



# 2011 Minerals Yearbook

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After declining for 2 consecutive years, mine production of recoverable copper in the United States in 2011 remained essentially unchanged from that in 2010 at 1.11 million metric tons (Mt). Mine capacity increased by about 100,000 metric tons (t) from 2009 to 2011, but production in 2011 was about 70,000 t less than that in 2009. Similarly, despite announced expansions in global mine capacity of about 400,000 metric tons per year (t/yr) for the second consecutive year, lower capacity utilization in 2011 resulted in global copper mine production remaining essentially unchanged for the second consecutive year. Numerous factors, including labor and political unrest, selective mining of lower-grade ore, technical problems, and utility shortages, continued to sustain the downward trend in copper mine capacity utilization. According to data compiled by the International Copper Study Group (ICSG), global mine capacity utilization declined to about 79.0% in 2011 from about 80.5% in 2010 and 88.0% in 2006 (International Copper Study Group, 2012a, p. 9).

The United States remained the fourth-ranked mine producer of copper behind Chile, China, and Peru and accounted for about 7% of global production. Although production in Chile declined to its lowest level since 2003, it remained the leading world mined copper producer and accounted for 33% of global production, while China surpassed Peru to become the second-ranked producer. Global smelter production rose slightly in 2011, and downstream refinery production rose by about 3%, owing to across-the-board increases in primary electrolytic, electrowon, and secondary production. The United States fell to eighth ranked in copper smelter production from sixth in 2010, although production was essentially equal to seventh-ranked Republic of Korea and ninth-ranked Poland. The United States remained fourth in refined copper production behind China, Chile, and Japan.

According to data compiled by the ICSG (2012a, p. 19–20, 38), global consumption of refined copper in 2011 rose by 2.7% (500,000 t) to 19.9 Mt and was 9% more than the prerecession peak in 2008. While consumption in North America remained stagnant in 2011 and declined slightly in the European Union, consumption in Asia rose by 2.7%, principally owing to a 7% increase in China's apparent consumption, which accounted for about 40% of total global consumption. China's apparent consumption is based on reported production, trade, and Shanghai Futures Exchange (SHFE) stock data, and does not include unreported Government or industry stocks, which may fluctuate significantly on an annual basis.

According to ICSG estimates, for the second consecutive year, global consumption for refined copper was slightly higher (200,000 t) than global production of refined copper, although reported yearend inventories of refined copper remained unchanged at 1.2 Mt, about 6% of annual consumption of

19.9 Mt of refined copper. A decline in unreported inventories in China may in part account for the disparity between the production shortfall and reported stock changes. China's net imports of refined copper declined by about 200,000 t to 2.68 Mt owing to an equally divided decrease in imports and increase in exports (International Copper Study Group, 2012a, p. 9–29).

Copper prices in 2011 reached record-high annual averages; the COMEX price averaged \$4.00 per pound and surpassed the previous high average of \$3.43 per pound in 2010. Copper prices began 2011 on an upward trend with the COMEX spot price reaching a record-high value of \$4.62 per pound in February. In September, prices declined sharply, falling to a low of \$3.05 per pound before cycling back to an average of \$3.43 per pound in December.

The principal mining States for copper were, in descending order of production, Arizona, Utah, Nevada, New Mexico, and Montana, and accounted for more than 99% of domestic production; copper was also recovered at mines in Alaska, Idaho, and Missouri. Although copper was recovered at 29 mines in the United States during 2010, 19 mines accounted for more than 99% of production (table 2). The remaining mines were either small leach operations or byproduct producers of copper.

In 2011, copper recovered from refined or remelted scrap (about 81% from new scrap and 19% from old scrap) composed 33% of the total U.S. copper supply. The conversion of old scrap to alloys and refined copper increased by about 7% from the revised quantity in 2010 and was at its highest level since 2008, accounting for about 6% of apparent supply. In addition to scrap consumed domestically, an additional 1.2 Mt of scrap (gross weight) was exported, the majority of which was thought to be old scrap. 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.

## Legislation and Government Programs

In June 2011, the U.S. International Trade Commission (USITC) voted to conduct a full 5-year review of antidumping orders on brass sheet and strip from France, Germany, Italy, and Japan. Under terms of the Uruguay Round Agreements Act, the Department of Commerce would be required to revoke the duties unless termination likely would lead to continuation or recurrence of dumping and material injury within a reasonably foreseeable future. In March 2012, the USITC announced that it had determined that revoking the existing antidumping orders would likely lead to such continuation or recurrence and that the existing antidumping orders were to remain in place (U.S. Department of Commerce, 2011a; 2012).

In May, the Mexican affiliate of China-based Golden Dragon Precise Tube Group Inc. filed a request with the U.S. Department of Commerce for a new “shipper review” of the antidumping duty order on seamless refined copper pipe and tube from Mexico imposed on their products in November 2010. The determination required importers to deposit with the U.S. Customs and Border Protection Service a cash amount equal to the listed estimated weighted-average margins that ranged between 11.25% ad valorem and 60.85% ad valorem for nine Chinese exporters, and 24.89% and 27.16% for various Mexican exporters. Meanwhile, Golden Dragon announced that it intended to build a 45,000-t/yr copper tube plant in Thomasville, AL. The Golden Dragon plant in Mexico opened in September 2009 and had been planned to supply the U.S. market. By yearend 2011, however, a final determination on the antidumping order review was still pending and Golden Dragon had yet to break ground on its new tube mill (Mazzilli, 2011; U.S. Department of Commerce, 2010, 2011b).

## Production

**Domestic Industry Structure.**—Mine production in the United States remained essentially unchanged in 2011 as production increases in Arizona and New Mexico of 7% and 25%, respectively, were offset by a decline of 16% in other States, principally Utah, where a continued decline in ore grades at the second leading U.S. copper producer led to a sharp decrease in production. Owing to the lower ore grades in Utah, and an increase in production from lower-grade ores in Arizona, the copper yield of concentrated copper ore declined by 14%. Mine capacity, however, rose by about 3% (60,000 t) to 1.76 Mt from the revised 2010 capacity of 1.70 Mt and capacity utilization declined to 63%. Smelter and downstream electrolytically refined copper production, however, decreased by 10% and 13%, respectively, to their lowest levels since 2006. Smelter production decreased because of maintenance shutdowns and reduced concentrate production in Utah. Electrolytic refined production declined owing to the shortfall in domestic anode production and to the permanent closure of the White Pine, MI, refinery in August 2010, which had processed anodes imported from Canada. Electrowon copper from leach solutions accounted for 40% and 45%, respectively, of mine and refinery production. Fifteen solvent extraction-electrowinning (SX-EW) facilities operated during 2011.

**Operating Property Reviews.**—ASARCO LLC (Phoenix, AZ) reported that it produced 145,000 t of refined copper at its Amarillo, TX, refinery and 59,700 t of electrowon copper from its Ray and Silver Bell Mines in Arizona. Although SX-EW production was essentially unchanged from that in 2010, electrolytic production was down by about 8% owing to a 12% decline in anode production at its Hayden, AZ, smelter. The Mission and Ray Mines had a combined mill throughput of 30 Mt grading an average of 4.2% copper (Grupo México, S.A.B. de C.V., 2012, p. 27–28).

Copper production from BHP Billiton’s (Melbourne, Australia, and London, United Kingdom) residual Arizona leach operations at Pinto Valley declined slightly to 2,800 t. Production of copper concentrate at Pinto Valley remained suspended, although in February 2012, BHP Billiton announced

that it planned to restart mining by yearend 2012 and produce 60,000 t/yr of copper in concentrate (BHP Billiton, 2011; 2012, p. 7).

Production of copper at Freeport McMoRan Copper & Gold Inc.’s (FCX) U.S. operations increased to 612,000 t in 2011 from 519,000 t in 2010. The Morenci Mine in Arizona regained its position as the leading U.S. copper mine. During 2011, FCX completed ramp up of the mining rate at Morenci to 635,000 metric tons per day (t/d) of ore and milling rates to 50,000 t/d; mining rates had been reduced sharply in 2008 and 2009 owing to weak market conditions. Production of recoverable copper increased to 278,000 t from 232,000 t in 2010, yet remained well below the 367,000 t produced in 2007. SX-EW production at the Safford Mine in Arizona rose to 68,500 t (6%) during 2011, and a sulfur burner, intended to provide lower cost sulfuric acid, was completed. Following restart of mining during 2010 at the Miami Mine (Arizona) and Chino Mine (New Mexico), SX-EW production at Miami rose to 30,000 t in 2011 from 8,000 t in 2010, and combined concentrate and leach production at Chino rose to 31,000 t from 15,000 t in 2010. Combined leach and concentrate production at the Sierrita Mine (Arizona) rose to 80,300 t from 66,700 t in 2010 and leach production at the Tyrone Mine (New Mexico) decreased to 34,000 t from 37,000 t in 2010 (Freeport McMoRan Copper & Gold Inc., 2012, p. 6–11, 23).

At the Bingham Canyon Mine in Utah, production continued to decline, decreasing by 22% to 195,000 t of contained copper, as mining progressed through lower grade areas of the mine. While mill throughput of 53 Mt was only slightly lower than the record-high level in 2010, mill-head grades decreased to an average of 0.43% copper from 0.53% in 2010. Average molybdenum grades, however, remained unchanged at 0.045%. Production of refined copper decreased to 215,000 t, about 20%, from that in 2010. During 2011, mine operator Kennecott Utah Copper Corp. (Magna, UT) began the process of updating environmental permits to extend the mine life to 2028 through a possible combination of open pit and underground mining and began constructing a \$340 million molybdenum autoclave to process molybdenum concentrates (Rio Tinto plc, 2012, p. 3, 22).

In September, Mercator Minerals Ltd. (Kingman, AZ, and Vancouver, British Columbia, Canada) completed the phase 2 expansion at its Mineral Park Mine in Arizona, which increased mill capacity to 45,000 t/d from 27,000 t/d. Mercator reported a record-high average mill throughput of 41,000 t/d during the fourth quarter and a record-high annual production of 19,200 t (17,600 t of copper in concentrate and 1,600 t of electrowon copper), a 32% increase from production in 2010 (Mercator Minerals Ltd., 2012).

In July 2010, Nord Resources Corp. (Dragoon, AZ) suspended mining and crushing of new ore at its Johnson Camp Mine in Arizona in order to maximize cash flow, conserve capital, and undertake additional geologic and engineering studies prior to installation of a new leach pad. In 2011, Nord reported selling 1,630 t of electrowon copper from residual leach operations, down from 4,120 sold in 2010. At yearend, Nord was seeking about \$20 million in new capital to construct a new leach pad and to resume mining (Nord Resources Corp., 2012, p. 2).

Production at Quadra FNX Mining Ltd.'s (Vancouver) Robinson Mine in Nevada decreased to 43,000 t in 2011 from 49,400 t owing to mill maintenance and lower-grade ore in the Ruth pit. During the fourth quarter of 2010, a shift in production from the Veteran and Ruth pits to just the Ruth pit was completed. At its Carlota Mine in Arizona, production of electrowon copper decreased to 11,000 t from 14,500 t in 2010. On March 5, 2012, KGHM Polska Miedź S.A. (Lubin, Poland) acquired 100% of the outstanding shares of Quadra FNX, which then operated as KGHM International Ltd. (Vancouver) (KGHM International Ltd. 2012a, p.1–8; 2012b).

