3]	1,620	6,000	9,900 r	10,000
Serbia	24,600	28,000	34,400	36,500	36,500
South Africa	102,600	96,600	81,000	76,500 r	87,600
Spain:					
Concentrates	22,300	33,000	32,200	26,100	34,800
Leaching, electrowon	28,500	42,100	67,700	69,300	71,100
Total	50,800	75,100	99,900	95,400	105,900
Sweden	76,000 r	82,200 r	82,500 r	83,000 r	79,900
Tanzania, in concentrates and dore	6,392	6,748	5,600 r	5,800 r	5,800
Turkey[e]	88,000	80,000	104,000	120,000	122,000
United States:[4]					
Concentrates	679,000	666,000	696,000	774,000	843,000
Leaching, electrowon	430,000	447,000	471,000	475,000	514,000
Total	1,110,000	1,110,000	1,170,000	1,250,000	1,360,000
Uzbekistan[e]	90,000	91,500 [3]	95,600	97,000	100,000
Vietnam[e]	12,300 r	11,300	11,300	12,300 r	12,000
Zambia:[e]					
Concentrates	527,000 r	521,000 r	517,000 r	559,000	520,000
Leaching, electrowon	145,000 r	142,000 r	178,000 r	201,000	188,000
Total	672,000 r	663,000 r	695,000 r	760,000	708,000

See footnotes at end of table.

TABLE 20—Continued
COPPER: WORLD MINE PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country	2010	2011	2012	2013	2014
Zimbabwe, concentrates[e]	4,700	6,000	6,300	8,300 [r]	8,300
Grand total	16,100,000	16,100,000	16,900,000	18,200,000 [r]	18,500,000
Of which:					
Concentrates	12,800,000	12,600,000 [r]	13,200,000	14,300,000 [r]	14,400,000
Leaching, electrowon	3,340,000 [r]	3,490,000 [r]	3,690,000	3,850,000 [r]	4,040,000

[e]Estimated. [r]Revised. -- Zero.

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

[2]Table represents copper content of concentrates produced (includes cement copper, if applicable), except where otherwise noted. Includes data available through May 9, 2016.

[3]Reported figure.

[4]Recoverable content.

TABLE 21
COPPER: WORLD SMELTER PRODUCTION, BY COUNTRY[1, 2]

(Metric tons, gross weight)

Country	2010	2011	2012	2013	2014
Armenia, primary	7,644	8,876	10,075	10,771	9,810
Australia, primary	410,000	442,000	422,000	446,000	468,000
Austria, secondary[e]	80,000 [r]	70,000 [r]	70,000 [r]	60,000 [r]	60,000
Belgium, secondary	118,600	112,900	118,600	150,600	143,000
Botswana, primary[3]	22,750	16,100	17,625	21,300 [r]	14,600
Brazil:					
Primary	222,300	222,550	186,000	200,000 [e]	188,000
Secondary[e]	23,000	22,800	24,700	26,000	25,000
Total[e]	245,000	245,000	211,000	226,000	213,000
Bulgaria:					
Primary	229,900	256,300	264,200	294,000 [r]	305,000
Secondary[e]	38,800	82,000	46,300	60,000 [r]	55,000
Total[e]	269,000	338,000	311,000	354,000 [r]	360,000
Canada:					
Primary	318,006	304,724	287,051	254,000	289,000
Secondary	31,815	25,214	23,362	29,000	32,000
Total	349,821	329,938	310,413	283,000	321,000
Chile, primary	1,559,800	1,522,300	1,342,400	1,358,300	1,356,200
China:[e]					
Primary	2,800,000	3,030,000	3,200,000	4,000,000	4,600,000
Secondary	1,300,000	1,600,000	1,800,000	2,000,000	1,900,000
Total	4,100,000	4,630,000	5,000,000	6,000,000	6,500,000
Finland:[e]					
Primary	149,000	156,000	175,000	175,000	175,000
Secondary	2,000	2,000	2,000	2,000	2,000
Total	151,000	158,000	177,000	177,000	177,000
Germany:					
Primary	378,700	335,000	352,400	295,200	351,100
Secondary	206,000	212,000	182,000	168,600	173,400
Total	584,700	547,000	534,400	463,800	524,500
India:					
Primary	748,800	670,000	680,000	690,000	750,000
Secondary[e]	9,000	-- [r]	-- [r]	-- [r]	--
Total[e]	758,000	670,000 [r]	680,000 [r]	690,000 [r]	750,000
Indonesia, primary	262,700	276,200	198,400	217,700	236,900
Iran:[e]					
Primary	190,000	185,000	180,000	155,000	155,000
Secondary	91,000	85,000	90,000	70,000	75,000
Total	281,000	270,000	270,000	225,000	230,000
Japan:					
Primary	1,382,700	1,168,284	1,304,900	1,249,300	1,290,000
Secondary	260,200	269,748	303,900	313,600	310,000
Total	1,642,900	1,438,032	1,608,800	1,562,900	1,600,000
Kazakhstan, undifferentiated	319,000 [r]	303,000 [r]	302,000 [r]	269,000 [r]	212,500
Korea, North, undifferentiated[e]	12,000	12,000	12,000	12,000	12,000
Korea, Republic of:					
Primary	457,900	449,200	477,300	478,800	500,000
Secondary[e]	65,200	89,800	144,500 [4]	125,100 [4]	120,000
Total[e]	523,000	539,000	622,000 [r]	604,000 [r]	620,000
Mexico:					
Primary	118,500	233,800	255,900	215,000	253,000
Secondary[e]	5,000	5,000	5,000	5,000	5,000
Total[e]	124,000	239,000	261,000	220,000	258,000

