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# 2010 Minerals Yearbook

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In the United States, mine production of recoverable copper declined for the second consecutive year, decreasing by about 70,000 metric tons (t) to 1.10 million metric tons (Mt), and was down by almost 200,000 t from production in 2008. Although production declined slightly in Arizona and New Mexico as a result of curtailments following the collapse of copper prices during the fourth quarter of 2008, most of the decline was attributed to Utah, where lower ore grades at the leading U.S. copper producer led to a sharp decrease in production.

Despite numerous announced expansions in global mine capacity that totaled about 400,000 metric tons per year (t/yr), lower capacity utilization, particularly in the United States, resulted in a global copper mine production increase of only about 100,000 t compared with that in 2009. In addition to lower copper prices, numerous factors, including labor and political unrest, lower ore grades, technical problems, and utility shortages, continued to plague the industry and sustain a downward trend in capacity utilization. According to data compiled by the International Copper Study Group (ICSG), global mine capacity utilization has fallen to about 80% in 2010 from about 87% in 2006 (International Copper Study Group, 2011a, p. 9).

The United States fell from being the third ranked to the fourth ranked mine producer of copper behind Chile, Peru, and China and accounted for about 7% of global production. Chile remained the leading world mined copper producer, and accounted for 34% of global production. Global smelter production, which had declined nominally in 2009, rose by about 4% in 2010, as did downstream refinery production, owing to increased availability of scrap and copper concentrates. The United States ranked sixth in world smelter production and remained fourth in refinery output behind China, Chile, and Japan.

According to data compiled by the ICSG (2011a, p. 19–20), global consumption of refined copper, which had risen nominally (70,000 t) in 2009, rose by 7% (1.3 Mt) in 2010. In 2009, consumption declines in Europe, North America, and most major consuming regions of Asia were more than offset by an astronomical growth of almost 2 Mt (37%) in China's apparent 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 and were thought to have accumulated during 2009. In 2010, consumption in Europe and North America partially recovered from the 2009 downturn, increasing by 9% and 10%, respectively, although remaining below prerecession levels. In Asia, consumption rose by about 6% to a record-high level despite a more modest increase of more than 4% in China's apparent consumption.

In a reversal of the previous 2 years market balance, global production of refined copper in 2010 was insufficient to meet demand, and reported yearend 2010 global inventories of refined copper declined by about 145,000 t from those at yearend 2009 but remained at about 130,000 t above yearend 2008 inventories. The decline in global inventories took place despite a decline in China's imports of refined copper, which declined to 2.92 Mt in 2010 from 3.19 Mt in 2009 (International Copper Study Group, 2011a, p. 21, 29).

Copper prices during the first 8 months of 2010 fluctuated significantly. The daily COMEX price began 2010 at $3.39 per pound, ranged between $2.76 per pound (June 7) and $3.61 per pound (April 14), and averaged $3.23 per pound during the 8-month period, close to the December 2009 average of $3.19 per pound. Prices began a sustained rise in September with the yearend COMEX price rising to $4.44 per pound, the highest level of the year, and averaging $4.23 per pound in December and $3.43 for the full year, up from the 2009 average of $2.35 per pound.

The principal mining States for copper, in descending order of production, were Arizona, Utah, Nevada, New Mexico, and Montana, accounting for more than 99% of domestic production; copper was also recovered at mines in Idaho and Missouri. Although copper was recovered at 29 mines in the United States during 2010, 18 mines accounted for more than 99% of production (table 2). The remaining mines were either small leach operations or byproduct producers of copper.

In 2010, copper recovered from refined or remelted scrap (about 83% from new scrap and 17% from old scrap) composed 32% of the total U.S. copper supply. The conversion of old scrap to alloys and refined copper continued a downward trend and declined by 5% to 131,000 t of recoverable 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.

## Legislation and Government Programs

On November 22, the International Trade Administration (ITA), U.S. Department of Commerce, published its final determination that an industry within the United States was being threatened with material injury from the import and sales of copper pipe and tube from China and Mexico at less than their fair market value. 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. The orders applied to all seamless circular refined copper pipes and tubes greater than or equal to 6 inches [152.4 millimeters (mm)] in length and measuring less than 12.130 inches (308.102 mm) in outside diameter regardless of wall thickness, bore finish, manufacturing

process, outer surface or end finish, coating or insulation, end fitting, or physical configuration (straight, coiled, bent, etc.) (U.S. Department of Commerce, 2010b).

In December, three of the sanctioned Mexican tube exporters and their United States affiliates, along with the Government of Mexico, filed a request for a panel review with the United States section of the North American Free Trade Agreement (NAFTA) Secretariat. Chapter 19 of NAFTA provides a mechanism to request an independent binational panel to review final antidumping and countervailing duty in cases involving imports from a NAFTA country. When such a request is filed, a panel is established to act in place of national courts to expedite review of the final determination to see if it conforms with the antidumping or countervailing duty law of the country that made the determination (U.S. Department of Commerce, 2010a).

## Production

Domestic mine production of copper decreased by about 6%, or about 70,000 t, to its lowest level since 1985, owing to closures and cutbacks announced during the fourth quarter of 2008 in response to the onset of a global recession and the plummet in copper prices. Estimated mine capacity, however, rose by about 30,000 t/yr to 1.73 million metric tons per year (Mt/yr), and as a result, capacity utilization declined to 64% from about 69% in 2009 and was at its lowest level in more than 25 years. Smelter production, however, remained unchanged as much of the decrease came from lower electrowon production, and exports of copper in concentrate declined. Downstream, electrolytic refined production declined by about 9,000 t, as permanent closure of the White Pine, MI, refinery in August, which had processed anodes imported from Canada, was partially offset by lower exports of domestically produced anode and increased production at the remaining three electrolytic refiners. Electrowon copper from leach solutions accounted for 39% and 41%, respectively, of mine and refinery production. Fifteen solvent extraction-electrowinning (SX-EW) facilities operated during 2010.

***Operating Property Reviews.***—Consolidated full-year production for ASARCO LLC's (Phoenix, AZ) mines in Arizona in 2010 totaled 209,000 t, an increase of about 13% from that in 2009, primarily owing to higher ore grades at the Mission and Ray Mines and improved recoveries at the Ray Mine. The Hayden smelter in Arizona produced 159,000 t of anode. Asarco produced 217,000 t of electrolytic copper, 158,000 t at its electrolytic refinery in Amarillo, TX, and a combined 59,000 t from its electrowinning operations at the Ray and Silver Bell Mines (Grupo México, S.A.B. de C.V., 2011, p. 29, 128).

Copper production from BHP Billiton's (Melbourne, Australia, and London, United Kingdom) residual Arizona leach operations at Miami and Pinto Valley remained unchanged at 6,000 t. Production of copper concentrate at Pinto Valley remained suspended (BHP Billiton, 2011, p. 2).

In late 2008 and early 2009, in response to the decline in copper and molybdenum prices, Freeport-McMoRan Copper & Gold Inc. (FCX) announced revised production plans that included cessation of mining at its Chino Mine in New Mexico; suspension of restart of mining at its residual leach operation in Miami, AZ; and about a 50% reduction in the operating rates at its Morenci and Safford Mines in Arizona and its Tyrone Mine in New Mexico. As a result, mine production at FCX's U.S. operations declined for the second consecutive year, falling by about 6% to 514,000 t from 554,000 t in 2009 and 691,000 t in 2008. Total unit costs, discounted for byproduct credit and including depreciation and other noncash costs, rose to $1.60 per pound of copper in 2010 from $1.44 per pound in 2009, despite an increase in byproduct credits to $0.35 per pound of copper from $0.23 in 2009 (Freeport-McMoRan Copper & Gold Inc., 2011a. p. 6–9, 23, 84).

In the first quarter of 2010, however, FCX restarted the Morenci mill to process available sulfide material and initiated a staged ramp up of the mining rate to 635,000 t/d from 450,000 t/d, with the goal of increasing its annual production rate by 57,000 t by the beginning of 2011. Mill throughput during the fourth quarter averaged 42,200 t/d of ore, up from 30,000 t/d at restart, and was expected to reach 50,000 t/d during 2011. Combined production (concentrate and electrowon) rose nominally in 2010 to 228,000 t. Although 2010 production at the Chino Mine of 15,400 t and the Miami Mine of 8,200 t came from residual leach during 2010, by the first quarter of 2010, FCX had initiated restart of mining at both operations. At Chino, FCX was investing $150 million in the mine and mill with targeted incremental production of 45,000 t in 2012 and 90,000 t in 2013, and at Miami, FCX expected to expend $40 million to increase production to 45,000 t/yr of copper cathode by late 2011 (Freeport-McMoRan Copper & Gold Inc., 2010, p. 4–5; 2011b, p. 3–4).

At FCX's Bagdad Mine in Arizona, copper production (concentrate and electrowon) declined to 92,000 t in 2010 from 102,000 t in 2009; at its Sierrita Mine in Arizona, production (concentrate and limited electrowon) decreased to 67,000 t from 77,000 t in 2009; and at its Tyrone Mine, production declined to 37,000 t from 39,000 t in 2009. At the Safford Mine, electrowon production decreased to 65,000 t from 83,000 t in 2009, and at yearend, construction of a $150 million sulfur burner to reduce the cost of sulfuric acid was underway and was expected to be completed in the second quarter of 2011 (Freeport-McMoRan Copper & Gold Inc., 2011a, p. 23, 82–83).

In 2010, despite a production decline to 250,000 t from 303,500 t in 2009, the Bingham Canyon Mine in Utah retained the position it regained in 2009 as the leading U.S. copper mine producer. Although the Copperton concentrator recorded record ore throughput, average copper head grades declined to 0.53% from 0.64% in 2009. Average molybdenum grades, however, increased to 0.045% from 0.038% in 2009, and molybdenum production increased to 12,900 t from 11,300 t. Production of refined copper decreased by about 2% to 269,000 t from 274,000 t in 2009. During 2010, 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 process (Rio Tinto plc, 2011, p. 3, 12, 22).