## Consumption

U.S. reported consumption of refined copper remained essentially unchanged in 2011. Consumption by wire-rod producers, which accounted for 72% of reported consumption, increased slightly, and consumption at brass mills, which accounted for about 24% of consumption, declined by about 6%. According to data compiled by the American Bureau of Metal Statistics, Inc. (ABMS) (2012), however, domestic apparent consumption of wire rod rose by about 3% as the United States reverted to being a net importer of about 16,000 t of wire rod, having had net exports of about 39,000 t in 2010. According to U.S. Geological Survey data, shipments of copper and copper alloy mill products by domestic producers were essentially unchanged in 2011 at 951,000 t.

According to preliminary data from the Copper Development Association Inc. (2012, p. 18–20), 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 net imports, declined by about 3% from those in 2010. With the exception of 2010, where revised shipment data indicate about a 2% increase, shipments to the domestic market have trended downward since 2004. Wire-mill products accounted for about 51% of total shipments to the domestic market; brass mill products, 45%; and foundry and powder products, 4%. Shipments to the building construction sector, which remained the leading end-use market, declined by about 4% and accounted for about 44% of shipments. Shipments to the electric and electronic products (20% market share), consumer and general products (12% market share), and industrial machinery and equipment (8% market share) sectors declined by 4%, 2%, and 14%, respectively, while shipments to transportation equipment (16% market share), rose by 14%.

## Prices and Stocks

Copper prices trended upward during the last 6 months of 2010, the COMEX price rising from \$2.94 per pound at the end of June to its year-high value of \$4.44 per pound on December 31. Although volatile through several cycles, prices remained high during the first 8 months of 2011, the COMEX spot price averaging \$4.26 per pound during the period and reaching a new record high of \$4.62 per pound in mid-February. The sustained high prices took place despite rising inventories of copper on the global commodity exchanges (COMEX, London Metal Exchange Ltd., and SHFE), which rose from 568,000 t at yearend 2010 to 678,000 t at the end of March,

cycled down to 568,000 t at the end of August, and then rose again to 652,000 t at the end of September. The higher prices, however, coincided with increased investor interest, continued high imports of copper into China, and perceptions of continued supply shortages.

In mid-September, prices began a sharp decline, the COMEX spot price averaging only \$3.49 per pound for the September to December period, and ending the year at \$3.43 per pound. The downward price trend ran contrary to that indicated by declining stocks and increased imports of refined copper by China. Combined exchange stocks trended downward to close the year at 545,000 t, essentially the same level as at yearend 2010. Imports of refined copper into China during the fourth quarter of 2011 were at a record-high 1.05 Mt. Lower prices during the fourth quarter in 2011 appeared to reflect growing concern over the debt crisis in Europe and a decline in investor interest.

Copper scrap prices generally followed the trend in refined copper prices. With higher refined copper prices, however, the discount of most grades of copper scrap to refined copper increased. According to American Metal Market price data, the discount for refiners' No. 2 scrap from the COMEX spot price averaged 49.3 cents per pound in 2011, compared with 38.8 cents per pound in 2010, and ranged between 35.5 cents per pound in December and 73.6 cents per pound in February, when refined copper prices were at their peak. Although following the same trend, the discount for No. 1 brass mill scrap remained much smaller, averaging 10.9 cents per pound for the year, and ranging from 8.0 cents per pound in December to 17.0 cents per pound in January.

## Foreign Trade

Although reported U.S. consumption of refined copper remained essentially unchanged in 2011, net imports of refined copper in 2011 increased by about 100,000 t from those in 2010, reversing a 4-year downward trend. The increase corresponded with lower domestic production and an increase yearend inventories. Chile, Canada, and Mexico were the leading sources of refined copper imports in 2011, accounting for 55%, 21%, and 14%, respectively, of refined imports. From 2008 through 2011, Chile was the leading source of unwrought copper products (43%), followed by Canada (32%), and Peru (16%). Refined copper accounted for 84% of unwrought copper imports during the same period. Exports of copper contained in concentrates increased by more than 80%, reversing a 2-year downward trend, owing to increased mine production from nonintegrated producers and maintenance shutdowns at the three integrated domestic smelters that reduced domestic demand for concentrates.

According to the U.S. Census Bureau data compiled by the Copper and Brass Fabricators Council Inc. (2012, p. 1–9), in 2011, U.S. imports of copper and copper-alloy semifabricated products (excluding wire-rod mill products) were 218,000 t (a decrease of 4% from those in 2010), exports were 108,000 t (an increase of 4%), and the resulting net imports declined by about 10% to 109,000 t. Canada and Mexico collectively accounted for 68% of semifabricated copper exports and 20% of imports. China, which had been the leading source of imports in 2009 (26% share), continued to lose market share and accounted for



only 9% of imports in 2011 following the ITA antidumping orders on copper tube from China and Mexico instituted in November 2010. (More information can be found under Legislation and Government Programs.) Imports of copper tube from China and Mexico declined by 78% (38,000 t) and 92% (21,000 t), respectively, from those in 2009 (U.S. Department of Commerce, 2010).

In response to higher copper prices, and therefore increased scrap availability, exports of copper and copper alloy scrap rose by 20% to a record-high 1.24 Mt. China (including Hong Kong) was the destination for 79% of domestic scrap exports and, based on global import data, was the recipient of 62% of reported global scrap trade of 7.7 Mt. Canada, the second-ranked recipient of U.S. scrap, received 5%. Germany and Belgium, the leading secondary copper smelting countries in Europe, were significant recipients of U.S. scrap, together accounting for 4% of U.S. scrap exports and 12% of global imports in 2011 (International Copper Study Group, 2012a, p. 404–1).

## World Review

Following 2 years of limited growth (2008–09), world production of refined copper rose for the second consecutive year, increasing by about 550,000 t (about 3%) owing to an across-the-board increase in primary and secondary production. Production of refined copper from electrowinning rose by 4%, electrolytic and fire refining (other primary) by 2%, and secondary (from scrap) by almost 6%. World apparent copper use, according to revised ICSG data, rose by about 520,000 t (2.7%) to a record-high 19.9 Mt. Consequently, the ICSG global market balance indicated a production deficit for the second consecutive year, amounting to about 200,000 t in 2011 and totaling 550,000 t during the 2-year period. Stocks held on the more visible commodity exchanges decreased by only about 24,000 t to 545,000 t. ICSG estimates of total reported inventories (exchanges, governments, and industry) remained essentially unchanged at 1.2 Mt. With the exception of exchange inventories, inventory levels in China were not reported and were not considered in these analyses. Consumption data for China are based on apparent consumption of refined copper (production, net trade, and SHFE stock changes) and did not account for changes in industry and government stock levels (International Copper Study Group, 2012a, p. 9–20).

World mine production of copper, which rose nominally (127,000 t) in 2010 to 16.1 Mt, remained unchanged in 2011. World copper mine production remained relatively flat from 2007 to 2011, increasing by about 3.8% during the period. According to data compiled by the ICSG, this low level of growth took place despite an estimated 2.2 Mt/yr (12%) increase in capacity from 2007 to 2011. Consequently, based on ICSG production and capacity data, capacity utilization at global copper mines continued the downward trend that began in 2002, capacity utilization having peaked at more than 95% in 2001, declining to 79% in 2011. Numerous factors contributed to the downward trend, including competition for labor, power, and equipment during the prerecession global boom in mineral commodity production; labor unrest, in part encouraged by higher prices; preferential mining of coproducts; political

uncertainty; and technical problems associated with aging and expanding operations. The sharp fall in prices during the fourth quarter of 2008 that had led to industry curtailments and delays or deferrals of anticipated projects continued to limit production in 2011 (International Copper Study Group, 2012b, p. 13).

Significant declines in copper mine production in Chile and Indonesia were offset by increased production in Australia, China, Congo (Kinshasa), and Mexico. In Chile, copper mine production declined by more than 150,000 t to its lowest level since 2003, principally owing to an almost 300,000 t decline in production at the Escondida Mine, the world's leading copper-producing mine, owing to lower ore grades and labor strikes. In Indonesia, copper mine production declined by 335,000 t owing to continued production difficulties and labor unrest that led to worker blockades at the Batu Hijau Mine (Newmont Mining Corp. and others) and labor strikes and equipment damage at FCX's Grasberg operations during the fourth quarter of the year. Production at Batu Hijau decreased by 48% (117,000 t) and production at Grasberg declined by 31% (188,000 t) (BHP Billiton, 2012, p. 7; Freeport-McMoRan Copper & Gold Inc., 2012, p. 23; Newmont Mining Corp., 2012).

In Mexico, production rose by 64% (173,000 t) owing to resumption of mining in October 2010 at the Buenavista del Cobre Mine (Grupo Mexico), following a strike that lasted more than 3 years. In Australia, production at the Olympic Dam Mine rose by 65,000 t owing to restoration of production following a conveyor failure in 2010. Production in the Congo (Kinshasa) rose by about 90,000 t owing to startup or expansion of several electrowinning operations (BHP Billiton, 2012, p. 2; Grupo México, S.A.B. de C.V., 2012, p. 24).

According to ICSG data (2012b, p. 15), global smelter capacity increased by about 340,000 t/yr in 2011 to 18.5 million metric tons per year. Global smelter capacity utilization declined slightly, however, as production in 2011 increased by only about 225,000 t. A decline in primary smelter production in 2011 owing to a shortage of concentrates (production of which declined by almost 150,000 t) was more than offset by a 335,000 t-increase in secondary smelter production, principally in China.

According to CRU International Ltd. (2011a, p. 69–75; 2012, p. 73–75) consumption of copper in concentrates during 2011 exceeded production by about 200,000 t. According to CRU revised data for 2010, a concentrate surplus had developed by the end of 2010 owing to smelter maintenance projects and cutbacks and delays in new capacity in China. Although concentrate stocks began to fall early in 2011, a significant quantity of concentrate was released into the market after the earthquake and tsunami that temporarily shut the Onahama smelter in Japan in February, leading to a brief surge in spot treatment (smelting) and refining charges. Spot treatment and refining charges, which began the year at about 15 cents per pound of payable copper, surged to more than 27 cents per pound in March following the Japanese crisis, before trending sharply downward to less than 5 cents per pound at yearend. Spot treatment and refining charges have trended lower since 2005, when they averaged about 40 cents per pound of copper. Term contracts were much less volatile and averaged about 15 cents per pound during the first half of the year, rising to 22

cents per pound for contracts negotiated for delivery during the second half of the year (CRU International Ltd., 2011b, p. 74).

Global consumption of refined copper rose for the second consecutive year, increasing by about 2.6% (50,000 t) to a record-high 19.9 Mt in 2011. China, where apparent consumption increased by 7.1% (530,000 t) to account for 40% of global consumption, and Russia, where apparent consumption increased by 59% (265,000 t), accounted for most of the consumption growth. Copper consumption decreased in Asia's other major copper-consuming countries (India, Japan, Republic of Korea, Taiwan, and Vietnam). Consumption in the European Union declined slightly and consumption in North America remained unchanged. Consumption in Russia rose sharply owing to an export tariff imposed on refined copper that encouraged the conversion of cathode to wire rod prior to export. Reported exports of copper alloy semifabricates from Russia rose by about 170,000 t. China's apparent consumption excludes estimates of unreported stock changes, which can distort year-on-year changes. While China's apparent consumption in 2011 increased by more than 7%, reported production of copper semifabricates increased by only about 2% (International Copper Study Group, 2012a, p. 10–23, 38).