See footnotes at end of table.

TABLE 21—Continued
COPPER: WORLD SMELTER PRODUCTION, BY COUNTRY[1, 2]

(Metric tons, gross weight)

Country	2010	2011	2012	2013	2014
Namibia, primary[e]	31,900	43,800	39,800	38,100	49,600
Oman, primary[e]	9,000	12,000	12,000	12,000	12,000
Pakistan, primary	18,800 [r]	18,000 [r]	19,200 [r]	13,500 [r]	13,100
Peru, primary	312,968	299,004	290,088	320,000	314,600
Philippines, primary	216,200	205,000	97,000	181,900	153,000
Poland:					
Primary	469,700 [r]	481,900 [r]	466,700 [r]	458,800 [r]	475,000 [e]
Secondary	78,400 [r]	68,200 [r]	82,300 [r]	78,000 [r]	80,000 [e]
Total	548,100 [r]	550,100 [r]	549,000 [r]	536,800 [r]	555,000 [e]
Russia:[e]					
Primary	590,000	596,490 [4]	621,000 [r]	625,000	650,000
Secondary	240,000	242,640 [4]	254,000 [r]	255,000	230,000
Total	830,000	839,130 [4]	875,000	880,000	880,000
Serbia:[e]					
Primary	23,000	27,000	33,000	33,000	33,000
Secondary	1,000	1,000	1,000	1,000	1,000
Total	24,000	28,000	34,000	34,000	34,000
Slovakia, secondary	46,500	48,800	41,700	18,500	23,300
South Africa, primary	75,900	82,400	62,300	69,700	71,800
Spain:[e]					
Primary	236,000	231,000 [r]	270,000	212,000	284,100
Secondary	19,000	21,700	25,000	14,000	10,000
Total	255,000	253,000 [r]	295,000	226,000	294,000
Sweden:					
Primary	142,000	162,000	151,000	140,000	150,000
Secondary[e]	40,000	45,000	56,000	59,000	60,000
Total[e]	182,000	207,000	207,000	199,000	210,000
Turkey, undifferentiated[e, 5]	25,000	25,000	25,000	31,500	35,000
United States, primary	601,000	538,000	485,000	516,000	522,000
Uzbekistan, undifferentiated[e]	92,000	92,000	96,000 [r]	98,000 [r]	100,000
Vietnam, primary[e]	8,000	8,000	8,000	8,000	8,000
Zambia, primary	535,000 [r]	520,000 [r]	519,000 [r]	520,000 [r]	526,000
Grand total	15,600,000	15,900,000	16,100,000 [r]	17,100,000	17,900,000
Of which:					
Primary	12,500,000 [r]	12,500,000	12,400,000	13,200,000	14,200,000
Secondary	2,660,000 [r]	3,000,000 [r]	3,270,000 [r]	3,440,000 [r]	3,300,000
Undifferentiated	448,000 [r]	432,000 [r]	435,000 [r]	411,000 [r]	360,000

[e]Estimated. [r]Revised. -- Zero.

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

[2]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 May 10, 2016.

[3]Copper content of nickel-copper matte exported to Norway for refining.

[4]Reported figure.

[5]Secondary production is estimated to be about one-third of total.