The Lisbon Valley Mine in Utah, formerly operated by bankrupt Constellation Copper Corp. (Denver, CO), was recapitalized, exited bankruptcy operating as Lisbon Valley Mining Co. LLC, and resumed mining and placement of new ore on leach pads. Production was expected to rise to about

8,200 t/yr of electrowon copper. Mining had ceased during the first quarter of 2008, and production had been from residual leach (Lisbon Valley Mining Co. LLC, 2010).

In 2010, following the completion of a phase I, 23,000-t/d mill during 2009, the Mineral Park Mine (Arizona) produced 14,600 t of copper (1,430 t from electrowinning) and 1,970 t of molybdenum. In February, Mercator Minerals Ltd. (Kingman, AZ, and Vancouver) began startup of its of phase 1.5 expansion to increase mill capacity to 27,000 t/d. Mill throughput during 2010 averaged 23,900 t/d. Mercator was proceeding with its phase 2 expansion that was expected to boost mill capacity to 45,000 t/yr during 2012 and in 2010, purchased a gas turbine to generate the additional power the expanded mill would require. Yearend mill reserves totaled 418 Mt, grading an average of 0.377% copper and containing 529,000 t of copper, and leach reserves totaled 67 Mt grading 0.07% copper and containing 47,000 t of copper (Mercator Minerals Ltd., p. 8–9, 26).

In July, 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 geological and engineering studies prior to installation of a new leach pad. Leaching of residual copper from stockpiles continued. In January 2008, it had produced its first cathode since August 2003 from the leaching of stockpiles and in February 2009, it had resumed mining. Sales of copper cathode rose to 4,120 t in 2010 from 3,670 t in 2009, but following suspension of mining, sales in the fourth quarter fell to 697 t from 1,280 t in the fourth quarter of 2009 (Nord Resources Corp., 2011, p. 2–3).

On May 15, Quadra Mining Ltd. (Vancouver) merged with FNX Mining Co. Inc. (Toronto, Ontario, Canada) to become Quadra FNX Mining Co. with headquarters retained in Vancouver. FNX primarily held properties in the Sudbury mining district in Canada, including the McCreedy West and Levack Mines. Production at Quadra's Robinson Mine in Nevada decreased to 49,400 t from 55,600 t in 2009 owing to lower mill throughput from harder ore mined at the bottom of the Veteran pit. During the fourth quarter of the year, a shift in production from the Veteran and Ruth pits to just the Ruth pit was completed. At its Carlota Mine in Nevada, which produced its first cathode in December 2008, production of electrowon copper rose to 14,500 t from 12,700 t in 2009 but was lower than anticipated owing to heavy rains in both January and December (Quadra FNX Mining Ltd., 2011a, p. 1–8; b).

***Developing Property Reviews.***—Augusta Resource Corp. (Vancouver, British Columbia, Canada) continued development and permitting of the Rosemont Mine, about 50 kilometers southeast of Tucson, AZ. During 2010, it entered into several financial arrangements for mine development including a $176 million "earn-in agreement" with a South Korean consortium comprising the state-owned Korea Resources Corp. (Seoul, Korea) and LG International Corp. (Seoul) to acquire a 20% share in Rosemont. In November, Augusta delivered a full draft environmental impact statement (EIS) to the U.S. Forest Service, and in April 2011, the U.S. Forest Service announced its intent to issue a final decision in January 2012. Augusta anticipated building a 68,000-metric-ton-per-day (t/d) mill for sulfide ore and a heap-leach SX-EW facility with combined annual production of 100,000 t/yr of copper (Augusta Resource Corp., 2010a, b; 2011).

In February, Curis Resources Ltd. (Vancouver) acquired the assets, including permits, of the Florence Copper Project in Arizona from Merrill Ranch Investments LLC (Scottsdale, AZ, and Atlanta, GA). Prior to deferring development in 2000 and then divesting itself of the property, BHP Copper Co. had completed a prefeasibility study and obtained major environmental permits for an in situ leach copper operation. In October 2010, Curis announced a positive preliminary feasibility study, based on a base case of producing 35,000 t/yr of electrowon copper during a 19-year mine life, and was proceeding with amending and updating its operating permits with a goal of initiating copper production in 2012 (Curis Resources Ltd., 2010).

Formation Metals Inc. (Vancouver) was proceeding with its development of the underground Idaho Cobalt Project that was projected to produce about 2,000 t/yr of copper as a byproduct of cobalt production. In January, Formation announced that it had engaged JDS Energy and Mining Inc. to manage engineering and construction of the project, and in April, it announced that it had completed clearing of the mine site in preparation for constructing mine buildings and tailings disposal sites. As of April 2011, the company was pilot testing the hydrometalurgical complex, engaged in various engineering studies to update and complete the final complex design and equipment procurement, and was anticipating startup of construction during the second quarter of 2011 (Formation Metals Inc., 2010; 2011).

In 2010, Mines Management, Inc. (Spokane, WA) completed a preliminary economic assessment of its Montanore silver-copper project in northwestern Montana. The assessment was based on an average ore grade of 0.72% copper and 64 grams per metric ton (g/t) silver and production of 23,200 t/yr copper and 200 t/yr silver. The company was working to update lapsed environmental permits received prior to abandonment of the project in 2002 by its previous owner, Noranda Minerals Corp. During 2010, Mines Management responded to comments on its draft EIS released in 2009. The project hosts one of the world's largest known silver-copper deposits, with estimated resources containing more than 7,000 t of silver and nearly 780,000 t of copper (Mines Management, Inc., 2011, p. 5–8).

The Pebble Limited Partnership (Anchorage, AK), an equal partnership between Anglo American plc (London) and Northern Dynasty Minerals Ltd. (Vancouver), allocated more than $73 million for advancement of the Pebble project in southwest Alaska during 2010, increasing the amount invested in the project to about $500 million. An updated mineral resource assessment released in February increased estimates of contained copper, gold, and molybdenum by 12%, 14%, and 16%, respectively, from the December 2008 estimates. At a copper equivalent cutoff grade of 0.3% copper, the updated measured and indicated resources totaled 5.94 billion metric tons (Gt) grading 0.42% copper (0.78% copper equivalent) and containing 25 Mt of copper; the updated inferred mineral resource totaled 4.84 Gt grading 0.24% copper (0.53% copper equivalent) and containing 11.6 Mt of copper. An updated

preliminary assessment, released in February 2011, found that the Pebble prospect could support a 200,000 t/d of ore open pit mine for a minimum of 25 years with a potential to extend to 78 years or beyond, or alternatively, the potential for an underground block-cave mine processing 136,000 t/d for mining beyond the initial 25-year period. Using a 45-year base case, the study concluded that the Pebble project could produce 14 Mt of copper while mining only 32% of the total Pebble resource; produce, at prevailing metal prices, an annual internal pretax rate of return of 23.2% and a 3.2-year payback; require an initial capital investment of $4.67 billion, exclusive of costs associated with outsourced power and port and road development; and would take 4 years to construct (Northern Dynasty Minerals Ltd., 2010; 2011, p. 1–3).

PolyMet Mining Corp. (Vancouver) was proceeding with the permitting of the NorthMet copper-nickel-precious metals project (mine and processing plant) in northeastern Minnesota, a process that began in 2002. In June, PolyMet announced that the State and Federal Government agencies responsible for the EIS would be preparing a supplemental draft EIS. In early 2011, Polymet announced its intent to simplify the phase 2 metallurgical process by eliminating a second autoclave and SX-EW circuit, instead opting to sell copper concentrates along with nickel-cobalt and precious metal products, reducing its environmental impact and reducing capital costs, based on 2008 estimates, by $127 million (Polymet Mining Corp., 2010; 2011).

Redstone Resources Corp. (Lakewood, CO) continued predevelopment work at the past-producing Zonia Mine (Arizona). Redstone was proceeding with five development programs aimed at generating a final feasibility study. A preliminary economic analysis, released in April 2011 (an update of the previous study released in December 2009) reported measured and indicated in-pit resources for a theoretical 27,000 t/d open pit leach operation of 100 Mt of ore grading an average of 0.28% copper (Redstone Resources Corp., 2011, p. 9).

Rio Tinto plc (London, United Kingdom) was proceeding with the development of two underground mines. Preproduction work continued on the Resolution copper sulfide mine operated by Resolution Copper Mining, LLC (55% Rio Tinto and 45% BHP Billiton) located more than 2,100 meters below the surface and beneath BHP Billiton's shuttered Magma Mine in Arizona, with the goal of beginning production by 2020. Resolution was seeking a land exchange required to access about 3,100 hectares of federally controlled property. Legislation introduced during 2009 in both houses of the U.S. Congress to facilitate the exchange was pending at yearend 2010. Rio Tinto also planned to invest $469 million in the Kennecott Eagle nickel and copper mine in the Upper Peninsula of Michigan, with first production expected in 2013 and production capacity of 17,300 t/yr and 13,200 t/yr of nickel and copper in concentrate, respectively. In support of these mine developments, as well as the Oyu Tolgoi Mine in Mongolia, Rio Tinto announced an expansion of its "Mine of the Future" program with a $10 million investment to develop new equipment and systems for deep underground mines and to create the Rio Tinto Centre for Underground Mine Construction in Sudbury, Ontario, Canada. The underground mining center would become the Rio Tinto's fifth global long-term research center (Resolution Copper Mining, LLC, 2009, p. 6–7; Rio Tinto plc, 2010a, b).

## Consumption

Following an 18% decline in consumption in 2009 to the lowest level since the recession of 1975, U.S. reported consumption of refined copper increased by about 7% in 2010. Consumption by wire-rod producers, which accounted for 70% of reported consumption, increased by about 9%, and consumption by other consumers increased only nominally. Consumption by wire-rod producers was buoyed by a shift in wire-rod trade, the United States becoming a net exporter of 39,000 t of wire rod in 2010 from having had an essentially balanced net trade in 2009. According to data compiled by the American Bureau of Metal Statistics, Inc. (ABMS) (2011b), U.S. apparent consumption of wire rod in 2010 reversed a 4-year downward trend, increasing by about 6% from that in 2009.