## Outlook

Although refined copper prices remained volatile during the first 9 months of 2012, they traded within a narrower range than in recent years. The COMEX spot copper price began the year at \$3.53 per pound of copper, rose to \$3.92 per pound in April, retreated to a low of \$3.28 per pound in June, and then trended back up to a peak of \$3.85 per pound in September. The balance between copper supply and demand remained tight throughout this period and was strongly influenced by exports of refined copper to China. Apparent usage in China in the first half of 2012 increased by 27% compared with that in the first half of 2011 owing to an 80% increase in net imports of refined copper. Anecdotal evidence, however, suggests that the high import level in 2012 exceeded industrial demand and was accompanied by increased inventories held in bonded warehouses. During the first half of 2012, U.S. exports of refined copper rose to record high levels and totaled 135,000 t, nearly four times the total refined exports for all of 2011, and domestic inventories declined by about 200,000 t to about one-half the yearend 2011 level.

In September 2012, the International Copper Study Group (2012c) projected that global refined copper consumption in 2012 would exceed refined copper production by about 400,000 t, continuing the global production deficit for the third consecutive year. Operational problems and labor unrest, including strikes in Chile and Indonesia, continued to constrain world copper mine output, and the mine capacity utilization rate was projected to remain at 79%. Global consumption and production of refined copper were projected to increase by 1.5% and 2.6%, respectively, in 2012. Apparent consumption in China was expected to increase by more than 8%, accounting for 42% of global consumption, while consumption exclusive of China was projected to decline slightly.

U.S. mine production was projected to increase by about 4% in 2012, as mine cutbacks instituted at yearend 2008 in Arizona,

Nevada, and New Mexico, were restored. These increases were expected to be partially offset by lower ore grades and production at the second-ranked U.S. copper mine in Utah. Electrolytic refinery production was expected to decrease by about 9% owing to a shortage of domestic anode, the latter resulting from maintenance shutdowns at the three domestic smelters. Total refined production, however, was expected to remain unchanged as increases in electrowon production and secondary refined production were expected to balance the decline in electrolytic production. In June, a new integrated fire refinery and wire-rod mill were commissioned that were expected to increase domestic production and consumption of fire refined copper. Domestic consumption of refined copper was expected to increase slightly from that in 2011.

In 2013, domestic mine and refined production of copper are expected to increase by more than 10% as production ramp ups at mines are completed, ore grades in Utah increase, smelters operate throughout the year, and fire-refined production increases. According to ICSG projections (2012c), refined copper output in 2013 was expected to exceed consumption owing to more modest growth in China and a 6% growth in global refined production.

## References Cited

- American Bureau of Metal Statistics, Inc., 2012, US copper wirerod market—December and full year 2011: Chatham, NJ, American Bureau of Metal Statistics, Inc. Report 4, April 5, 7 p.
- BHP Billiton, 2011, Restart of Pinto Valley: London, United Kingdom, BHP Billiton news release, February 14. (Accessed March 1, 2011, at <http://www.bhpbilliton.com/home/investors/news/Pages/Articles/Restart-of-Pinto-Valley.aspx>.)
- BHP Billiton, 2012, BHP Billiton production report for the half year ended 31 December 2011: London, United Kingdom, BHP Billiton news release, January 18, 20 p. (Accessed June 20, 2012, at [http://www.bhpbilliton.com/home/investors/reports/documents/2012/120118\\_BHPBilliton\\_Production\\_Report\\_for\\_the\\_Half\\_Year\\_Ended\\_31\\_December\\_2011.pdf](http://www.bhpbilliton.com/home/investors/reports/documents/2012/120118_BHPBilliton_Production_Report_for_the_Half_Year_Ended_31_December_2011.pdf))
- Copper and Brass Fabricators Council Inc., 2012, Copper and brass products import and export report—December 2011: Washington, DC, Copper and Brass Fabricators Council Inc., February 14, 232 p.
- Copper Development Association Inc., 2012, Annual data 2012—Copper supply and consumption: New York, NY, Copper Development Association Inc., 21 p.
- CRU International Ltd., 2011a, Copper quarterly industry and market outlook—July 2011: London, United Kingdom, CRU International Ltd., 261 p.
- CRU International Ltd., 2011b, Copper quarterly industry and market outlook—October 2011: London, United Kingdom, CRU International Ltd., 261 p.
- CRU International Ltd., 2012, Copper quarterly industry and market outlook—January 2012: London, United Kingdom, CRU International Ltd., 277 p.
- Grupo México, S.A.B. de C.V., 2012, Annual report—2011: Mexico City, Mexico, Grupo México, S.A.B. de C.V., 136 p.
- Freeport-McMoRan Copper & Gold Inc., 2012, Form 10-K—2011: U.S. Securities and Exchange Commission, 191 p.
- International Copper Study Group, 2012a, Copper bulletin: Lisbon, Portugal, International Copper Study Group, v. 19, no. 10, October, 53 p.
- International Copper Study Group, 2012b, Directory of copper mines and plants 2010 to 2015—February: Lisbon, Portugal, International Copper Study Group, 118 p.
- International Copper Study Group, 2012c, Forecast 2012–2013: Lisbon, Portugal, International Copper Study Group press release, October 4, 1 p. (Accessed November 1, 2012, via <http://www.icsg.org/index.php/press-releases/viewcategory/113-forecast-press-release>.)
- KGHM International Ltd., 2012a, Management discussion and analysis for the first quarter ended March 31, 2012: Vancouver, British Columbia, Canada, KGHM International Ltd., 20 p. [undated]. (Accessed November 12, 2012, via <http://www.quadrafmx.com/en/information>.)

- KGHM International Ltd., 2012b, Quadra FNX announces Q4 2011 production & Victoria resource update: Vancouver, British Columbia, Canada, KGHM International Ltd., January 16, 3 p. (Accessed November 12, 2012, via <http://www.quadrafnx.com/en/information>.)
- Mazzilli, Meridth, 2011, Golden Dragon to build tube plant in Ala.: American Metal Market, March 28. (Accessed October 18, 2011, via <http://amm.com/>.)
- Mercator Minerals Ltd., 2012, Mercator Minerals reports fourth quarter and yearend 2011 results: Vancouver, British Columbia, Canada, Mercator Minerals Ltd., March 30. (Accessed September 8, 2012, at [http://www.mercatorminerals.com/s/NewsReleases.asp?ReportID=515857&Type=News-Releases&\\_Title=Mercator-Minerals-Reports-Fourth-Quarter-and-Year-End-2011-Results](http://www.mercatorminerals.com/s/NewsReleases.asp?ReportID=515857&Type=News-Releases&_Title=Mercator-Minerals-Reports-Fourth-Quarter-and-Year-End-2011-Results).)
- Newmont Mining Corp., 2012, Newmont—Regional operating statistics: Greenwood Village, CO, Newmont Mining Corp., 13 p. [undated]. (Accessed September 20, 2012 via <http://www.newmont.com/our-investors/stock-data/operating-statistics>.)
- Nord Resources Corp., 2012, Nord Resources reports 2011 year-end results: Tuscon, AZ, Nord Resources Corp. press release, March 29, 10 p. (Accessed July 28, 2012, at <http://www.nordresources.com/news/pdf/3292012-1.pdf>)
- Rio Tinto plc, 2012, Fourth quarter 2011 operations review: London, United Kingdom, Rio Tinto plc press release, January 17, 26 p. (Accessed June 30, 2012, at [http://www.riotinto.com/documents/PR947g\\_Fourth\\_quarter\\_2011\\_operations\\_review.pdf](http://www.riotinto.com/documents/PR947g_Fourth_quarter_2011_operations_review.pdf).)
- U.S. Department of Commerce, 2010, Seamless refined copper pipe and tube from Mexico and People's Republic of China antidumping duty orders and amended final determination of sales of less than fair value from Mexico: Federal Register, v. 75, no. 224, November 22, p. 71070–17072.
- U.S. Department of Commerce, 2011a, Brass sheet and strip from France, Germany, Italy, and Japan; notice of Commission determination to conduct full five-year reviews concerning the antidumping duty orders on brass sheet and strip from France, Germany, Italy, and Japan: Federal Register, v. 76, no. 118, June 20, p. 35910.
- U.S. Department of Commerce, 2011b, Seamless refined copper pipe and tube from Mexico—Notice of initiation of antidumping duty new shipper review: Federal Register, v. 76, no. 130, p. 39850.
- U.S. Department of Commerce, 2012, Brass sheet and strip from France, Italy, Germany, and Japan—Continuation of antidumping duty: Federal Register, v. 77, no. 81, April 26, p. 24932–24933.

## GENERAL SOURCES OF INFORMATION

### U.S. Geological Survey Publications

- Copper. Ch. in *Metal Prices in the United States Through 1998, 1999*.
- Copper. Ch. in *Mineral Commodity Summaries, annual*.
- Copper. *Mineral Industry Surveys, monthly*.
- Copper Recycling in the United States. U.S. Geological Survey Circular 1196–X.
- Flows of selected materials associated with world copper smelting. Open-File Report 2004–1395.

### Other

- American Bureau of Metal Statistics nonferrous metal data.
- Copper. Ch. in *Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985*.
- International Copper Study Group, *Copper Bulletin, monthly*.
- International Copper Study Group, *Directory of Copper Mines and Plants*.