TABLE 22
COPPER: WORLD REFINERY PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country[3]	2010	2011	2012	2013	2014
Argentina, secondary[e]	16,000	13,000 [r]	13,000 [r]	14,000 [r]	14,000
Australia, primary:					
Electrowon	14,400	35,600	38,000 [r]	35,000 [r]	40,000
Other	409,600 [r]	441,400 [r]	422,000 [r]	446,000 [r]	469,000
Total	424,000 [r]	477,000 [r]	460,000	481,000 [r]	509,000
Austria, secondary	113,700	112,500	113,600	90,000 [r]	90,000
Belgium:					
Primary	216,000	226,200	217,900	202,500	225,000
Secondary	165,000	168,000	178,800	186,900	160,000
Total	381,000	394,200	396,700	389,400	385,000
Bolivia, primary, electrowon	880	1,000	900	1,300 [r]	1,800
Brazil:					
Primary:					
Electrowon	4,497	4,550	4,374	4,060 [r]	2,000 [e]
Other	217,800	218,000	182,000	230,000	213,000 [e]
Total	222,297	222,550	186,374	234,060 [r]	215,000 [e]
Secondary	23,000	22,800	24,700	27,800	25,000 [e]
Total, primary and secondary	245,297	245,350	211,074	261,860 [r]	240,000 [e]
Bulgaria:					
Primary	195,400	201,100	201,000	204,000 [r]	209,000
Secondary[e]	19,600	25,000	25,000	25,000 [r]	25,000
Total[e]	215,000	226,000	226,000	229,000 [r]	234,000
Burma, primary, electrowon[e]	9,000	9,000	19,000	20,000	33,200
Canada:					
Primary:					
Electrowon	800	1,000	900	--	--
Other	290,000	244,000	246,000	292,200	295,000
Total	290,800	245,000	246,900	292,200	295,000
Secondary[e]	30,000	30,000	30,000	30,000	30,000
Total, primary and secondary[e]	321,000	275,000	277,000	322,000	325,000
Chile, primary:					
Electrowon	2,088,500	2,024,800	2,028,800	1,932,900	1,861,800
Other	1,155,400	1,067,600	873,200	822,000	885,400
Total	3,243,900	3,092,400	2,902,000	2,754,900	2,747,200
China:[e]					
Primary:					
Electrowon	35,000 [r]	35,000 [r]	30,000	40,000	40,000
Other	2,950,000	3,390,000	3,930,000	4,300,000	4,860,000
Total	2,990,000 [r]	3,430,000 [r]	3,960,000	4,340,000	4,900,000
Secondary	1,700,000	1,850,000	1,950,000	2,200,000	2,300,000
Total, primary and secondary	4,690,000 [r]	5,280,000 [r]	5,910,000	6,540,000	7,200,000
Congo (Kinshasa), primary, electrowon[e]	261,000 [r]	362,000	473,000 [r]	690,000	890,000
Cyprus, primary, electrowon	2,595	3,660	4,328	3,631	3,090
Egypt, secondary[e]	3,000	3,000	3,000	3,000	3,000
Finland:[e]					
Primary	109,000	117,000	120,000	120,000	130,000
Secondary	4,000	9,000	9,000	9,000	10,000
Total	113,000	126,000	129,000	129,000	140,000
Germany:					
Primary	401,900	401,200	390,000	390,000	391,900
Secondary	302,400	308,000	295,700	287,600	285,000
Total	704,300	709,200	685,700 [r]	677,600	676,900
India:					
Primary, other, electrolytic	654,900	671,100	690,000	610,000	755,000
Secondary[e]	9,000	2,000	10,000	12,000	10,000
Total[e]	664,000	673,000	700,000	622,000	765,000

See footnotes at end of table.