According to ABMS, shipments of copper and copper alloy mill products by domestic producers rose by 13% in 2010 to 982,000 t, reversing a 5-year downward trend. From 2004 to 2010, however, apparent consumption (domestic shipments plus net imports), declined by 37%. In 2010, apparent consumption rose in all market segments, with the exception of copper tube (30% market share in 2010), where apparent consumption declined for the fifth consecutive year, decreasing by 4% in 2010, owing to the continued weak housing market and the continued substitution by plastic tube in residential markets. Apparent consumption of copper and copper alloy plate, sheet, and strip, with a combined 35% market share, rose by 22% in 2010; copper and copper alloy rod and bar, with a combined market share of 33%, rose by 27%; and copper alloy tube, with a market share of less than 2%, rose by 29% (American Bureau of Metal Statistics, Inc., 2011a).

According to preliminary data from the Copper Development Association Inc. (2011, p. 18–20), the total supply 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, rose by about 10% in 2010 from the revised shipments for 2009, reversing a 5-year downward trend. Wire-mill products accounted for about 53% of total shipments to the domestic market; brass mill products, 43%; and foundry and powder products, 4%. Shipments to the building construction sector, which remained the leading end-use market, were essentially unchanged and accounted for about 45% of shipments. Shipments to the electric and electronic products (23% market share), transportation equipment (13% market share), consumer and general products (12% market share), and industrial machinery and equipment (8% market share) sectors rose by 23%, 20%, 20%, and 7%, respectively.

## Prices and Stocks

Although copper prices on average trended upward throughout 2010, the COMEX spot price, which began the year at $3.33 per pound of copper and averaged $3.43 per pound for the full year, fluctuated significantly through several cycles. Prices during the first 6 months of 2010 reached lows of $2.85 per pound and $2.76 per pound on February 5 and June 6, respectively, and peak values of $3.48 per pound and $3.63 per pound on January 6 and April 15, respectively. Although still fluctuating, prices generally trended upward

during the last 6 months of the year; 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.

The price cycles in the first half of the year correlated with China's import levels. After high yearend imports in December 2009 of 244,000 t, China's copper purchases declined in January to 197,000 t before climbing to 337,000 t in April, approaching the record-high import level of 379,000 t set in June 2009, before retreating back to 212,000 t in June 2010. Global exchange inventories (COMEX, London Metal Exchange Ltd., and SHFE) trended upward during the first 4 months of the year from 687,000 t at yearend 2009 to 778,000 t at the end of April, countering some of the influence of Chinese buying and contributing to the price volatility. Exchange stocks fell from May through September to about 540,000 t, where they remained through November, rising slightly at yearend to 568,000 t. Lower stock levels, continued strong imports by China (1.58 Mt in the last 6 months of 2010 compared with 1.34 Mt in the first 6 months of the year), and investment interest helped to sustain the price rise during the last 6 months of 2010. Full-year 2010 Chinese imports totaled 2.92 Mt, down from the record-high 3.19 Mt in 2009.

According to ICSG data, global demand for refined copper in 2010 exceeded production by about 350,000 t, reversing a 2-year trend during which production exceeded demand by a combined 375,000 t and reported yearend global inventories of refined copper rose by about 400,000 t. Global commodity exchange and industry stocks totaled 1.19 Mt at yearend 2010 and, at the average annual monthly rate of consumption, represented about 3.2 weeks of global supply (International Copper Study Group, 2011a, p. 9).

Copper scrap prices generally followed the trend in refined copper prices. With higher refined 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 38.8 cents per pound for the year, above the average discount of 29.6 cents per pound in 2009, and ranged between 29.4 cents per pound in June and 65.9 cents per pound in December, when refined copper prices rose sharply. Higher refined copper prices and reduced export demand converged to raise the discount at yearend. Although following the same trend, the discount for No. 1 brass mill scrap remained much smaller, averaging 10.4 cents per pound for the year, and ranging between 6.6 cents per pound in May to 18.5 cents per pound in December.

### Foreign Trade

Net refined copper imports in 2010 declined for the fourth consecutive year, falling by about 10% to 527,000 t. In light of lower imports and increased domestic demand, domestic inventories of copper, which had risen by about 235,000 t in 2009, declined by about 50,000 t in 2010. Chile, Canada, and Peru were the leading sources of refined copper imports in 2010, accounting for 51%, 28%, and 16%, respectively, of refined imports. From 2007 through 2010, Chile was the leading source of unwrought copper products (42%), followed by Canada (33%), and Peru (13%). Refined copper accounted for 83% of unwrought copper imports during the same period. Exports of copper contained in concentrates declined for the second consecutive year to 137,000 t, down from 301,000 t in 2008 and 151,000 t in 2009, owing to reduced mine production from nonintegrated producers and increased smelter operating rates at integrated producers, and after maintenance shutdowns reduced smelter output in 2008.

According to the U.S. Census Bureau data compiled by the Copper and Brass Fabricators Council Inc. (2011, p. 1–9), in 2010, U.S. imports of copper and copper-alloy semifabricated products (excluding wire-rod mill products) were 226,000 t (an increase of 17% from those in 2009), exports were 104,000 t (an increase of 6%), and the resulting net imports rose by 28% to 122,000 t. Canada and Mexico collectively accounted for 64% of semifabricated copper exports and 24% of imports. China, which had been the leading source of imports with a 26% share in 2009, accounted for only 13% of imports in 2010. In anticipation of the ITA antidumping orders finalized in November, imports of copper tube from China and Mexico declined by 55% (23,000 t) and 34% (8,000 t), respectively, from those in 2009.

Exports of copper and copper alloy scrap rose by 23% to a record-high 1.03 Mt. China (including Hong Kong) was the destination for 79% of domestic scrap exports and, based on global import data (official country trade data compiled by the ICSG), was the recipient of 62% of reported global scrap trade of 7.2 Mt. Germany and Belgium, the leading secondary copper smelting countries in Europe, were significant recipients of U.S. scrap, combined accounting for 4% of U.S. scrap exports and 12% of global imports in 2010, up from 3% and 11%, respectively, in 2009 (International Copper Study Group, 2011a, p. 41–43).

### World Review

Following 2 years of limited growth, world production of refined copper rose by about 750,000 t (about 4%) led by an 11% increase in secondary refined production. Production of refined copper from primary materials rose by about 3%. After remaining stagnant for 2 years, world copper use, according to revised ICSG data, rose by about 7% to a record-high 19.4 Mt. Consequently, the ICSG global market balance indicated a production deficit of about 350,000 t, reversing a 2-year cumulative surplus of  350,000 t. Stocks held on the more visible commodity exchanges fell by about 120,000 t to 568,000 t, yet remained well above yearend 2008 stocks of 390,000 t. ICSG estimates of total reported inventories (exchanges, governments, and industry) fell by 160,000 t to 1.19 Mt. With the exception of exchange inventories, inventory levels in China were not reported and were discounted 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, 2011a, p. 9–20).

World mine production of copper rose nominally (75,000 t) in 2010 to 16.0 Mt. World copper mine production had remained relatively flat from 2005 to 2010, increasing by only about 7% during the period. This low level of growth took place despite an estimated 19% capacity growth from 2005 to 2010, according to data compiled by the ICSG. Consequently, based

on ICSG production and capacity data, capacity utilization at global copper mines trended consistently downward from 88.9% in 2005 to 80% in 2010. 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; 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 2010 (International Copper Study Group, 2011b, p. 13).

Global smelter capacity and production increased by about 150,000 t/yr, and 700,000 t, respectively, in 2010 while production of copper in concentrates remained relatively unchanged at 12.7 Mt. Some of the concentrate shortfall was met by a 300,000-t increase in copper recovered from scrap. Consequently, concentrate supplies continued to remain tight through most of 2010 (International Copper Study Group, 2011b, p. 14).

According to CRU International Ltd. (2010, p. 73–77; 2011, p. 69–75) consumption of copper in concentrates exceeded supply by about 180,000 t and fell far short of global demand as smelter capacity utilization fell to 69.5% from 72.2% in 2008. CRU estimated that the cumulative 4-year deficit was about 460,000 t of copper in concentrate. The combined spot treatment (smelting) and refining charge (TC/RC), which had fallen to about 3 cents per pound during the fourth quarter of 2009, remained low during the first half of 2010, reportedly falling into negative figures during the second quarter based on an extreme tightness in the concentrate market. Spot purchases by the dominant Chinese smelters (75% to 80% of the spot market according to CRU estimates) softened during the second half of 2010, however, and spot TC/RCs rose to about 20 cents per pound during the fourth quarter of the year. Spot TC/RCs have trended lower since 2005, when they averaged about 40 cents per pound of copper. Term contracts were much less volatile and averaged about 10 to 12 cents per pound during the year.

After stagnating in 2009, global consumption of refined copper rose by about 7% (1.3 Mt) to a record-high 19.4 Mt in 2010. While Asia, dominated by China, had been the only major copper consuming region to experience growth during the preceding 3 years, consumption in all major consuming regions increased during 2010. In Asia, demand increased by about 10%, despite only 4% growth in China. As noted, China's apparent consumption excludes estimates of unreported stock changes, which can distort year-on-year changes. It is likely that significant stocks accumulated during 2009 when apparent consumption in China increased by 37%, significantly exceeding the country's 4.4% growth in semifabricate production. Conversely, some accumulated stocks likely were released during 2010 when semifabricate production increased by about 15.5% and apparent consumption of refined copper by only 4%. China remained the leading consumer of refined copper, however, accounting for 38% of world demand in 2010. In Japan, the fourth ranked consumer of copper, consumption rose by 21% to 1.06 Mt, but remained below the 2008 prerecession level. In the European Union-15 countries, the second leading consuming region after Asia, consumption rose by 8.7%, yet also remained below the 2008 level. Consumption in the United States-dominated North American market, the third leading consuming region, rose by about 6% (International Copper Study Group, 2011a, p.10–23).