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

(Metric tons, unless otherwise specified)

	2007	2008	2009	2010	2011	
United States:						
Mine production:						
Ore concentrated	thousand metric tons	138,000	219,000 <sup>r</sup>	149,000	152,000	172,000
Average yield of concentrated ore	percent	0.46	0.36 <sup>r</sup>	0.46	0.43	0.37
Recoverable copper:						
Arizona		731,000	836,000	711,000	703,000	751,000
New Mexico		108,000	104,000	56,500	52,700	66,000
Other States		329,000	368,000	414,000	353,000	296,000
Total		1,170,000	1,310,000	1,180,000	1,110,000	1,110,000
Total value	millions	\$8,450	\$9,200	\$6,290	\$8,520	\$9,960
Smelter production:						
Primary and secondary		617,000	574,000	597,000	601,000	538,000
Byproduct sulfuric acid, sulfur content	thousand metric tons	720	655	671	704 <sup>r</sup>	679
Refinery production:						
Primary materials:						
Electrolytic from domestic ores		702,000	603,000	588,000	606,000	545,000
Electrolytic from foreign materials		62,100	109,000	48,300	21,000	W
Electrowon		504,000	507,000	476,000	430,000	447,000
Total		1,270,000	1,220,000	1,110,000	1,060,000	992,000
Secondary materials (scrap), electrolytic and fire refined		46,000	53,800	46,400	37,700	37,300
Grand total		1,310,000	1,270,000	1,160,000	1,090,000	1,030,000
Secondary copper produced:						
Recovered from new scrap		772,000 <sup>r</sup>	700,000 <sup>r</sup>	639,000	642,000 <sup>r</sup>	649,000
Recovered from old scrap		162,000 <sup>r</sup>	159,000 <sup>r</sup>	138,000	143,000 <sup>r</sup>	153,000
Total		933,000 <sup>r</sup>	859,000 <sup>r</sup>	777,000	785,000 <sup>r</sup>	802,000
Copper sulfate production		20,500 <sup>r</sup>	22,000	22,400	23,700 <sup>r</sup>	22,800
Exports, refined		51,100	36,500	80,800	78,300	40,400
Imports, refined		829,000	724,000	664,000	605,000	670,000
Stocks, December 31:						
Blister and in-process material		26,300	24,100	15,500	21,100	13,000
Refined copper:						
Refineries		21,800	18,300	23,700	10,300	8,360
Wire-rod mills		20,600	31,700	24,700 <sup>r</sup>	19,700	24,000
Brass mills		10,400	8,340	7,610	6,400	6,850
Other industry		3,220	3,230	4,290	4,380	4,330
COMEX		13,500	31,300	90,000	58,600	79,800
London Metal Exchange (LME), U.S. warehouses		60,600	106,000	283,000	284,000	286,000
Total		130,000	199,000	434,000	384,000	409,000
Consumption:						
Refined copper, reported		2,140,000	2,020,000	1,650,000	1,760,000	1,760,000
Apparent consumption, primary refined and old scrap <sup>2</sup>		2,270,000	2,000,000	1,580,000	1,760,000	1,730,000
Price:						
Producer, weighted average	cents per pound	328.00	319.16	241.24	348.34	405.85
COMEX, first position	do.	322.17	313.35	235.42	342.51	400.05
LME, Grade A cash	do.	322.83	315.47	233.56	341.74	399.79
World, production:						
Mine	thousand metric tons	15,500	15,600	16,000 <sup>r</sup>	16,100 <sup>r</sup>	16,100
Smelter	do.	14,200 <sup>r</sup>	14,600 <sup>r</sup>	14,900 <sup>r</sup>	15,500 <sup>r</sup>	15,800
Refinery	do.	17,900	18,300	18,300 <sup>r</sup>	19,100	19,700

<sup>r</sup>Revised. do. Ditto. W Withheld to avoid disclosing company proprietary data.

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

<sup>2</sup>In 2007, 2008, 2009, 2010 and 2011, apparent consumption is calculated using general imports of 832,000 metric tons (t), 721,000 t, 645,000 t, 583,000 t, and 649,000 t respectively.



TABLE 2  
LEADING COPPER-PRODUCING MINES IN THE UNITED STATES IN 2011, IN ORDER OF OUTPUT<sup>1</sup>

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	400
2	Bingham Canyon	Salt Lake, UT	Kennecott Utah Copper Corp. <sup>2</sup>	Copper-molybdenum ore, concentrated and leached	300
3	Ray	Pinal, AZ	ASARCO LLC <sup>3</sup>	Copper ore, concentrated and leached	140
4	Bagdad	Yavapai, AZ	Freeport-McMoRan Copper & Gold Inc.	Copper-molybdenum ore, concentrated	110
5	Sierrita	Pima, AZ	do.	Copper-molybdenum ore, concentrated and leached	80
6	Safford	Graham, AZ	do.	Copper ore, leached	110
7	Mission Complex	Pima, AZ	ASARCO LLC <sup>3</sup>	Copper ore, concentrated	80
8	Robinson	White Pine, NV	Quadra FNX Mining Ltd.	Copper-molybdenum ore, concentrated	70
9	Tyrone	Grant, NM	Freeport-McMoRan Copper & Gold Inc.	Copper ore, leached	50
10	Continental Pit	Silver Bow, MT	Montana Resources	Copper-molybdenum ore, concentrated	40
11	Chino	Grant, NM	Freeport-McMoRan Copper & Gold Inc.	Copper-molybdenum ore, concentrated and leached	135
12	Miami	Gila, AZ	do.	Copper ore, leached	50
13	Silver Bell	Pima, AZ	ASARCO LLC <sup>3</sup>	do.	22
14	Mineral Park	Mohave, AZ	Mercator Minerals Ltd.	Copper-molybdenum ore, concentrated and leached	26
15	Phoenix	Lander, NV	Newmont Mining Corp.	Gold-copper ore, concentrated	18
16	Carlota	Gila, AZ	Quadra FNX Mining Ltd.	Copper ore, leached	15
17	Lisbon Valley	San Juan, UT	Lisbon Valley Mining Co. LLC	do.	7
18	Troy	Lincoln, MT	Revet Minerals Inc.	Copper-silver ore, concentrated	5
19	Pinto Valley	Gila, AZ	BHP Billiton	Copper-ore, leached	70

do. Ditto.

<sup>1</sup>The mines on this list accounted for more than 99% of U.S. mine production in 2011.

<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	2010		2011	
	Gross weight	Recoverable copper	Gross weight	Recoverable copper
Mined copper ore:				
Concentrated	152,000,000	659,000	172,000,000	643,000
Leached	NA	430,000	NA	447,000
Total	NA	1,090,000	NA	1,090,000
Copper precipitates shipped, leached from tailings, dumps, and in-place material	NA	W	NA	W
Other copper-bearing ores <sup>2</sup>	4,780,000	19,700	5,230,000	22,300
Grand total	XX	1,110,000	XX	1,110,000

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
2010:					
Copper scrap	698,000 <sup>2</sup>	W	74,800	157,000	929,000
Refined copper <sup>3</sup>	459,000	1,250,000	53,100	4,510	1,760,000
Hardeners and master alloys	10,100	--	4,370	--	14,400
Brass ingots	--	--	61,700	--	61,700
Slab zinc	44,800	--	(4)	(4)	106,000
2011:					
Copper scrap	707,000	W	77,200	157,000	942,000
Refined copper <sup>3</sup>	430,000	1,270,000	56,600	5,000	1,760,000
Hardeners and master alloys	10,100	--	4,410	--	14,500
Brass ingots	--	--	61,600	--	61,600
Slab zinc	39,300	--	(4)	(4)	40,400

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 ingot bars	Cakes and slabs	Wirebar, billets, other	Total
2010:					
Wire-rod mills	1,250,000	--	--	--	1,250,000
Brass mills	320,000	19,400	44,100	75,600	459,000
Chemical plants	--	--	--	385	385
Ingot makers	W	W	W	4,510 <sup>2</sup>	4,510
Foundries	3,470	3,150	--	11,500	18,200
Miscellaneous <sup>3</sup>	W	W	W	34,600 <sup>2</sup>	34,600
Total	1,570,000	22,500	44,100	127,000	1,760,000
2011:					
Wire-rod mills	1,270,000	--	--	--	1,270,000
Brass mills	305,000	W	43,800	81,700	430,000
Chemical plants	W	W	--	1,520	1,520
Ingot makers	W	W	W	5,000 <sup>2</sup>	5,000
Foundries	4,950	2,460	--	10,200	17,700
Miscellaneous <sup>3</sup>	W	W	W	37,500 <sup>2</sup>	37,500
Total	1,580,000	2,460	43,800	136,000	1,760,000

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>Includes items indicated by symbol W.

<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)

	2010	2011
<b>Kind of scrap:</b>		
<b>New scrap:</b>		
Copper-base	612,000 <sup>r</sup>	618,000
Aluminum-base	30,100 <sup>r</sup>	31,700
Nickel-base	18	18
Total	642,000 <sup>r</sup>	649,000
<b>Old scrap:</b>		
Copper-base	121,000 <sup>r</sup>	124,000
Aluminum-base	21,700 <sup>r</sup>	28,700
Nickel-base	267 <sup>r</sup>	267
Zinc-base	9	13
Total	143,000 <sup>r</sup>	153,000
<b>Grand total</b>	<b>785,000 <sup>r</sup></b>	<b>802,000</b>
<b>Form of recovery:</b>		
As unalloyed copper	39,000	38,400
In brass and bronze	689,000 <sup>r</sup>	699,000
In alloy iron and steel	731	692
In aluminum alloys	51,600 <sup>r</sup>	59,600
In other alloys	9	12
In chemical compounds	5,030	5,030
Total	785,000 <sup>r</sup>	802,000

<sup>r</sup>Revised.

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

TABLE 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	
	2010	2011	2010	2011	2010	2011
Ingot makers	12,200 <sup>r</sup>	11,800	63,600 <sup>r</sup>	64,600	75,700 <sup>r</sup>	76,400
Refineries <sup>2</sup>	19,100	18,900	18,600	18,400	37,700	37,300
Brass and wire-rod mills	548,000	553,000	17,200	17,600	565,000	571,000
Foundries and manufacturers	27,700	28,400	21,800 <sup>r</sup>	23,600	49,500 <sup>r</sup>	52,000
Chemical plants	5,030	5,030	--	--	5,030	5,030
Total	612,000 <sup>r</sup>	618,000	121,000 <sup>r</sup>	124,000	733,000 <sup>r</sup>	742,000

<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 based on source of material 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	2010	2011
<b>Unalloyed copper products:</b>		
Refined copper	37,700	37,300
Copper powder	1,230	1,030
Copper castings	82	124
Total	39,000	38,400
<b>Alloyed copper products:</b>		
<b>Brass and bronze ingots:</b>		
Tin bronzes	8,100 <sup>r</sup>	9,050
Leaded red brass and semired brass	51,400 <sup>r</sup>	51,200
High leaded tin bronze	8,480 <sup>r</sup>	9,650
Yellow brass	5,090 <sup>r</sup>	5,280
Manganese bronze	7,600 <sup>r</sup>	7,500
Aluminum bronze	6,240 <sup>r</sup>	6,330
Nickel silver	1,040	1,020
Silicon bronze and brass	4,840 <sup>r</sup>	4,740
Copper-base hardeners and master alloys	7,670	5,250
Miscellaneous	7,720	7,800
Total	108,000 <sup>r</sup>	108,000
Brass mill and wire-rod mill products	689,000	701,000
Brass and bronze castings	44,400 <sup>r</sup>	45,000
Copper in chemical products	5,030	5,030
Grand total	886,000 <sup>r</sup>	897,000

<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
<b>Brass and bronze ingot production:<sup>2</sup></b>							
2010 <sup>r</sup>	90,100	3,530	5,040	9,450	116	14	108,000
2011	89,200	3,800	5,360	9,310	106	13	108,000
<b>Secondary metal content of brass mill products:</b>							
2010	570,000	1,400	2,020	115,000	1,060	16	689,000
2011	578,000	1,360	2,310	118,000	1,100	16	701,000
<b>Secondary metal content of brass and bronze castings:</b>							
2010	41,000 <sup>r</sup>	1,100	574	1,460	130	101	44,400 <sup>r</sup>
2011	41,800	1,090	564	1,370	90	103	45,000

<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>Includes approximately 96% from scrap and 4% from other than scrap in 2010 and 2011.