TABLE 22—Continued
COPPER: WORLD REFINERY PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country[3]	2010	2011	2012	2013	2014
Indonesia, primary:					
Electrowon	1,392	900 e	--	--	1,400
Other	277,500	274,900	197,200	214,300	231,800
Total	278,892	276,000 e	197,200	214,300	233,200
Iran:					
Primary:[e]					
Electrowon	7,000	10,100 r	12,000 r	14,000	15,000
Other	143,000	149,000	136,000	121,000	120,000
Total	150,000	159,000	148,000 r	135,000	135,000
Secondary	70,000	68,000	78,000	56,000	60,000
Total, primary and secondary[e]	220,000	227,000	226,000 r	191,000	195,000
Italy, secondary[e]	2,000	2,000	2,000	2,000	2,000
Japan:					
Primary	1,333,787	1,094,360	1,270,900	1,210,200	1,294,000
Secondary	214,901	233,238	245,400	257,900	260,000 e
Total	1,548,688	1,327,598	1,516,300	1,468,100	1,554,000
Kazakstan, primary:					
Leaching, electrowon	--	--	7,000 e	12,200	12,400 e
Other	323,368	338,346	367,177	352,061	294,000
Total	323,368	338,346	374,000 e	364,261	306,000 e
Korea, North, primary[e]	12,000 r	12,000 r	12,000 r	12,000 r	12,000
Korea, Republic of:					
Primary	462,200	486,900	493,200	495,400	490,000
Secondary	97,000	106,600	96,200	109,800	110,000
Total	559,200	593,500	589,400	605,200	600,000
Laos, primary, electrowon	64,241	78,860 r	86,295	90,000	88,500
Macedonia, primary, electrowon	--	--	1,100	1,900	2,000
Mexico:[e]					
Primary:					
Electrowon	86,000 r	147,000 r	158,000 r	163,000	188,000
Other	157,000	251,000	215,000	188,000	204,000
Total	243,000 r	398,000 r	373,000 r	351,000	392,000
Secondary	5,000	5,000	5,000	5,000	5,000
Total, primary and secondary	248,000 r	403,000 r	378,000 r	356,000 r	397,000
Mongolia, primary, electrowon	2,700 r	2,400 r	2,100 r	2,100 r	2,100 e
Norway, primary[e, 4]	36,100 r	35,700 r	37,900 r	37,500 r	35,800
Oman, primary	15,000	16,000	16,000	16,000	16,000
Peru, primary:					
Electrowon	153,022	140,341	101,174	89,658	83,800
Other	240,616	227,320	210,119	271,792	263,600
Total	393,638	367,661	311,293	361,450	347,400
Philippines, primary	176,000	164,000	90,400	153,000	130,000
Poland:					
Primary	452,700	489,000	464,900	450,600	469,100
Secondary	94,300	81,900	99,400	114,500	107,800
Total	547,000	570,900	564,300	565,100	576,900
Russia:[e]					
Primary:					
Electrowon	3,200	2,700	2,000	2,000	2,000
Other	656,000	663,200	635,000	650,000	660,000
Total	659,000	666,000	637,000	652,000	662,000
Secondary	218,000	220,400	209,400	220,000	220,000
Total, primary and secondary	877,000	886,000	846,000	872,000	882,000

See footnotes at end of table.

TABLE 22—Continued
COPPER: WORLD REFINERY PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

Country[3]	2010	2011	2012	2013	2014
Serbia:					
Primary	21,240	25,251	32,229	32,606	32,500 e
Secondary	963	3,198	2,473	3,234	3,500 e
Total	22,203	28,449	34,702	35,840	36,000 e
South Africa, primary	81,129	86,166	66,416	80,821	80,000 e
Spain:					
Primary:					
Electrowon	28,500	42,100	67,700	69,300	71,100
Other	236,000	225,700	250,500	213,500	274,000
Total	264,500	267,800	318,200	282,800	345,100
Secondary	82,900	86,000	88,300	68,200	73,000
Total, primary and secondary	347,400	353,800	406,500	351,000	418,100
Sweden:[e]					
Primary	150,497 [5]	179,316 [5]	174,000	166,000	177,000
Secondary	40,000	40,000	40,000	40,000	40,000
Total	190,000	219,000	214,000	206,000	217,000
Taiwan, secondary[e]	4,500	4,500	4,500	4,500	4,500
Turkey:[e]					
Primary	42,300	81,500	81,300	72,000	65,000
Secondary	5,000	5,000	5,000	5,000	5,000
Total	47,300	86,500	86,300	77,000	70,000
Ukraine, secondary[e]	20,000	20,000	20,000	20,000	20,000
United States:					
Primary:					
Electrowon	430,000	447,000	471,000	475,000	514,000
Other	627,000	545,000	491,000	518,000	535,000
Total	1,060,000	992,000	962,000	993,000	1,050,000
Secondary	37,700	37,300	39,400	46,900	46,000
Total, primary and secondary	1,090,000	1,030,000	1,000,000	1,040,000	1,090,000
Uzbekistan, primary[e]	90,000	91,500	95,600 r	98,000 r	99,500
Vietnam, primary[e]	8,000	8,000	8,000	8,000	8,000
Zambia, primary:[e]					
Electrowon	158,000	147,000 r	186,000	241,000	220,000
Other	370,000	369,000 r	344,000 r	327,000	290,000
Total	528,000	516,000 r	530,000 r	568,000	510,000
Zimbabwe, primary[e]	4,545 [5]	4,355 [5]	5,000	5,000	5,000
Grand total	19,100,000	19,700,000	20,200,000	21,000,000	22,200,000
Of which:					
Primary:					
Electrowon	3,350,000	3,500,000 r	3,690,000 r	3,890,000 r	4,070,000
Other	12,500,000	12,800,000	13,000,000 r	13,300,000	14,200,000
Total	15,900,000	16,300,000	16,700,000	17,200,000	18,300,000
Secondary	3,280,000	3,460,000	3,590,000	3,840,000 r	3,910,000

[e]Estimated. [r]Revised. -- Zero.

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

[2]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 May 10, 2016.

[3]Thailand produced secondary copper, but available information is inadequate to make reliable estimates of output levels.

[4]May include secondary.

[5]Reported figure.