Relatively little global realignment of the copper industry took place during 2010, with the exception that Grupo México, S.A.B. de C.V. rose to be the sixth and tenth ranked copper mine and refinery producer, respectively, following Chapter 11 restructuring of Asarco and its return to Grupo México's control at yearend 2009. Corporación Nacional del Cobré de Chile (Codelco) retained its position as the leading global mine producer of copper. FCX, BHP Billiton, Xstrata plc (Zug, Switzerland) (exclusive of Glencore's approximate 30% share), and Rio Tinto retained their positions as the second through fifth leading producers, respectively. Combined, the top 5 copper-producing companies accounted for 37% of global mine production, and the top 10 producers accounted for 54%. Codelco retained its position as the leading producer of refined copper, followed by Arubis AG (Hamburg, Germany), FCX, Jiangxi Copper Corp. (Guixi City, Jiangxi Province, China), and Xstrata. The top 5 refiners accounted for 30% of global copper mine production, and the top 10 refiners accounted for 45% (CRU International Ltd., 2011, p. 254).

**Outlook**

Refined copper prices reached record-high average levels in 2011, with the COMEX price averaging $4.00 per pound of copper. Prices, which began 2011 above $4.00 per pound, rose to record-high spot prices in mid-February, with the COMEX price peaking at $4.62 per pound, and generally trending downward to an average of $3.39 per pound in December. High imports of refined copper by China in the fourth quarter of 2010 and the first 2 months of 2011 supported the price rise. Although trending downward throughout the rest of 2011, continued tight supplies, as indicated by combined exchange inventories which finished the year slightly below those at yearend 2009, helped to support relatively high prices. According to preliminary ICSG data, world apparent consumption of refined copper for the first 9 months of 2011 increased by only about 1% above that for the same period of 2010, with consumption in China, the United States, and the European Union remaining essentially unchanged from that in the same period of 2010. Despite an earthquake and tsunami in March, consumption in Japan was down by only about 4% for the same comparative periods. Russia, where reinstatement of an export tariff on refined copper encouraged the conversion of cathode to wire rod prior to export, was the only country to experience significant growth in demand. Despite increases in capacity, world mine production for the first 9 months of 2011 was essentially unchanged from that in the same period of 2010 primarily owing to worker strikes that disrupted production in Chile and Indonesia. World refined production in the first 9 months of 2011, however, rose by almost 3%, principally owing to an almost 300,000-t increase in secondary refined production (International Copper Study Group, 2011a, p. 9–16).

In the United States, mine production in 2011 was essentially unchanged from that in 2010 as restoration of production that was cutback at yearend 2008 was mostly offset by lower ore grades at

a major producer. Electrolytic refinery production declined owing to the 2010 closure of a refinery that treated imported anode and to lower domestic smelter output, the latter resulting in increased concentrate exports. U.S. copper mine production was expected to rise by more than 100,000 t in 2012, primarily owing to continued restoration of production. Domestic consumption of refined copper was nearly unchanged in 2011 despite economic improvement, in large part owing to a shift from being a net exporter to a net importer of wire rod. As a result of high prices and strong demand in China and Europe, exports of copper scrap from the United States rose by about 20% to a record-high 1.24 Mt.

### References Cited


American Bureau of Metal Statistics, Inc., 2011a, Copper and copper alloy mill products—December 2010: Chatham, NJ, American Bureau of Metal Statistics, Inc. Report 3, June 27, 11 p.

American Bureau of Metal Statistics, Inc., 2011b, US copper wirerod market—December 2010: Chatham, NJ, American Bureau of Metal Statistics, Inc. Report 4, March 9, 6 p.

Augusta Resource Corp., 2010a, Augusta announces minority JV with Korean consortium: Vancouver, British Columbia, Canada, Augusta Resource Corp. press release, September 16, 1 p.

Augusta Resource Corp., 2010b, Augusta provides Rosemont copper permit update: Vancouver, British Columbia, Canada, Augusta Resource Corp. press release, November 16, 1 p.

Augusta Resource Corp., 2011, U.S. Forest Service announces schedule for Rosemont record of decision: Vancouver, British Columbia, Canada, Augusta Resource Corp. press release, April 14, 1 p.

BHP Billiton, 2011, BHP Billiton production report for the half year ended 31 December 2010: London, United Kingdom, BHP Billiton, 8 p.

Copper and Brass Fabricators Council Inc., 2011, Copper and brass products import/export report—December 2009: Washington, DC, Copper and Brass Fabricators Council Inc., January, 237 p.

Copper Development Association Inc., 2011, Annual data 2009—Copper supply and consumption: New York, NY, Copper Development Association Inc., 21 p.

CRU International Ltd., 2010, Copper quarterly industry and market outlook—October 2010: London, United Kingdom, CRU International Ltd., 270 p.

CRU International Ltd., 2011, Copper quarterly industry and market outlook—July 2011: London, United Kingdom, CRU International Ltd., 262 p.

Curis Resources Ltd., 2010, Curis receives a strong preliminary economic assessment of its 3 billion pound Florence in-situ copper recovery project: Vancouver, British Columbia, Canada, Curis Resources Ltd. news release, October 12, 1 p.

Formation Metals Inc., 2010, Formation Metals concludes Stage I construction on Idaho cobalt project: Vancouver, British Columbia, Canada, Formation Metals Inc. press release, April 30, 1 p.

Formation Metals Inc., 2011, Formation Metals cobalt mine commencement of construction targeted for Q2: Vancouver, British Columbia, Canada, Formation Metals Inc. press release, April 6, 1 p.

Freeport-McMoRan Copper & Gold Inc., 2010, FCX reports first-quarter 2010 results: Phoenix, AZ, Freeport-McMoRan Copper & Gold Inc. news release, April 21, 37 p.

Freeport-McMoRan Copper & Gold Inc., 2011a, Form 10–K—2010: U.S. Securities and Exchange Commission, 191 p.

Freeport-McMoRan Copper & Gold Inc., 2011b, FCX reports fourth-quarter and yearend December 31, 2010 results: Phoenix, AZ, Freeport-McMoRan Copper & Gold Inc. news release, January 20, 41 p.

Grupo México, S.A.B. de C.V., 2011, Annual report—2010: Mexico City, Mexico, Grupo México, S.A.B. de C.V., 136 p.

International Copper Study Group, 2011a, Copper bulletin: Lisbon, Portugal, International Copper Study Group, v. 18, no. 12, December, 54 p.

International Copper Study Group, 2011b, Directory of copper mines and plants 2009 to 2014—March: Lisbon, Portugal, International Copper Study Group, 118 p.

Lisbon Valley Mining Co. LLC, 2010, Lisbon Valley Mining Company, our history: Moab, UT, Lisbon Valley Mining Co. LLC. (Accessed April 2, 2011, at http://lisbonmine.net/history.html.)

Mercator Minerals Ltd., 2011, Annual information form for the financial year ended December 31, 2010: Kingman, AZ, Mercator Minerals Ltd., March 31, 77 p. (Accessed September 10, 2011, at http://www.mercatorminerals.com/i/pdf/filings/AIF_2010.pdf.)

Mines Management, Inc., 2011, Mines Management Inc. 2010 annual report: Spokane, WA, Mines Management, Inc., 10 p.

Nord Resources Corp., 2011, Nord Resources reports 2010 year-end results: Dragoon, AZ, Nord Resources Corp. press release, April 1, 10 p.

Northern Dynasty Minerals Ltd., 2010, Updated mineral resource estimate confirms the Pebble project as North America's most important new copper-gold-molybdenum development opportunity: Vancouver, British Columbia, Canada, Northern Dynasty Minerals Ltd. news release, February 1, 3 p.

Northern Dynasty Minerals Ltd., 2011, Northern Dynasty receives positive preliminary assessment technical report for globally significant Pebble copper-gold-molybdenum project in Southwest Alaska: Vancouver, British Columbia, Canada, Northern Dynasty Minerals Ltd. news release, February 23, 17 p.

Polymet Mining Corp., 2010, PolyMet EIS—Path forward to completion announced: Vancouver, British Columbia, Canada, Polymet Mining Corp. news release, June 25, 2 p.

Polymet Mining Corp., 2011, PolyMet simplifies metallurgical process at NorthMet Project: Vancouver, British Columbia, Canada, Polymet Mining Corp. news release, February 2, 1 p.

Quadra FNX Mining Ltd., 2011a, Annual report 2010: Vancouver, British Columbia, Canada, Quadra FNX Mining Ltd., 43 p.

Quadra FNX Mining Ltd., 2011b, Quadra FNX announces fourth quarter and 2010 results and provides guidance for 2011: Vancouver, British Columbia, Quadra FNX Mining Ltd. news release, January 24, 5 p.

Redstone Resources Corp., 2011, Zonia copper project preliminary assessment update NI 43–10–1 technical report: Lakewood, CO, Redstone Resources Corp., April 29, 192 p. (Accessed November 2, 2011, at http://zoniamine.com/Redstone_Zonia_04_29_11 Final signed.pdf.)

Resolution Copper Mining, LLC, 2009, 2009 five-year community relations plan: Superior, AZ, Resolution Copper Mining, LLC, December 15, 22 p. (Accessed September 3, 2010, at http://www.resolutioncopper.com/res/whoweare/2.html.)

Rio Tinto plc, 2010a, Rio Tinto announces new global centre for underground mine construction in Canada: London, United Kingdom, Rio Tinto plc press release, November 26, 1 p.

Rio Tinto plc, 2010b, Rio Tinto to invest US$469 million in development of Kennecott Eagle nickel and copper mine: London, United Kingdom, Rio Tinto plc press release, June 15, 1 p.

Rio Tinto plc, 2011, Fourth quarter 2010 operations review: London, United Kingdom, Rio Tinto plc press release, January 18, 26 p.

U.S. Department of Commerce, 2010a, North American Free Trade Agreement, article 1904 NAFTA panel reviews; request for panel review: Federal Register, v. 75, no. 250, December 30, p. 82375–82376.

U.S. Department of Commerce, 2010b, 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.


## 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 20041–395.

### 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.

Copper. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.