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

(Metric tons, gross weight)

Scrap type and processor	2010		2011	
	Consumption	Stocks	Consumption	Stocks
<b>Unalloyed scrap:</b>				
No.1 wire and heavy:				
Smelters, refiners, and ingot makers	17,700 <sup>r</sup>	932 <sup>r</sup>	17,100	970
Brass and wire-rod mills	319,000	(2)	324,000	(2)
Foundries and miscellaneous manufacturers	27,400 <sup>r</sup>	(2)	28,200	(2)
No. 2 mixed heavy and light:				
Smelters, refiners, and ingot makers	60,000 <sup>r</sup>	2,530 <sup>r</sup>	62,000	1,540
Brass and wire-rod mills	10,200	(2)	9,530	(2)
Foundries and miscellaneous manufacturers	7,260	(2)	9,150	(2)
<b>Total unalloyed scrap:</b>				
Smelters, refiners, and ingot makers	77,700 <sup>r</sup>	3,460 <sup>r</sup>	79,100	2,510
Brass and wire-rod mills	330,000	686	333,000	509
Foundries and miscellaneous manufacturers	34,700 <sup>r</sup>	2,250 <sup>r</sup>	37,300	4,000
<b>Alloyed scrap:</b>				
Red brass: <sup>3</sup>				
Smelters, refiners, and ingot makers	23,800 <sup>r</sup>	1,850 <sup>r</sup>	22,300	2,050
Brass mills	11,100	(2)	9,700	(2)
Foundries and miscellaneous manufacturers	2,790	(2)	2,690	(2)
Leaded yellow brass:				
Smelters, refiners, and ingot makers	10,000 <sup>r</sup>	958 <sup>r</sup>	10,000	813
Brass mills	103,000	(2)	118,000	(2)
Foundries and miscellaneous manufacturers	971	(2)	930	(2)
Yellow and low brass, all plants	147,000 <sup>r</sup>	749 <sup>r</sup>	146,000	918
Cartridge cases and brass, all plants	98,200	(2)	91,800	(2)
Auto radiators:				
Smelters, refiners, and ingot makers	20,500 <sup>r</sup>	1,000 <sup>r</sup>	20,500	829
Foundries and miscellaneous manufacturers	1,900	(2)	1,900	(2)
Bronzes:				
Smelters, refiners, and ingot makers	12,200 <sup>r</sup>	1,050 <sup>r</sup>	12,800	885
Brass mills and miscellaneous manufacturers	16,300	(2)	15,500	(2)
Nickel-copper alloys, all plants	9,740 <sup>r</sup>	175 <sup>r</sup>	9,620	152
Low grade and residues; smelters, refiners, miscellaneous manufacturers	23,000	756 <sup>r</sup>	22,900	593
Other alloy scrap: <sup>4</sup>				
Smelters, refiners, and ingot makers	1,290	514 <sup>r</sup>	1,510	793
Brass mills and miscellaneous manufacturers	5,340	(2)	5,650	(2)
<b>Total alloyed scrap:</b>				
Smelters, refiners, and ingot makers	78,900 <sup>r</sup>	7,140 <sup>r</sup>	78,000	6,850
Brass mills	368,000	547	374,000	584
Foundries and miscellaneous manufacturers	40,100	2,050 <sup>r</sup>	39,900	1,990
<b>Total scrap:</b>				
Smelters, refiners, and ingot makers	157,000 <sup>r</sup>	10,600 <sup>r</sup>	157,000	9,360
Brass and wire-rod mills	698,000	1,230	707,000	1,090
Foundries and miscellaneous manufacturers	74,800 <sup>r</sup>	4,290 <sup>r</sup>	77,200	5,990

<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	
	2010	2011	2010	2011	2010	2011
Ingot makers	28,800 <sup>r</sup>	28,800	89,000 <sup>r</sup>	89,900	118,000 <sup>r</sup>	119,000
Smelters and refineries	20,100	19,700	18,800	18,700	38,900	38,400
Brass and wire-rod mills	681,000	689,000	17,500	18,200	698,000	707,000
Foundries and miscellaneous manufacturers	51,300 <sup>r</sup>	52,000	23,500 <sup>r</sup>	25,200	74,800 <sup>r</sup>	77,200
Total	781,000 <sup>r</sup>	790,000	149,000 <sup>r</sup>	152,000	929,000 <sup>r</sup>	942,000

<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	2010	2011
Tin bronzes	9,150 <sup>r</sup>	8,550
Leaded red brass and semired brass	36,800 <sup>r</sup>	36,500
Yellow, leaded, low brass <sup>2</sup>	7,140 <sup>r</sup>	7,140
Manganese bronze	2,420	2,530
Nickel silver <sup>3</sup>	483	879
Aluminum bronze	3,560 <sup>r</sup>	4,130
Hardeners and master alloys <sup>4</sup>	4,370	4,410
Lead free alloys <sup>5</sup>	2,170	1,820
Total brass ingot	66,100 <sup>r</sup>	66,000
Refined copper	53,100	56,600
Copper scrap	74,800 <sup>r</sup>	77,200

<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 No. 1 scrap	Refiners No. 2 scrap	Dealers' buying (New York)	
			No. 2 scrap	Red brass turnings and borings
2010 <sup>r</sup>	332.16	303.95	255.21	165.46
2011	389.12	350.72	301.67	188.28

<sup>r</sup>Revised.

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 (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)
2010	137,000	\$916,000	44,000	\$95,400	16,900	\$99,400	78,300	\$515,000	334,000	\$1,590,000	609,000	\$3,220,000
2011:												
Belgium	139	796	472	1,280	76	378	--	--	14,400	78,000	15,100	80,400
Canada	14,300	127,000	35,900	78,300	4,440	20,200	3,980	22,500	20,400	177,000	79,100	425,000
China	97,000	611,000	1,190	8,490	616	3,910	4,460	17,000	383,000	1,880,000	487,000	2,520,000
Germany	110	559	402	2,050	911	10,100	81	170	8,470	57,100	9,970	70,000
Hong Kong	17	139	--	--	1,150	10,700	19	40	5,970	31,100	7,150	42,000
India	20	122	36	48	613	5,300	22	182	1,690	10,300	2,380	16,000
Japan	22,000	156,000	172	947	862	8,220	11	23	8,810	62,300	31,900	227,000
Korea, Republic of	--	--	--	--	761	7,170	104	291	19,100	150,000	20,000	158,000
Mexico	114,000	813,000	--	--	255	1,480	27,800	178,000	3,150	24,100	145,000	1,020,000
Philippines	4,110	30,100	5	8	1,090	5,900	20	209	100	869	5,320	37,100
Spain	6	20	--	--	228	2,190	1,040	8,840	5,170	41,000	6,440	52,000
Other	286	1,950	96	140	3,260	22,700	2,890	18,400	29,800	195,000	36,300	238,000
Total	252,000	1,740,000	38,300	91,300	14,300	98,200	40,400	246,000	501,000	2,710,000	846,000	4,880,000

-- Zero.

<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 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 (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2010	17,500	\$159,000	24,100	\$211,000	163,000	\$1,100,000	25,400	\$256,000	7,970	\$14,100
2011:										
Bahamas, The	4	26	31	127	44	419	111	1,190	--	--
Belgium	1	7	19	969	15	100	157	6,980	389	1,960
Canada	7,150	68,200	12,500	123,000	39,800	359,000	13,700	133,000	2,550	6,570
China	98	1,140	1,690	17,500	4,830	34,600	1,920	25,600	511	1,460
Colombia	68	526	168	2,010	26	323	101	1,630	1	3
Costa Rica	9	80	365	1,380	12	281	60	657	--	5
Czech Republic	19	316	4	89	100	3,260	(3)	20	--	--
Dominican Republic	13	171	8	33	137	1,320	52	480	1	5
Germany	21	256	253	5,270	113	3,040	82	3,500	193	816
Hong Kong	4	131	425	8,090	98	808	89	3,610	--	--
India	9	251	500	4,340	68	1,740	55	901	--	--
Israel	2	27	25	526	30	300	39	1,150	685	1,460
Japan	8	118	225	4,630	89	5,920	168	5,340	49	262
Korea, Republic of	78	1,820	128	3,520	488	5,940	176	6,670	93	269
Malaysia	6	102	1,290	16,300	89	3,150	19	541	67	101
Mexico	10,300	110,000	9,200	88,600	96,900	834,000	13,600	137,000	61	234
Netherlands	71	712	33	474	60	467	61	662	197	1,160
Saudi Arabia	1,720	19,700	14	153	--	--	318	2,090	14	11
Singapore	55	636	104	1,420	155	1,690	75	2,200	53	76
Taiwan	2	21	1,540	12,500	23	225	58	1,000	913	2,210
Trinidad and Tobago	5	45	(3)	6	554	3,310	76	948	4	13
United Arab Emirates	825	9,070	44	511	5	19	144	2,310	--	--
United Kingdom	161	1,840	104	2,010	96	1,010	61	1,910	5	24
Other	645	7,570	705	8,790	674	16,600	1,570	20,000	728	1,730
Total	21,300	223,000	29,300	302,000	144,000	1,280,000	32,700	359,000	6,510	18,400

-- 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 2010 were 143,559 metric tons (t) valued at \$940 million, and in 2011, wire rod exports were 128,497 t valued at \$1,123 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 (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)
2010	1,390	\$2,240	840	\$3,050	26,300	\$201,000	605,000	\$4,470,000	21,400	\$90,400	655,000	\$4,770,000
2011:												
Canada	8,430	99,400	239	1,340	2	56	138,000	1,220,000	14,600	105,000	161,000	1,430,000
Chile	--	--	--	--	--	--	370,000	3,360,000	39	357	370,000	3,360,000
Costa Rica	--	--	4	23	--	--	--	--	834	4,020	838	4,040
Dominican Republic	--	--	--	--	--	--	--	--	1,250	2,230	1,250	2,230
Germany	--	--	54	265	(3)	4	3,020	29,400	19	101	3,100	29,800
Japan	--	--	(3)	3	16	1,100	5,540	60,600	29	82	5,580	61,800
Mexico	6,710	44,500	--	--	--	--	97,100	851,000	8,390	43,400	112,000	939,000
Nicaragua	--	--	--	--	--	--	--	--	1,080	2,790	1,080	2,790
Peru	--	--	--	--	--	--	55,200	493,000	21	100	55,200	493,000
Other	(3)	3	686	4,090	453	4,720	1,090	11,000	4,140	13,200	6,360	33,000
Total	15,100	144,000	983	5,720	471	5,880	670,000	6,030,000	30,400	171,000	717,000	6,360,000