TABLE 1

SALIENT COPPER STATISTICS[1]

(Metric tons, unless otherwise specified)

| | | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| United States: | | | | | | |
| Mine production: | | | | | | |
| Ore concentrated | thousand metric tons | 163,000 | 138,000 | 156,000 | 149,000 | 152,000 |
| Average yield of concentrated ore | percent | 0.40 | 0.46 | 0.50 | 0.46 | 0.43 |
| Recoverable copper: | | | | | | |
| Arizona | | 712,000 | 731,000 | 836,000 | 711,000 | 703,000 |
| New Mexico | | 113,000 | 108,000 | 104,000 | 56,500 | 52,700 |
| Other States | | 372,000 | 329,000 | 368,000 | 414,000 | 353,000 |
| Total | | 1,200,000 | 1,170,000 | 1,310,000 | 1,180,000 | 1,110,000 |
| Total value | millions | $8,310 | $8,450 | $9,200 | $6,290 | $8,520 |
| Smelter production: | | | | | | |
| Primary and secondary | | 501,000 | 617,000 | 574,000 | 597,000 | 601,000 |
| Byproduct sulfuric acid, sulfur content | thousand metric tons | 576 | 720 | 655 | 671 | 682 e |
| Refinery production: | | | | | | |
| Primary materials: | | | | | | |
| Electrolytic from domestic ores | | 531,000 | 702,000 | 603,000 | 588,000 | 606,000 |
| Electrolytic from foreign materials | | 144,000 | 62,100 | 109,000 | 48,300 | 21,000 |
| Electrowon | | 530,000 | 504,000 | 507,000 | 476,000 | 430,000 |
| Total | | 1,210,000 | 1,270,000 | 1,220,000 | 1,110,000 | 1,060,000 |
| Secondary materials (scrap), electrolytic and fire refined | | 44,800 | 46,000 | 53,800 | 46,400 | 37,700 |
| Grand total | | 1,250,000 | 1,310,000 | 1,270,000 | 1,160,000 | 1,090,000 |
| Secondary copper produced: | | | | | | |
| Recovered from new scrap | | 819,000 | 767,000 | 697,000 | 639,000 r | 641,000 |
| Recovered from old scrap | | 151,000 | 158,000 | 156,000 | 138,000 r | 131,000 |
| Total | | 969,000 | 925,000 | 852,000 | 777,000 r | 772,000 |
| Copper sulfate production | | 19,500 | 22,600 | 22,000 | 22,400 | 23,400 |
| Exports, refined | | 106,000 | 51,100 | 36,500 | 80,800 | 78,300 |
| Imports, refined | | 1,070,000 | 829,000 | 724,000 | 664,000 | 605,000 |
| Stocks, December 31: | | | | | | |
| Blister and in-process material | | 18,800 | 26,300 | 24,100 | 15,500 | 21,100 |
| Refined copper: | | | | | | |
| Refineries | | 28,100 | 21,800 | 18,300 | 23,700 | 10,300 |
| Wire-rod mills | | 21,500 | 20,600 | 31,700 | 25,300 | 19,700 |
| Brass mills | | 34,500 | 10,400 | 8,340 | 7,610 | 6,400 |
| Other industry | | 3,280 | 3,220 | 3,230 | 4,290 | 4,380 |
| COMEX | | 30,900 | 13,500 | 31,300 | 90,000 | 58,600 |
| London Metal Exchange (LME), U.S. warehouses | | 75,600 | 60,600 | 106,000 | 283,000 | 284,000 |
| Total | | 194,000 | 130,000 | 199,000 | 434,000 | 384,000 |
| Consumption: | | | | | | |
| Refined copper, reported | | 2,110,000 | 2,140,000 | 2,020,000 | 1,650,000 | 1,760,000 |
| Apparent consumption, primary refined and old scrap[2] | | 2,200,000 | 2,270,000 | 1,990,000 | 1,580,000 | 1,740,000 |
| Price: | | | | | | |
| Producer, weighted average | cents per pound | 314.75 | 328.00 | 319.16 | 241.24 | 348.34 |
| COMEX, first position | do. | 308.94 | 322.17 | 313.35 | 235.42 | 342.51 |
| LME, Grade A cash | do. | 304.85 | 322.83 | 315.47 | 233.56 | 341.74 |
| World, production: | | | | | | |
| Mine | thousand metric tons | 15,100 | 15,500 | 15,600 r | 15,900 | 16,000 |
| Smelter | do. | 14,100 | 14,300 | 14,700 | 14,900 r | 15,600 |
| Refinery | do. | 17,300 | 17,900 | 18,300 | 18,400 | 19,100 |

See footnotes at end of table.

TABLE 1—Continued
SALIENT COPPER STATISTICS[1]

[e]Estimated. [r]Revised. do. Ditto.

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

[2]In 2006, 2007, 2008, 2009, and 2010, apparent consumption is calculated using general imports of 1,080,000 metric tons (t), 832,000 t, 721,000 t, 645,000 t, and 583,000 t, respectively.

TABLE 2
LEADING COPPER-PRODUCING MINES IN THE UNITED STATES IN 2010, IN ORDER OF OUTPUT[1]

| Rank | Mine | County and State | Operator | Source of copper | Capacity (thousand metric tons) |
|---|---|---|---|---|---|
| 1 | Bingham Canyon | Salt Lake, UT | Kennecott Utah Copper Corp.[2] | Copper-molybdenum ore, concentrated and leached | 300 |
| 2 | Morenci | Greenlee, AZ | Freeport-McMoRan Copper & Gold Inc. | do. | 400 |
| 3 | Ray | Pinal, AZ | ASARCO LLC | Copper ore, concentrated and leached | 140 |
| 4 | Bagdad | Yavapai, AZ | Freeport-McMoRan Copper & Gold Inc. | Copper-molybdenum ore, concentrated and leached | 110 |
| 5 | Mission Complex | Pima, AZ | ASARCO LLC | Copper-molybdenum ore, concentrated | 80 |
| 6 | Sierrita | do. | Freeport-McMoRan Copper & Gold Inc. | Copper-molybdenum ore, concentrated and leached | 80 |
| 7 | Safford | Graham, AZ | do. | Copper ore, leached | 110 |
| 8 | Robinson | White Pine, NV | Quadra 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 | Silver Bell | Pima, AZ | ASARCO LLC | Copper ore, leached | 22 |
| 12 | Chino | Grant, NM | Freeport-McMoRan Copper & Gold Inc. | Copper-molybdenum ore, leached | 135 |
| 13 | Mineral Park | Mohave, AZ | Mercator Minerals Ltd. | Copper-molybdenum ore, concentrated and leached | 17 |
| 14 | Carlota | Gila, AZ | Quadra Mining Ltd. | Copper ore, leached | 15 |
| 15 | Phoenix | Lander, NV | Newmont Mining Corp. | Gold-copper ore, concentrated | 15 |
| 16 | Miami | Gila, AZ | Freeport-McMoRan Copper & Gold Inc. | Copper ore, leached | 50 |
| 17 | Lisbon Valley | San Juan, UT | Lisbon Valley Mining Co. LLC | do. | 7 |
| 18 | Johnson Complex | Cochise, AZ | Nord Resources Corp. | do. | 5 |

do. Ditto.

[1]The mines on this list accounted for more than 99% of U.S. mine production in 2010.

[2]Wholly owned subsidiary of Rio Tinto plc.

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)

| | 2009 | | 2010 | |
|---|---|---|---|---|
| Source and treatment process | Gross weight | Recoverable copper | Gross weight | Recoverable copper |
| Mined copper ore: | | | | |
| Concentrated | 149,000,000 | 683,000 | 152,000,000 | 659,000 |
| Leached | NA | 476,000 | NA | 430,000 |
| Total | NA | 1,160,000 | NA | 1,090,000 |
| Copper precipitates shipped, leached from tailings, dumps, and in-place material | NA | W | NA | W |
| Other copper-bearing ores[2] | 4,480,000 | 21,900 | 4,780,000 | 19,700 |
| Grand total | XX | 1,180,000 | XX | 1,110,000 |

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

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

[2]Includes gold ore, lead ore, silver ore, and zinc 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 |
|---|---|---|---|---|---|
| 2009: | | | | | |
| Copper scrap | 685,000 [r, 2] | W | 67,100 [r] | 159,000 | 911,000 [r] |
| Refined copper[3] | 454,000 | 1,140,000 | 49,500 | 4,510 | 1,650,000 |
| Hardeners and master alloys | 9,990 | -- | 3,090 | -- | 13,100 |
| Brass ingots | -- | -- | 55,400 [r] | -- | 55,400 [r] |
| Slab zinc | 44,800 | -- | (4) | (4) | 107,000 |
| 2010: | | | | | |
| Copper scrap | 694,000 [2] | W | 66,100 | 150,000 | 911,000 |
| Refined copper[3] | 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 |

[r]Revised. 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]Includes item indicated by symbol W.

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

[4]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 |
|---|---|---|---|---|---|
| 2009: | | | | | |
| Wire-rod mills | 1,140,000 | -- | -- | 4,620 | 1,140,000 |
| Brass mills | 313,000 | 24,200 | 43,600 | 72,800 | 454,000 |
| Chemical plants | -- | -- | -- | 367 | 367 |
| Ingot makers | W | W | W | 4,510 [2] | 4,510 |
| Foundries | 3,450 | 3,240 | -- | 12,400 | 19,100 |
| Miscellaneous[3] | W | W | W | 30,100 [2] | 30,100 |
| Total | 1,450,000 | 27,400 | 43,600 | 125,000 | 1,650,000 |
| 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 [2] | 4,510 |
| Foundries | 3,470 | 3,150 | -- | 11,500 | 18,200 |
| Miscellaneous[3] | W | W | W | 34,600 [2] | 34,600 |
| Total | 1,570,000 | 22,500 | 44,100 | 127,000 | 1,760,000 |

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]Includes items indicated by symbol W.

[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)

| | 2009 | 2010 |
|---|---|---|
| Kind of scrap: | | |
| New scrap: | | |
| Copper-base | 608,000 | 611,000 |
| Aluminum-base | 30,400 r | 30,300 |
| Nickel-base | 18 | 18 |
| Total | 639,000 r | 641,000 |
| Old scrap: | | |
| Copper-base | 120,000 | 109,000 |
| Aluminum-base | 17,800 r | 21,800 |
| Nickel-base | 267 | 266 |
| Zinc-base | 9 | 9 |
| Total | 138,000 r | 131,000 |
| Grand total | 777,000 r | 772,000 |
| Form of recovery: | | |
| As unalloyed copper | 47,100 | 39,000 |
| In brass and bronze | 676,000 r | 676,000 |
| In alloy iron and steel | 673 | 731 |
| In aluminum alloys | 48,200 r | 51,900 |
| In other alloys | 8 | 9 |
| In chemical compounds | 5,030 | 5,030 |
| Total | 777,000 r | 772,000 |

rRevised.

[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)

| | From new scrap | | From old scrap | | Total | |
|---|---|---|---|---|---|---|
| Type of operation | 2009 | 2010 | 2009 | 2010 | 2009 | 2010 |
| Ingot makers | 11,500 | 11,700 | 62,400 | 59,800 | 73,900 | 71,500 |
| Refineries[2] | 20,800 | 19,100 | 25,600 | 18,600 | 46,400 | 37,700 |
| Brass and wire-rod mills | 545,000 | 548,000 | 16,500 | 17,200 | 561,000 | 565,000 |
| Foundries and manufacturers | 26,100 r | 27,700 | 15,300 r | 13,300 | 41,400 r | 40,900 |
| Chemical plants | 5,030 | 5,030 | -- | -- | 5,030 | 5,030 |
| Total | 608,000 | 611,000 | 120,000 | 109,000 | 728,000 | 720,000 |

rRevised. -- Zero.

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

[2]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[1]

(Metric tons)

| Item produced from scrap | 2009 | 2010 |
|---|---|---|
| Unalloyed copper products: | | |
| Refined copper | 46,400 | 37,700 |
| Copper powder | 587 | 1,230 |
| Copper castings | 82 | 82 |
| Total | 47,100 | 39,000 |
| Alloyed copper products: | | |
| Brass and bronze ingots: | | |
| Tin bronzes | 6,890 | 7,870 |
| Leaded red brass and semired brass | 52,400 | 46,100 |
| High leaded tin bronze | 7,330 | 8,450 |
| Yellow brass | 4,870 | 5,060 |
| Manganese bronze | 7,260 | 7,390 |
| Aluminum bronze | 5,860 | 5,920 |
| Nickel silver | 1,060 | 1,040 |
| Silicon bronze and brass | 4,710 | 4,620 |
| Copper-base hardeners and master alloys | 7,670 | 7,670 |
| Miscellaneous | 6,090 | 7,720 |
| Total | 104,000 | 102,000 |
| Brass mill and wire-rod mill products | 678,000 | 689,000 |
| Brass and bronze castings | 38,800 r | 35,800 |
| Copper in chemical products | 5,030 | 5,030 |
| Grand total | 873,000 | 871,000 |

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] | | | | | | | |
| 2009 | 86,700 r | 3,240 r | 4,910 r | 9,130 r | 116 | 11 | 104,000 |
| 2010 | 84,300 | 3,600 | 5,070 | 8,730 | 113 | 13 | 102,000 |
| Secondary metal content of brass mill products: | | | | | | | |
| 2009 | 565,000 | 1,180 | 2,270 | 109,000 | 860 | 16 | 678,000 |
| 2010 | 570,000 | 1,400 | 2,020 | 115,000 | 1,060 | 16 | 689,000 |
| Secondary metal content of brass and bronze castings: | | | | | | | |
| 2009 | 35,200 r | 1,170 | 578 r | 1,640 r | 203 r | 97 | 38,800 r |
| 2010 | 32,400 | 1,100 | 574 | 1,460 | 130 | 101 | 35,800 |

rRevised.

[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 in 2009 and 2010.

TABLE 10

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

(Metric tons, gross weight)

| Scrap type and processor | 2009 | | 2010 | |
|---|---|---|---|---|
| | Consumption | Stocks | Consumption | Stocks |
| Unalloyed scrap: | | | | |
| No.1 wire and heavy: | | | | |
| Smelters, refiners, and ingot makers | 45,000 | 968 | 17,300 | 849 |
| Brass and wire-rod mills | 332,000 | (2) | 319,000 | (2) |
| Foundries and miscellaneous manufacturers | 16,800 | (2) | 18,800 | (2) |
| No. 2 mixed heavy and light: | | | | |
| Smelters, refiners, and ingot makers | 40,600 | 2,240 | 59,700 | 2,500 |
| Brass and wire-rod mills | 8,590 | (2) | 10,200 | (2) |
| Foundries and miscellaneous manufacturers | 6,450 | (2) | 7,260 | (2) |
| Total unalloyed scrap: | | | | |
| Smelters, refiners, and ingot makers | 85,600 | 3,210 | 76,900 | 3,350 |
| Brass and wire-rod mills | 341,000 | 369 r | 330,000 | 686 |
| Foundries and miscellaneous manufacturers | 23,300 | 1,670 | 26,000 | 1,920 |
| Alloyed scrap: | | | | |
| Red brass:[3] | | | | |
| Smelters, refiners, and ingot makers | 20,600 | 1,550 | 22,500 | 1,560 |
| Brass mills | 9,230 | (2) | 11,100 | (2) |
| Foundries and miscellaneous manufacturers | 5,950 | (2) | 2,790 | (2) |
| Leaded yellow brass: | | | | |
| Smelters, refiners, and ingot makers | 9,970 | 640 | 9,930 | 820 |
| Brass mills | 116,000 | (2) | 103,000 | (2) |
| Foundries and miscellaneous manufacturers | 1,000 | (2) | 971 | (2) |
| Yellow and low brass, all plants | 127,000 | 577 r | 146,000 | 491 |
| Cartridge cases and brass, all plants | 87,800 | (2) | 98,200 | (2) |
| Auto radiators: | | | | |
| Smelters, refiners, and ingot makers | 20,200 | 774 | 18,100 | 862 |
| Foundries and miscellaneous manufacturers | 1,900 | (2) | 1,900 | (2) |
| Bronzes: | | | | |
| Smelters, refiners, and ingot makers | 10,800 | 612 | 11,900 | 874 |
| Brass mills and miscellaneous manufacturers | 15,800 | (2) | 16,300 | (2) |
| Nickel-copper alloys, all plants | 9,060 r | 178 r | 9,730 | 152 |
| Low grade and residues; smelters, refiners, miscellaneous manufacturers | 23,300 | 605 r | 23,000 | 468 |
| Other alloy scrap:[4] | | | | |
| Smelters, refiners, and ingot makers | 1,110 | 191 | 1,290 | 412 |
| Brass mills and miscellaneous manufacturers | 5,270 | (2) | 5,340 | (2) |
| Total alloyed scrap: | | | | |
| Smelters, refiners, and ingot makers | 73,700 | 5,010 | 73,700 | 5,510 |
| Brass mills | 347,000 | 545 r | 368,000 | 547 |
| Foundries and miscellaneous manufacturers | 43,800 r | 2,330 r | 40,100 | 2,020 |
| Total scrap: | | | | |
| Smelters, refiners, and ingot makers | 159,000 | 8,220 | 151,000 | 8,860 |
| Brass and wire-rod mills | 688,000 | 914 r | 698,000 | 1,230 |
| Foundries and miscellaneous manufacturers | 67,100 r | 4,000 r | 66,100 | 3,930 |

See footnotes at end of table.

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

[r]Revised.
[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," "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 | From new scrap | | From old scrap | | Total | |
|---|---|---|---|---|---|---|
| | 2009 | 2010 | 2009 | 2010 | 2009 | 2010 |
| Ingot makers | 34,000 [r] | 34,500 | 78,100 [r] | 77,200 | 112,000 | 112,000 |
| Smelters and refineries | 24,300 | 20,100 | 22,900 | 18,800 | 47,200 | 38,900 |
| Brass and wire-rod mills | 671,000 | 681,000 | 16,900 | 17,500 | 688,000 | 698,000 |
| Foundries and miscellaneous manufacturers | 50,700 [r] | 48,200 | 16,400 [r] | 17,900 | 67,100 [r] | 66,100 |
| Total | 780,000 [r] | 783,000 | 134,000 [r] | 131,000 | 915,000 [r] | 915,000 |

[r]Revised.
[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 | 2009 | 2010 |
|---|---|---|
| Tin bronzes | 8,340 | 9,160 |
| Leaded red brass and semired brass | 33,700 | 36,700 |
| Yellow, leaded, low brass[2] | 6,080 | 7,250 |
| Manganese bronze | 2,240 | 2,420 |
| Nickel silver[3] | 620 | 483 |
| Aluminum bronze | 3,020 | 3,440 |
| Hardeners and master alloys[4] | 3,090 | 4,370 |
| Lead free alloys[5] | 1,420 | 2,170 |
| Total brass ingot | 58,500 | 66,000 |
| Refined copper | 49,500 | 53,100 |
| Copper scrap | 67,100 [r] | 66,100 |

[r]Revised.
[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 |
| 2009 | 226.83 | 205.85 | 159.16 | 112.93 |
| 2010 | 325.19 | 297.67 | 252.40 | 164.12 |