-- 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>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 (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)
2010	4,120	\$34,900	57,600	\$521,000	114,000	\$873,000	10,200	\$91,200	48,000	\$107,000
2011:										
Brazil	--	--	854	8,750	10	62	--	--	--	--
Canada	7	260	2,640	26,400	106,000	971,000	576	5,830	4,330	10,800
Chile	--	--	2,370	21,600	--	--	--	--	903	2,350
China	22	313	1,720	17,800	305	4,370	213	1,700	1,740	4,680
Finland	252	4,000	4,500	51,900	685	7,480	--	--	--	--
France	1	212	2,000	18,300	71	6,400	47	1,080	--	--
Germany	474	5,680	23,800	271,000	1,130	23,000	42	1,680	309	344
Hong Kong	--	--	312	2,730	1	24	2	26	40	100
India	--	--	216	1,580	38	820	74	2,120	1	7
Israel	--	--	9	194	354	4,400	--	--	20	68
Italy	1	29	81	792	7	224	27	357	11	99
Japan	53	669	1,010	17,100	238	5,150	1	65	260	534
Korea, Republic of	64	764	1,200	16,300	70	920	237	2,360	91	610
Luxembourg	--	--	910	14,500	--	--	--	--	--	--
Mexico	164	1,510	2,360	24,300	14,300	130,000	258	3,120	26,400	73,900
Peru	--	--	7,550	72,900	712	5,750	--	--	339	934
Russia	--	--	--	--	27,700	246,000	--	--	2,530	8,210
Sweden	--	--	5,650	60,000	23	225	(4)	9	--	--
Taiwan	(4)	3	245	2,810	157	966	10	392	1,600	4,570
Thailand	--	--	87	869	366	3,880	1,740	17,800	--	--
Turkey	--	--	--	--	25	251	8,220	83,400	--	--
United Kingdom	(4)	26	395	5,160	27	201	1	75	--	--
Other	38	476	2,850	26,100	262	5,950	109	1,530	16	49
Total	1,080	13,900	60,700	661,000	152,000	1,420,000	11,600	122,000	38,600	107,000

-- 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 2010 were 105,034 metric tons (t) valued at \$789 million, and in 2011, wire rod imports were 144,804 t valued at \$1,322 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			
	2010		2011		2010		2011	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Belgium	11,000	\$52,600	14,400	\$78,000	19,900	\$66,600	14,300	\$40,300
Canada	15,500	109,000	20,400	177,000	29,900	110,000	38,000	124,000
China	247,000	1,060,000	383,000	1,880,000	512,000	1,300,000	557,000	1,570,000
Germany	4,190	25,500	8,470	57,100	9,570	54,500	13,900	87,500
Hong Kong	10,300	53,500	5,970	31,100	44,500	158,000	29,000	126,000
India	965	5,960	1,690	10,300	17,900	40,700	12,200	42,200
Japan	7,180	48,600	8,810	62,300	9,900	58,500	7,480	52,100
Korea, Republic of	13,300	88,200	19,100	150,000	17,600	63,400	17,100	81,700
Mexico	4,090	25,400	3,150	24,100	7,090	49,900	7,000	45,400
Spain	2,890	20,400	5,170	41,000	8,630	29,500	11,600	42,800
Taiwan	2,940	17,000	4,170	22,500	2,790	8,500	3,400	9,660
Other	16,700	97,800	29,900	196,000	22,900	36,200	30,800	59,800
Total	334,000	1,590,000	501,000	2,710,000	699,000	1,960,000	739,000	2,280,000

<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 (metric tons)	Value <sup>2</sup> (thousands)	Gross weight (metric tons)	Copper content <sup>3</sup> (metric tons)	Value <sup>2</sup> (thousands)
2010	21,400	\$90,400	74,500	53,600	\$313,000
2011:					
Bahamas, The	344	1,870	685	493	1,570
Canada	14,600	105,000	34,800	25,100	181,000
Chile	39	357	403	290	1,880
China	--	--	426	307	2,790
Colombia	--	--	331	238	2,750
Costa Rica	834	4,020	2,300	1,650	13,600
Dominican Republic	1,250	2,230	1,860	1,340	4,830
El Salvador	731	1,820	1,250	900	3,820
Guatemala	666	1,620	1,960	1,410	10,100
Haiti	497	975	2	1	3
Honduras	47	208	1,060	763	5,790
Malaysia	--	--	746	537	4,850
Mexico	8,390	43,400	28,400	20,400	120,000
Nicaragua	1,080	2,790	968	697	2,140
Panama	--	--	649	647	3,780
Suriname	343	2,650	52	37	257
Other	1,580	4,330	3,580	2,400	22,300
Total	30,400	171,000	79,400	57,200	381,000

-- 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	2007	2008	2009	2010	2011
Argentina	180,200	156,893	143,084	140,318	116,829
Armenia	17,600 <sup>c</sup>	18,800	23,233 <sup>r</sup>	31,062 <sup>r</sup>	33,600 <sup>c</sup>
Australia: <sup>c</sup>					
Concentrates	828,000	833,000	831,000	856,000	922,300
Leaching, electrowon	42,000	53,000	23,000	14,400	35,600
Total	870,000	886,000	854,000	870,000	958,000
Bolivia	606	731	882	2,063	4,176
Botswana <sup>c</sup>	24,000	29,000	27,700	31,000	30,000
Brazil:					
Concentrates	205,728 <sup>r</sup>	218,295 <sup>r</sup>	211,692 <sup>r</sup>	213,548 <sup>r</sup>	213,600 <sup>p</sup>
Leaching, electrowon	900	3,800	6,500	7,400	7,450 <sup>p</sup>
Total	206,628 <sup>r</sup>	222,095 <sup>r</sup>	218,192 <sup>r</sup>	220,948 <sup>r</sup>	221,050 <sup>p</sup>
Bulgaria <sup>c</sup>	110,000	105,000	105,000	105,000	105,000
Burma, leaching, electrowon	13,900	--	3,500	12,000	12,000 <sup>c</sup>
Canada:					
Concentrates	594,749	605,399	493,700	522,000	565,200
Leaching, electrowon	1,500	1,600	800	3,000	1,000
Total	596,249	606,999	494,500	525,000	566,200
Chile: <sup>3</sup>					
Concentrates	3,724,900	3,356,600	3,276,900	3,330,400	3,238,000
Leaching, electrowon	1,832,100	1,971,000	2,117,500	2,088,200 <sup>r</sup>	2,024,800
Total	5,557,000	5,327,600	5,394,400	5,418,600 <sup>r</sup>	5,262,800
China: <sup>c</sup>					
Concentrates	928,000	1,070,000	1,040,000	1,160,000	1,270,000
Leaching, electrowon	18,000	20,000	25,000	35,000	35,000
Total	946,000	1,090,000	1,070,000	1,200,000	1,310,000
Colombia	1,050	1,310	1,420	1,000	1,000
Congo (Kinshasa): <sup>4</sup>					
Concentrates <sup>c</sup>	117,000 <sup>r</sup>	185,000 <sup>r</sup>	178,000 <sup>r</sup>	160,000 <sup>r</sup>	160,000
Leaching, electrowon	32,099	44,742	167,000 <sup>r</sup>	270,000 <sup>r</sup>	360,000 <sup>c</sup>
Total <sup>c</sup>	149,000 <sup>r</sup>	230,000 <sup>r</sup>	345,000 <sup>r</sup>	430,000 <sup>r</sup>	520,000
Cyprus, leaching, electrowon <sup>c</sup>	300	300	300	300	300
Dominican Republic	--	2,600	11,500	9,200	11,700
Finland	13,646	13,440	14,600	14,700	14,700
Georgia <sup>c</sup>	11,000	11,000	11,000	6,100	8,000
India	33,900	30,600	29,500	33,000	32,000
Indonesia <sup>4</sup>	796,900	632,600	998,530	878,376 <sup>r</sup>	543,000
Iran: <sup>c</sup>					
Concentrates	237,000 <sup>r</sup>	241,000	256,000 <sup>r</sup>	249,000 <sup>r</sup>	249,000
Leaching, electrowon	8,000	7,000 <sup>r</sup>	7,000	7,000	10,000
Total	245,000 <sup>r</sup>	248,000 <sup>r</sup>	263,000 <sup>r</sup>	256,000 <sup>r</sup>	259,000
Kazakhstan	440,000 <sup>r</sup>	465,000 <sup>r</sup>	455,000 <sup>r</sup>	427,000 <sup>r</sup>	417,000
Korea, North <sup>c</sup>	12,000	12,000	12,000	12,000	12,000
Korea, Republic of	6	4	14	9	10 <sup>c</sup>
Laos:					
Concentrates	--	24,929	54,019	67,806	60,000
Leaching, electrowon	62,541	64,075	67,561	64,241	79,000
Total	62,541	89,004	121,580	132,047	139,000
Macedonia	7,400	8,400	7,600	7,900	7,900 <sup>c</sup>
Mauritania	31,956	33,073	35,000	37,000	35,281
Mexico:					
Concentrates	276,530	214,644	170,597	190,136	307,600
Leaching, electrowon	58,972	53,975	57,151	80,000 <sup>c</sup>	136,000
Total	335,502	268,619	227,748	270,136	443,600
Mongolia	130,160	126,800	129,800	124,985 <sup>r</sup>	121,590
Morocco	5,572	5,600	11,800	11,200	12,000
Namibia	6,580	7,471	--	--	3,600 <sup>c</sup>
Pakistan	18,800	18,700	18,500	18,000	19,000

See footnotes at end of table.



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

(Metric tons)

Country	2007	2008	2009	2010	2011
Papua New Guinea	169,184	159,650	166,700	159,800	130,465
Peru:					
Concentrates	1,018,156	1,107,789	1,113,454 <sup>r</sup>	1,094,123 <sup>r</sup>	1,094,930
Leaching, electrowon	172,118	160,078	162,795 <sup>r</sup>	153,022 <sup>r</sup>	140,234
Total	1,190,274	1,267,867	1,276,249 <sup>r</sup>	1,247,145 <sup>r</sup>	1,235,164
Philippines	22,862	21,235	49,060	58,412	63,700
Poland	452,000	429,000	439,000	425,400	426,700
Portugal	90,247	89,504 <sup>r</sup>	86,500 <sup>r</sup>	74,426 <sup>r</sup>	82,200
Romania <sup>e,5</sup>	2,213 <sup>6</sup>	2,000	1,000	1,000	1,000
Russia <sup>e</sup>	740,000	750,000	676,000	703,000	713,000
Saudi Arabia	750 <sup>e</sup>	1,465	1,719 <sup>r</sup>	1,603 <sup>r</sup>	1,600 <sup>e</sup>
Serbia	16,500	18,800	19,000	19,000 <sup>e</sup>	29,300
South Africa	97,000	108,700	107,600	102,600	96,600
Spain:					
Concentrates	6,508 <sup>r</sup>	7,067 <sup>r</sup>	15,400	25,800 <sup>r</sup>	26,300
Leaching, electrowon	--	--	5,600	28,500 <sup>r</sup>	42,100
Total	6,508 <sup>r</sup>	7,067 <sup>r</sup>	21,000	54,300 <sup>r</sup>	68,400
Sweden	62,800	57,220	54,602	75,977	81,205
Tanzania, in concentrates and bullion	3,275	2,852	2,319	5,326	5,400 <sup>e</sup>
Turkey <sup>e,5</sup>	81,000	100,000	105,000	97,000	95,000
United States: <sup>4</sup>					
Concentrates	665,000	801,000	705,000	679,000	666,000
Leaching, electrowon	504,000	507,000	476,000	430,000	447,000
Total	1,170,000	1,310,000	1,180,000	1,110,000	1,110,000
Uzbekistan <sup>e</sup>	95,000	95,000	95,000	90,000	95,000
Vietnam	12,500	11,800	11,300	11,300	11,000
Zambia: <sup>e</sup>					
Concentrates	341,000	372,000 <sup>r</sup>	557,000	540,000	524,000
Leaching, electrowon	168,000	162,000 <sup>r</sup>	141,000 <sup>r</sup>	146,000 <sup>r</sup>	144,000
Total	509,000	534,000 <sup>r</sup>	698,000 <sup>r</sup>	686,000 <sup>r</sup>	668,000
Zimbabwe, concentrates	2,681	2,827	3,572	5,000 <sup>r,e</sup>	5,000 <sup>e</sup>
Grand total	15,500,000	15,600,000	16,000,000 <sup>r</sup>	16,100,000 <sup>r</sup>	16,100,000
Of which:					
Concentrates	12,600,000	12,600,000 <sup>r</sup>	12,800,000 <sup>r</sup>	12,800,000 <sup>r</sup>	12,700,000
Leaching, electrowon	2,910,000	3,050,000	3,260,000 <sup>r</sup>	3,340,000 <sup>r</sup>	3,470,000

<sup>e</sup>Estimated. <sup>p</sup>Preliminary. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>World 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>Table represents copper content by analysis of concentrates produced (includes cement copper, if applicable), except where otherwise noted. Table includes data available through July 28, 2012.