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) |
| 2009 | 151,000 | $743,000 | 40,900 | $63,800 | 26,000 | $98,600 | 80,800 | $375,000 | 245,000 | $856,000 | 543,000 | $2,140,000 |
| 2010: | | | | | | | | | | | | |
| Belgium | 70 | 458 | 844 | 2,700 | 102 | 433 | 303 | 503 | 11,000 | 52,600 | 12,300 | 56,700 |
| Canada | 12,800 | 91,000 | 41,400 | 88,000 | 6,010 | 22,600 | 8,030 | 49,000 | 15,500 | 109,000 | 83,800 | 360,000 |
| China | 82,300 | 566,000 | 455 | 2,630 | 294 | 2,380 | 34,300 | 223,000 | 247,000 | 1,060,000 | 365,000 | 1,860,000 |
| Germany | 18 | 104 | 846 | 1,250 | 2,160 | 9,350 | 30 | 152 | 4,190 | 25,500 | 7,240 | 36,400 |
| Hong Kong | -- | -- | -- | -- | 1,740 | 13,500 | 4,690 | 34,800 | 10,300 | 53,500 | 16,700 | 102,000 |
| India | -- | -- | -- | -- | 458 | 3,470 | 66 | 295 | 965 | 5,960 | 1,490 | 9,720 |
| Japan | 9,610 | 66,300 | 100 | 395 | 1,920 | 17,400 | 39 | 69 | 7,180 | 48,600 | 18,800 | 133,000 |
| Korea, Republic of | 3,100 | 23,600 | -- | -- | 659 | 5,360 | 113 | 193 | 13,300 | 88,200 | 17,200 | 117,000 |
| Mexico | 24,700 | 140,000 | -- | -- | 670 | 4,020 | 16,100 | 119,000 | 4,090 | 25,400 | 45,500 | 289,000 |
| Taiwan | 1 | 5 | -- | -- | 454 | 3,450 | 800 | 5,390 | 2,940 | 17,000 | 4,200 | 25,800 |
| Other | 3,960 | 27,900 | 286 | 432 | 2,400 | 17,500 | 13,800 | 82,900 | 16,700 | 101,000 | 37,200 | 230,000 |
| Total | 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 |

-- 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]

| | Pipes and tubing | | Plates, sheets, foil, bars | | Bare wire, including wire rod[2] | | Wire and cable, stranded | | Copper sulfate | |
|---|---|---|---|---|---|---|---|---|---|---|
| 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) |
| 2009 | 21,200 | $164,000 | 20,700 | $138,000 | 126,000 | $668,000 | 20,400 | $163,000 | 5,880 | $9,700 |
| 2010: | | | | | | | | | | |
| Australia | 20 | 176 | 28 | 251 | 390 | 3,080 | 73 | 585 | 14 | 27 |
| Brazil | 39 | 347 | 91 | 806 | 3 | 58 | 15 | 3,170 | -- | -- |
| Canada | 7,790 | 70,000 | 7,160 | 65,000 | 37,400 | 275,000 | 8,930 | 78,500 | 2,120 | 4,910 |
| China | 139 | 1,820 | 2,690 | 19,400 | 4,250 | 28,800 | 1,500 | 17,200 | 1,180 | 2,090 |
| Denmark | 1 | 15 | 1 | 18 | 1 | 13 | 4 | 233 | -- | -- |
| France | 2 | 27 | 32 | 723 | 20 | 393 | 36 | 1,110 | -- | -- |
| Germany | 3 | 72 | 194 | 3,250 | 241 | 6,000 | 100 | 2,830 | 478 | 896 |
| Hong Kong | 6 | 72 | 249 | 2,720 | 229 | 779 | 129 | 5,110 | -- | -- |
| Italy | 28 | 249 | 21 | 550 | 28 | 406 | 16 | 405 | -- | -- |
| Japan | 2 | 36 | 224 | 3,700 | 15 | 363 | 256 | 4,520 | 88 | 121 |
| Korea, Republic of | 59 | 1,020 | 363 | 3,370 | 386 | 3,360 | 129 | 5,910 | 92 | 83 |
| Malaysia | 5 | 35 | 665 | 5,380 | 117 | 3,810 | 16 | 382 | 124 | 162 |
| Mexico | 7,510 | 67,600 | 9,770 | 82,700 | 118,000 | 756,000 | 11,000 | 93,500 | 143 | 201 |
| Netherlands | 82 | 718 | 78 | 1,680 | 31 | 634 | 18 | 540 | 333 | 634 |
| Saudi Arabia | 665 | 5,510 | 13 | 130 | 11 | 82 | 242 | 2,480 | 42 | 33 |
| Singapore | 56 | 1,160 | 165 | 1,860 | 24 | 277 | 82 | 1,910 | 21 | 20 |
| Sweden | (3) | 4 | (3) | 20 | 34 | 922 | 1 | 77 | -- | -- |
| Taiwan | 11 | 167 | 1,580 | 10,600 | 114 | 750 | 31 | 995 | 1,010 | 1,380 |
| Thailand | 31 | 428 | 55 | 754 | 18 | 294 | 16 | 558 | -- | -- |
| United Kingdom | 172 | 1,660 | 30 | 900 | 106 | 1,270 | 92 | 1,320 | 16 | 26 |
| Other | 850 | 7,930 | 660 | 7,370 | 1,590 | 19,900 | 2,690 | 35,000 | 2,300 | 3,510 |
| Total | 17,500 | 159,000 | 24,100 | 211,000 | 163,000 | 1,100,000 | 25,400 | 256,000 | 7,970 | 14,100 |

-- 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 2009 were 113,000 metric tons (t) valued at $572 million, and in 2010, wire rod exports were 144,000 t valued at $940 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) |
| 2009 | 137 | $271 | 759 | $2,260 | 68,400 | $389,000 | 664,000 | $3,120,000 | 16,300 | $52,000 | 749,000 | $3,570,000 |
| 2010: | | | | | | | | | | | | |
| Brazil | -- | -- | -- | -- | -- | -- | 1,980 | 14,100 | -- | -- | 1,980 | 14,100 |
| Canada | 1,270 | 1,960 | 310 | 1,110 | 21,700 | 157,000 | 168,000 | 1,230,000 | 9,010 | 53,500 | 200,000 | 1,450,000 |
| Chile | -- | -- | -- | -- | -- | -- | 308,000 | 2,290,000 | -- | -- | 308,000 | 2,290,000 |
| Costa Rica | -- | -- | -- | -- | -- | -- | -- | -- | 867 | 3,520 | 867 | 3,520 |
| Dominican Republic | -- | -- | -- | -- | -- | -- | -- | -- | 628 | 1,180 | 628 | 1,180 |
| Finland | -- | -- | -- | -- | 348 | 2,470 | 1 | 11 | -- | -- | 348 | 2,480 |
| Germany | -- | -- | -- | -- | (3) | 4 | 3,180 | 24,100 | 28 | 64 | 3,210 | 24,200 |
| Japan | -- | -- | 3 | 15 | 15 | 1,400 | 4,990 | 43,100 | 14 | 53 | 5,030 | 44,600 |
| Mexico | 17 | 13 | -- | -- | 3,990 | 38,700 | 19,200 | 149,000 | 5,850 | 18,100 | 29,000 | 206,000 |
| Peru | -- | -- | -- | -- | -- | -- | 97,100 | 706,000 | -- | -- | 97,100 | 706,000 |
| Other | 110 | 264 | 527 | 1,930 | 163 | 1,590 | 2,400 | 16,400 | 4,990 | 13,900 | 8,190 | 34,100 |
| Total | 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 |

-- 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]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 17

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

| | Pipes and tubing | | Plates, sheets, foil, bars | | Bare wire, including wire rod[2] | | Wire and cable, stranded | | Copper sulfate | |
|---|---|---|---|---|---|---|---|---|---|---|
| Country | 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) |
| 2009 | 1,670 | $12,700 | 42,500 | $290,000 | 120,000 | $594,000 | 10,900 | $69,600 | 49,300 | $88,200 |
| 2010: | | | | | | | | | | |
| Brazil | -- | -- | 1,240 | 10,500 | 8 | 88 | (4) | 4 | -- | -- |
| Canada | 13 | 117 | 2,150 | 18,300 | 99,800 | 749,000 | 539 | 4,520 | 4,540 | 9,290 |
| Chile | 65 | 504 | 4,630 | 35,400 | 35 | 205 | -- | -- | 3,050 | 6,430 |
| China | 30 | 181 | 2,300 | 18,900 | 304 | 3,210 | 317 | 2,130 | 4,720 | 6,890 |
| Finland | 245 | 3,300 | 4,380 | 41,400 | 609 | 6,020 | -- | -- | 3 | 25 |
| France | 5 | 211 | 1,600 | 13,400 | 90 | 5,750 | 39 | 821 | -- | -- |
| Germany | 260 | 3,000 | 21,600 | 200,000 | 1,010 | 11,100 | 111 | 2,240 | 130 | 186 |
| Israel | -- | -- | 3 | 23 | 326 | 3,520 | (4) | 5 | -- | -- |
| Italy | 14 | 210 | 740 | 6,070 | 1 | 103 | 7 | 110 | 1 | 7 |
| Japan | 16 | 257 | 1,050 | 15,600 | 225 | 5,000 | 2 | 34 | 27 | 485 |
| Korea, Republic of | (4) | 18 | 892 | 9,250 | 244 | 1,680 | 548 | 3,060 | 32 | 246 |
| Luxembourg | -- | -- | 1,250 | 16,400 | -- | -- | -- | -- | -- | -- |
| Mexico | 3,440 | 26,800 | 3,430 | 28,800 | 8,680 | 63,700 | 173 | 2,110 | 30,400 | 71,900 |
| Peru | -- | -- | 5,170 | 42,700 | 1,120 | 8,820 | -- | -- | 873 | 1,940 |
| Russia | -- | -- | -- | -- | 1 | 5 | -- | -- | 985 | 3,280 |
| Sweden | (4) | 4 | 4,990 | 45,400 | 9 | 98 | -- | -- | -- | -- |
| Taiwan | 1 | 24 | 230 | 2,310 | 150 | 1,050 | 70 | 951 | 2,690 | 5,780 |
| Turkey | -- | -- | (4) | 5 | 13 | 108 | 6,730 | 57,700 | -- | -- |
| United Kingdom | 1 | 18 | 545 | 4,410 | 36 | 297 | 1 | 69 | 20 | 48 |
| Other | 23 | 234 | 1,370 | 11,900 | 1,100 | 13,300 | 1,680 | 17,400 | 482 | 953 |
| Total | 4,120 | 34,900 | 57,600 | 521,000 | 114,000 | 873,000 | 10,200 | 91,200 | 48,000 | 107,000 |