<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>Excludes copper content of pyrite.

<sup>6</sup>Reported figure.

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

(Metric tons, gross weight)

Country	2007	2008	2009	2010	2011
Armenia, primary	6,954	6,480	6,858	7,644 <sup>r</sup>	8,000 <sup>c</sup>
Australia, primary	399,000	449,000	422,000	410,000	442,000
Austria, secondary	80,200	94,200	90,800	92,200	92,200 <sup>p</sup>
Belgium, secondary	115,000 <sup>c</sup>	124,500	114,400	118,600	112,900
Botswana, primary <sup>3</sup>	19,996	23,146	24,382	24,000 <sup>c</sup>	16,100
<b>Brazil:</b>					
Primary	178,380 <sup>r</sup>	191,008 <sup>r</sup>	193,899 <sup>r</sup>	177,800 <sup>r</sup>	178,000 <sup>p</sup>
Secondary <sup>c</sup>	40,000	39,000 <sup>r</sup>	31,000	47,700	48,000 <sup>p</sup>
Total	218,380 <sup>r</sup>	230,008 <sup>r</sup>	224,899 <sup>r</sup>	225,500 <sup>r</sup>	226,000 <sup>p</sup>
<b>Bulgaria:</b>					
Primary	217,600	257,100	256,200	265,000	265,000 <sup>c</sup>
Secondary <sup>c</sup>	11,500	21,200	20,000	19,600	23,000
Total	229,100	278,300	276,200	284,600	288,000 <sup>c</sup>
<b>Canada:</b>					
Primary	470,713	443,798	316,510	318,000	305,000 <sup>p</sup>
Secondary	46,101	41,777	29,733	31,800	25,000 <sup>p</sup>
Total	516,814	485,575	346,243	349,800	330,000 <sup>p</sup>
Chile, primary	1,514,300	1,369,200	1,522,300	1,559,800	1,364,200
<b>China:<sup>c</sup></b>					
Primary	2,110,000	2,500,000	2,700,000	2,800,000	3,100,000
Secondary	800,000	870,000	1,100,000	1,300,000	1,600,000
Total	2,910,000	3,370,000	3,800,000	4,100,000	4,700,000
Congo (Kinshasa), primary, electrowon	1,800	--	--	--	--
<b>Finland:</b>					
Primary	141,000	172,354	137,710	149,000 <sup>c</sup>	156,000 <sup>c</sup>
Secondary <sup>c</sup>	2,000	2,000	2,000	2,000	2,000
Total	143,000	174,354	139,710	151,000 <sup>c</sup>	158,000 <sup>c</sup>
<b>Germany:</b>					
Primary	270,200	295,000	286,300	378,700	346,200 <sup>p</sup>
Secondary	273,400	293,300	247,500	212,400	218,000 <sup>p</sup>
Total	543,600	588,300	533,800	591,100	564,200 <sup>p</sup>
<b>India:</b>					
Primary	700,000	651,000	705,100	654,000	670,000
Secondary <sup>c</sup>	15,000	11,000	10,000	9,000 <sup>r</sup>	7,000
Total	715,000	662,000	715,100	663,000 <sup>r</sup>	677,000
Indonesia, primary	277,100	253,300	295,900	276,800	280,000
<b>Iran:<sup>c,4</sup></b>					
Primary	180,000	180,000	193,000	190,000	185,000
Secondary	70,000	68,000	67,000	91,000 <sup>r</sup>	85,000
Total	250,000	248,000	260,000	281,000 <sup>r</sup>	270,000
<b>Japan:</b>					
Primary	1,367,310	1,366,310	1,297,943	1,382,700	1,168,284
Secondary	245,208	259,060	243,859	260,200	269,748
Total	1,612,518	1,625,370	1,541,802	1,642,900	1,438,032
Kazakhstan, undifferentiated	392,834	392,575	332,854 <sup>r</sup>	318,637 <sup>r</sup>	320,000 <sup>c</sup>
Korea, North, undifferentiated <sup>c</sup>	15,000	15,000	15,000	15,000	15,000
<b>Korea, Republic of:</b>					
Primary <sup>c</sup>	470,000	502,000	455,000	476,000	449,000
Secondary <sup>c</sup>	45,000	42,000	44,200 <sup>r</sup>	65,200 <sup>r</sup>	90,000
Total	515,000	544,000	499,200 <sup>r</sup>	541,200 <sup>r</sup>	539,000
<b>Mexico:</b>					
Primary	222,600	200,200	153,700	117,400 <sup>r</sup>	160,000
Secondary <sup>c</sup>	5,000	5,000	5,000	5,000	5,000
Total	227,600	205,200	158,700	122,400 <sup>r</sup>	165,000
Namibia, primary	20,600 <sup>r,c</sup>	16,271	21,543 <sup>r</sup>	31,900 <sup>r</sup>	43,800 <sup>c</sup>
Oman, primary	13,940	11,906	12,000 <sup>c</sup>	14,000	14,000 <sup>c</sup>

See footnotes at end of table.

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

(Metric tons, gross weight)

Country	2007	2008	2009	2010	2011
Pakistan, primary <sup>c</sup>	18,200	17,800	17,500	17,000	16,500
Peru, primary	236,809 <sup>r</sup>	306,584 <sup>r</sup>	325,782 <sup>r</sup>	312,968	299,004
Philippines, primary	220,000	239,700	230,100	216,200	205,000
Poland:					
Primary	438,100	438,600	427,800	452,200 <sup>r</sup>	449,000
Secondary	39,800 <sup>r</sup>	43,800 <sup>r</sup>	68,800	94,300 <sup>r</sup>	88,700
Total	477,900 <sup>r</sup>	482,400 <sup>r</sup>	496,600	546,500 <sup>r</sup>	537,700
Russia: <sup>c</sup>					
Primary	650,000	630,000	580,000	590,000	600,000
Secondary	290,000	235,000	220,000	240,000	250,000
Total	940,000	865,000	800,000	830,000	850,000
Serbia: <sup>c</sup>					
Primary	30,200	31,900	27,000 <sup>r</sup>	20,000 <sup>r</sup>	31,900
Secondary	1,000	1,000	1,000	1,000	1,000
Total	31,200	32,900	28,000 <sup>r</sup>	21,000 <sup>r</sup>	32,900
Slovakia, secondary	20,600 <sup>e</sup>	27,500	34,200	46,500	48,800
South Africa, primary	111,900	94,800	86,900	75,900	82,000 <sup>e</sup>
Spain:					
Primary	258,291 <sup>r</sup>	259,900 <sup>r</sup>	260,000 <sup>r</sup>	236,000 <sup>r</sup>	231,300
Secondary <sup>c</sup>	10,000 <sup>r</sup>	10,000 <sup>r</sup>	10,000 <sup>r</sup>	19,000 <sup>r</sup>	21,700
Total	268,291 <sup>r</sup>	269,900 <sup>r</sup>	270,000 <sup>r</sup>	255,000 <sup>r</sup>	253,000
Sweden:					
Primary	132,500	128,500	126,000	137,000	155,000
Secondary <sup>c</sup>	46,500	53,800	39,600	42,000	44,000
Total	179,000	182,300	165,600	179,000	199,000
Thailand:					
Primary	11,900	--	--	--	--
Secondary	814	438 <sup>r</sup>	490 <sup>r</sup>	490 <sup>r</sup>	500 <sup>e</sup>
Total	12,714	438 <sup>r</sup>	490 <sup>r</sup>	490 <sup>r</sup>	500 <sup>e</sup>
Turkey, undifferentiated <sup>c, 5</sup>	30,000	35,000	30,000	30,000	30,000
United States, undifferentiated	617,000	574,000	597,000	601,000	538,000
Uzbekistan, undifferentiated <sup>c</sup>	92,000	92,000	92,000	92,000	92,000
Vietnam, primary <sup>c</sup>	11,000 <sup>6</sup>	2,200	6,000	8,000	8,000
Zambia, primary	224,000	232,000 <sup>e</sup>	334,000	490,000	511,000
Grand total:	14,200,000 <sup>r</sup>	14,600,000 <sup>r</sup>	14,900,000 <sup>r</sup>	15,500,000 <sup>r</sup>	15,800,000
Of which					
Primary:					
Electrowon	1,800	--	--	--	--
Other	10,900,000 <sup>r</sup>	11,300,000	11,400,000	11,800,000	11,700,000
Secondary	2,160,000 <sup>r</sup>	2,240,000 <sup>r</sup>	2,380,000 <sup>r</sup>	2,700,000 <sup>r</sup>	3,030,000
Undifferentiated	1,150,000	1,110,000	1,070,000 <sup>r</sup>	1,060,000 <sup>r</sup>	995,000

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

<sup>1</sup>World 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>This table 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. Table includes data available through July 28, 2012.

<sup>3</sup>Copper content of nickel-copper matte exported to Norway for refining.

<sup>4</sup>Data are for year beginning March 21 of that stated.

<sup>5</sup>Secondary production is estimated to be about one-third of total.

<sup>6</sup>Reported figure.

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

	(Metric tons)				
Country	2007	2008	2009	2010	2011
Argentina, secondary <sup>c</sup>	16,000	16,000	16,000	16,000	16,000
Australia, primary:					
Electrowon	42,000	53,000	23,000	14,400 <sup>r</sup>	35,600
Other	400,000	450,000	423,000	410,000 <sup>r</sup>	441,200
Total	442,000	503,000	446,000	424,400 <sup>r</sup>	476,800
Austria, secondary	81,400	106,700	96,200	113,700	112,500
Belgium:					
Primary <sup>3</sup>	228,500	233,100	220,600	216,000	226,200
Secondary	165,600	162,700	153,100	165,000	168,000
Total	394,100	395,800	373,700	381,000	394,200
Brazil:					
Primary:					
Electrowon	900	3,800	6,500	7,400	4,300 <sup>p</sup>
Other	178,380 <sup>r</sup>	191,008 <sup>r</sup>	193,899	177,800	173,500 <sup>p</sup>
Total	179,280 <sup>r</sup>	194,808 <sup>r</sup>	200,399	185,200	177,800 <sup>p</sup>
Secondary	40,000 <sup>r</sup>	39,000 <sup>r</sup>	31,000	47,700	50,400 <sup>p</sup>
Total, primary and secondary	219,280 <sup>r</sup>	233,808 <sup>r</sup>	231,399	232,900	228,200 <sup>p</sup>
Bulgaria:					
Primary	64,400	114,200	183,600	195,400	201,500
Secondary <sup>c</sup>	5,700	12,600	13,200	19,600	25,000
Total <sup>c</sup>	70,100	127,000	197,000	215,000	227,000
Burma, primary, electrowon	13,900 <sup>r</sup>	--	3,500 <sup>r</sup>	12,000 <sup>e</sup>	12,000 <sup>e</sup>
Canada:					
Primary:					
Electrowon	1,500	1,600	800	3,200	1,000
Other	405,500	398,400	304,496	283,700	247,000
Total	407,000	400,000	305,296	286,900	248,000
Secondary	46,000	42,000	30,600	32,000	25,800
Total, primary and secondary	858,500	840,400	640,392	602,600	520,800
Chile, primary:					
Electrowon	1,832,100	1,971,000	2,117,500	2,088,500	2,024,800
Other	1,104,400	1,086,600	1,159,100	1,155,400	1,067,600
Total	2,936,500	3,057,600	3,276,600	3,243,900	3,092,400
China: <sup>c</sup>					
Primary:					
Electrowon	18,200 <sup>r</sup>	16,600 <sup>r</sup>	17,000	24,000 <sup>r</sup>	30,000
Other	2,280,000	2,680,000	2,750,000	2,950,000	3,390,000
Total	2,300,000 <sup>r</sup>	2,700,000 <sup>r</sup>	2,770,000	2,970,000 <sup>r</sup>	3,420,000
Secondary	1,200,000	1,200,000	1,400,000	1,700,000	1,850,000
Total, primary and secondary	3,500,000 <sup>r</sup>	3,900,000 <sup>r</sup>	4,170,000	4,670,000 <sup>r</sup>	5,270,000
Congo (Kinshasa), primary, electrowon	6,697 <sup>r</sup>	38,632	166,917 <sup>r</sup>	262,401 <sup>r</sup>	355,000 <sup>e</sup>
Cyprus, primary, electrowon	2,900	2,986	2,380	2,400 <sup>e</sup>	2,400 <sup>e</sup>
Egypt, secondary	2,664	2,842	3,000	3,000 <sup>e</sup>	3,000 <sup>e</sup>
Finland:					
Primary	100,987	127,952	95,549	108,700 <sup>r</sup>	107,600
Secondary <sup>c</sup>	10,000	10,000	10,000	4,000 <sup>r</sup>	9,000
Total <sup>c</sup>	111,000	138,000	106,000	113,000 <sup>r</sup>	117,000
Germany:					
Primary	301,702	300,470	290,200	401,900 <sup>r</sup>	401,200 <sup>p</sup>
Secondary	363,815	389,300	378,745	302,400 <sup>r</sup>	308,000 <sup>p</sup>
Total	665,517	689,770	668,945	704,300 <sup>r</sup>	709,200 <sup>p</sup>
Hungary, secondary <sup>c</sup>	10,000	--	--	--	--
India:					
Primary, electrolytic	698,600	654,200	705,100	654,900	671,100
Secondary <sup>c</sup>	15,000	15,000	10,000	9,000 <sup>r</sup>	2,000
Total <sup>c</sup>	714,000	669,000	715,000	664,000 <sup>r</sup>	673,000
Indonesia, primary	277,000	254,000	289,200	278,200	257,000

See footnotes at end of table.



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

	(Metric tons)				
Country	2007	2008	2009	2010	2011
<b>Iran:</b>					
Primary: <sup>c</sup>					
Electrowon	8,000	7,000	7,000	7,000	10,000
Other	145,000 <sup>r</sup>	140,000	150,000	143,000	149,000
Total	153,000 <sup>r</sup>	147,000	157,000	150,000	159,000
Secondary					
Total, primary and secondary	208,000 <sup>r</sup>	200,000	210,000	220,000	227,000
Italy, secondary <sup>c</sup>	28,600 <sup>4</sup>	24,200	6,500	2,000 <sup>r</sup>	2,000
<b>Japan:</b>					
Primary	1,369,814	1,328,157	1,238,012	1,333,800	1,094,400
Secondary	207,004	211,681	201,831	214,900	233,238
Total	1,576,818	1,539,838	1,439,843	1,548,700	1,327,638
Kazakhstan, primary	406,800 <sup>r</sup>	398,411	312,767 <sup>r</sup>	323,368 <sup>r</sup>	338,346
Korea, North, primary <sup>c</sup>	15,000	15,000	15,000	15,000	15,000
Korea, Republic of:					
Primary	536,467	496,325 <sup>r</sup>	490,601 <sup>r</sup>	520,900 <sup>r</sup>	549,347
Secondary	45,000	41,600 <sup>r</sup>	41,100 <sup>r</sup>	43,700 <sup>r</sup>	46,100
Total	581,467	537,925	531,701	564,600	595,447
Laos, primary, electrowon	62,541	64,075	67,561	64,241	78,900
<b>Mexico:</b>					
Primary:					
Electrowon	107,000	74,500	65,700	85,600 <sup>r</sup>	136,000 <sup>c</sup>
Other	238,900	215,500	190,000	156,600 <sup>r</sup>	259,200 <sup>c</sup>
Total	345,900	290,000	256,000	242,200 <sup>r</sup>	395,000 <sup>c</sup>
Secondary <sup>c</sup>					
Total, primary and secondary <sup>c</sup>	352,000	296,000	261,000	247,000 <sup>r</sup>	400,000
Mongolia, primary, electrowon	3,007	2,587	2,470	2,750	2,390
Norway, primary <sup>c,5</sup>	43,000 <sup>4</sup>	32,000 <sup>4</sup>	30,000	40,000 <sup>r</sup>	40,000
Oman, primary <sup>c</sup>	14,000	12,000	12,000	14,000	14,000
<b>Peru, primary:</b>					
Electrowon	172,118	160,078	162,795 <sup>r</sup>	153,022	140,234
Other	241,789	303,855	260,618 <sup>r</sup>	240,616	227,320
Total	413,907	463,933	423,413 <sup>r</sup>	393,638	367,554
Philippines, primary	160,200	174,600	178,000	176,000 <sup>r</sup>	164,000
<b>Poland:</b>					
Primary	493,200	483,000	433,600	452,700	481,800
Secondary	39,800	43,800	68,800	94,300	89,000
Total	533,000	526,800	502,400	547,000	570,800
<b>Romania:</b>					
Primary	15,584	10,323	3,000	3,000 <sup>c</sup>	3,000 <sup>c</sup>
Secondary <sup>c</sup>	3,000	3,000	1,000	1,000	1,000
Total <sup>c</sup>	18,600	13,300	4,000	4,000	4,000
<b>Russia:</b>					
Primary	650,000	610,000	612,000	656,000	660,000 <sup>c</sup>
Secondary	289,000	250,000	250,000	218,000	230,000 <sup>c</sup>
Total	939,000	860,000	862,000	874,000	890,000 <sup>c</sup>
<b>Serbia:</b>					
Primary	30,600	32,800	27,000 <sup>r</sup>	20,000 <sup>r</sup>	28,300
Secondary <sup>c</sup>	1,000	1,000	1,000	1,000	1,000
Total <sup>c</sup>	31,600	33,800	28,000 <sup>r</sup>	21,000 <sup>r</sup>	29,300
South Africa, primary <sup>5</sup>	113,166	92,972	89,453 <sup>r</sup>	81,129 <sup>r</sup>	80,000 <sup>c</sup>

See footnotes at end of table.

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

	(Metric tons)				
Country	2007	2008	2009	2010	2011
<b>Spain:</b>					
Primary:					
Electrowon	--	--	5,600	28,500	42,100 <sup>e</sup>
Other	243,000	257,000	250,200	236,000	225,700 <sup>p</sup>
Total	243,000	257,000	255,800	264,500	268,000 <sup>e</sup>
Secondary <sup>c</sup>					
Total, primary and secondary <sup>c</sup>	308,000	319,000	329,000	347,000	354,000
<b>Sweden:</b>					
Primary	175,500	184,674	164,759	150,497	179,316
Secondary	38,500	43,100	41,000	40,000 <sup>e</sup>	40,000 <sup>e</sup>
Total	214,000	227,774	205,759	190,000 <sup>e</sup>	219,000 <sup>e</sup>
Taiwan, secondary <sup>c</sup>	4,500	4,500	4,500	4,500	4,500
<b>Thailand:</b>					
Primary	11,900	--	--	--	--
Secondary	814	438	490	490 <sup>r</sup>	500 <sup>e</sup>
Total	12,714	438	490	490 <sup>r</sup>	500 <sup>e</sup>
<b>Turkey:<sup>e</sup></b>					
Primary	94,600	83,000	30,000	50,000	80,000
Secondary	5,000	5,000	4,000	5,000	5,000
Total	99,600	88,000	34,000	55,000	85,000
Ukraine, secondary <sup>c</sup>	20,000	20,000	20,000	20,000	20,000
<b>United States:</b>					
Primary:					
Electrowon	504,000	507,000	476,000	430,000	447,000
Other	764,000	713,000	636,000	627,000	545,000
Total	1,270,000	1,220,000	1,110,000	1,060,000	992,000
Secondary					
Total, primary and secondary	1,320,000	1,270,000	1,160,000	1,100,000	1,030,000
Uzbekistan, primary	89,655	71,000	80,000	90,000	90,000 <sup>e</sup>
Vietnam, primary <sup>c</sup>	11,000 <sup>r,4</sup>	2,200 <sup>r,4</sup>	6,000	8,000 <sup>r</sup>	8,000
<b>Zambia, primary:<sup>c</sup></b>					
Electrowon <sup>6</sup>	200,000	175,000	145,400 <sup>4</sup>	160,000	146,000
Other	230,000	240,000	269,000 <sup>4</sup>	370,000	370,000
Total	430,000	415,000	414,400 <sup>4</sup>	530,000	516,000
Zimbabwe, primary <sup>c</sup>	6,798 <sup>4</sup>	3,072 <sup>4</sup>	3,000	5,000	5,000
Grand total	17,900,000	18,300,000	18,300,000 <sup>r</sup>	19,100,000	19,700,000
Of which:					
Primary:					
Electrowon	2,980,000	3,080,000	3,270,000 <sup>r</sup>	3,350,000 <sup>r</sup>	3,470,000
Other	12,100,000	12,400,000	12,100,000	12,500,000	12,800,000
Total	15,100,000	15,500,000	15,400,000	15,900,000 <sup>r</sup>	16,300,000
Secondary					
	2,810,000 <sup>r</sup>	2,820,000 <sup>r</sup>	2,960,000 <sup>r</sup>	3,250,000 <sup>r</sup>	3,440,000

<sup>e</sup>Estimated. <sup>p</sup>Preliminary. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>World 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>This table 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. Table includes data available through July 28, 2012.

<sup>3</sup>Includes reprocessed leach cathode from Congo (Kinshasa).

<sup>4</sup>Reported figure.

<sup>5</sup>May include secondary.

<sup>6</sup>Electrowon covers only high-grade electrowon cathodes reported as "finished production leach cathodes."