-- 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 2009 were 113,000 metric tons (t) valued at $545 million, and in 2010, wire rod imports were 105,000 t valued at $789 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 | | | |
|---|---|---|---|---|---|---|---|---|
| | 2009 | | 2010 | | 2009 | | 2010 | |
| Country | Quantity (metric tons) | Value (thousands) | Quantity (metric tons) | Value (thousands) | Quantity (metric tons) | Value (thousands) | Quantity (metric tons) | Value (thousands) |
| Belgium | 2,160 | $7,750 | 11,000 | $52,600 | 14,900 | $31,800 | 19,900 | $66,600 |
| Canada | 6,320 | 34,800 | 15,500 | 109,000 | 32,300 | 91,500 | 29,900 | 110,000 |
| China | 190,000 | 617,000 | 247,000 | 1,060,000 | 416,000 | 693,000 | 512,000 | 1,300,000 |
| Germany | 1,510 | 6,510 | 4,190 | 25,500 | 6,600 | 31,900 | 9,570 | 54,500 |
| Hong Kong | 15,600 | 63,100 | 10,300 | 53,500 | 37,400 | 85,600 | 44,500 | 158,000 |
| India | 356 | 1,480 | 965 | 5,960 | 11,100 | 23,200 | 17,900 | 40,700 |
| Japan | 3,220 | 15,900 | 7,180 | 48,600 | 10,200 | 46,200 | 9,900 | 58,500 |
| Korea, Republic of | 8,400 | 36,500 | 13,300 | 88,200 | 21,500 | 48,800 | 17,600 | 63,400 |
| Mexico | 1,580 | 8,770 | 4,090 | 25,400 | 9,990 | 41,300 | 7,090 | 49,900 |
| Taiwan | 6,980 | 23,300 | 2,940 | 17,000 | 6,510 | 5,680 | 2,790 | 8,500 |
| Other | 8,420 | 40,900 | 16,700 | 101,000 | 31,200 | 52,300 | 28,800 | 57,100 |
| Total | 245,000 | 856,000 | 334,000 | 1,590,000 | 598,000 | 1,150,000 | 699,000 | 1,960,000 |

[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]

| | Unalloyed copper scrap | | Copper-alloy scrap | | |
|---|---|---|---|---|---|
| Country or territory | Quantity (metric tons) | Value[2] (thousands) | Gross weight (metric tons) | Copper content [3] (metric tons) | Value[2] (thousands) |
| 2009 | 16,300 | $52,000 | 55,500 | 40,000 | $185,000 |
| 2010: | | | | | |
| Canada | 9,010 | 53,500 | 32,500 | 23,400 | 156,000 |
| Chile | -- | -- | 80 | 58 | 318 |
| Costa Rica | 867 | 3,520 | 2,100 | 1,510 | 9,440 |
| Dominican Republic | 628 | 1,180 | 856 | 616 | 1,230 |
| Guatemala | 651 | 1,290 | 1,070 | 770 | 3,710 |
| Honduras | 20 | 143 | 701 | 504 | 3,520 |
| Jamaica | 237 | 535 | 361 | 260 | 620 |
| Mexico | 5,850 | 18,100 | 29,900 | 21,500 | 107,000 |
| Nicaragua | 1,270 | 2,640 | 1,330 | 958 | 2,010 |
| Peru | -- | -- | 438 | 315 | 3,200 |
| Other | 2,850 | 9,430 | 5,080 | 3,660 | 25,200 |
| Total | 21,400 | 90,400 | 74,500 | 53,600 | 313,000 |

-- 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 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Argentina | 180,144 | 180,200 | 156,893 | 143,084 | 140,318 |
| Armenia | 18,000 e | 17,600 e | 18,800 | 22,600 | 25,100 |
| Australia:[e] | | | | | |
| Concentrates | 806,400 [3] | 828,000 | 833,000 | 831,000 | 856,000 |
| Leaching, electrowon | 52,400 [3] | 42,000 | 53,000 | 23,000 | 14,400 |
| Total | 858,800 [3] | 870,000 | 886,000 | 854,000 | 870,000 |
| Bolivia | 218 | 606 | 731 | 882 r | 2,063 |
| Botswana[e] | 24,000 | 24,000 | 29,000 | 27,700 r | 31,000 |
| Brazil: | | | | | |
| Concentrates | 147,836 | 204,828 | 214,495 | 205,192 | 206,800 |
| Leaching, electrowon | -- | 900 | 3,800 | 6,500 | 7,400 |
| Total | 147,836 | 205,728 | 218,295 r | 211,692 r | 214,200 |
| Bulgaria | 110,000 | 110,000 r | 105,000 r | 105,000 r | 105,000 |
| Burma, leaching, electrowon | 19,500 | 13,900 r | -- r | 3,500 r | 12,000 |
| Canada: | | | | | |
| Concentrates | 603,295 | 594,749 | 605,399 | 493,700 r | 522,000 |
| Leaching, electrowon | -- | 1,500 | 1,600 | 800 | 3,000 |
| Total | 603,295 | 596,249 | 606,999 | 494,500 r | 525,000 |
| Chile:[4] | | | | | |
| Concentrates | 3,669,000 | 3,724,900 | 3,356,600 | 3,276,900 | 3,330,400 |
| Leaching, electrowon | 1,691,800 | 1,832,100 | 1,971,000 | 2,117,500 r | 2,088,500 |
| Total | 5,360,800 | 5,557,000 | 5,327,600 | 5,394,400 r | 5,418,900 |
| China:[e] | | | | | |
| Concentrates | 873,000 | 928,000 | 1,070,000 r | 1,040,000 r | 1,160,000 |
| Leaching, electrowon | 16,000 | 18,000 | 20,000 | 25,000 | 35,000 |
| Total | 889,000 | 946,000 | 1,090,000 r | 1,070,000 r | 1,200,000 |
| Colombia | 725 | 1,050 | 1,310 | 1,420 | 1,000 |
| Congo (Kinshasa):[5] | | | | | |
| Concentrates[e] | 91,000 r | 116,000 r | 189,000 r | 155,000 r | 118,000 |
| Leaching, electrowon | 53,285 | 32,099 r | 44,742 r | 154,751 r | 262,000 e |
| Total | 144,285 r | 148,099 r | 233,742 r | 309,751 r | 380,000 e |
| Cyprus, leaching, electrowon[e] | -- | 300 | 300 | 300 | 300 |
| Dominican Republic | -- | -- | 2,600 | 11,500 | 9,200 |
| Finland | 13,316 | 13,646 | 13,440 | 14,600 r | 14,700 |
| Georgia[e] | 9,000 | 11,000 | 11,000 | 11,000 | 6,100 |
| India | 27,400 | 33,900 | 30,600 | 29,500 r | 33,000 |
| Indonesia[5] | 818,000 | 796,900 | 632,600 | 998,530 r | 872,300 |
| Iran: | | | | | |
| Concentrates | 208,000 | 241,000 | 241,000 | 255,000 | 250,000 |
| Leaching, electrowon | 9,000 | 8,000 | 8,000 | 7,000 | 7,000 |
| Total | 217,000 | 249,000 | 249,000 | 262,000 | 257,000 |
| Kazakhstan | 434,100 r | 406,800 r | 421,700 r | 406,100 r | 380,000 |
| Korea, North[e] | 12,000 | 12,000 | 12,000 | 12,000 | 12,000 |
| Korea, Republic of | 3 r | 6 r | 4 r | 14 r | 9 |
| Laos: | | | | | |
| Concentrates | -- | -- | 24,929 | 54,019 | 67,806 |
| Leaching, electrowon | 60,803 | 62,541 | 64,075 | 67,561 | 64,241 |
| Total | 60,803 | 62,541 | 89,004 | 121,580 | 132,047 |

See footnotes at end of table.

TABLE 20—Continued

COPPER: WORLD MINE PRODUCTION, BY COUNTRY[1, 2]

(Metric tons)

| Country | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Macedonia | 7,000 r | 7,400 r | 8,400 r | 7,600 r | 7,900 |
| Mauritania | 5,031 | 31,956 | 33,073 | 35,000 | 37,000 |
| Mexico: | | | | | |
| Concentrates | 280,840 r | 276,530 r | 214,644 r | 170,597 | 190,136 |
| Leaching, electrowon | 46,696 r | 58,972 r | 53,975 r | 57,151 | 80,000 |
| Total | 327,536 | 335,502 r | 268,619 r | 227,748 | 270,136 |
| Mongolia | 129,693 | 130,160 | 126,800 | 129,800 | 126,100 |
| Morocco | 4,600 | 5,572 | 5,600 | 11,800 r | 11,200 |
| Namibia | 6,262 | 6,580 | 7,471 | -- | -- |
| Pakistan | 19,100 | 18,800 | 18,700 | 18,500 | 18,000 |
| Papua New Guinea | 194,355 | 169,184 | 159,650 | 166,700 | 159,800 |
| Peru: | | | | | |
| Concentrates | 874,601 | 1,018,156 | 1,107,789 | 1,113,449 r | 1,094,184 |
| Leaching, electrowon | 173,871 | 172,118 | 160,078 | 162,800 r | 153,000 |
| Total | 1,048,472 | 1,190,274 | 1,267,867 | 1,276,249 r | 1,247,184 |
| Philippines | 17,161 | 22,862 | 21,235 | 49,060 | 58,412 |
| Poland | 497,000 | 452,000 | 429,000 | 439,000 r | 425,400 |
| Portugal | 78,660 | 90,247 | 89,070 | 86,900 | 74,300 |
| Romania[e, 6] | 12,132 [3] | 2,213 [3] | 2,000 r | 1,000 r | 1,000 |
| Russia[e] | 725,000 | 740,000 | 750,000 | 676,000 r | 703,000 |
| Saudi Arabia | 730 | 750 e | 1,465 | 2,000 | 2,000 e |
| Serbia | 12,000 | 16,500 | 18,800 | 19,000 | 19,000 e |
| South Africa | 89,500 | 97,000 | 108,700 r | 107,600 r | 102,600 |
| Spain: | | | | | |
| Concentrates | 6,616 | 6,281 | 7,071 | 15,400 | 15,000 |
| Leaching, electrowon | -- | -- | -- | 5,600 | 5,600 e |
| Total | 6,616 | 6,281 | 7,071 | 21,000 | 20,600 |
| Sweden | 86,800 r | 62,800 r | 57,220 r | 54,602 r | 75,977 |
| Tanzania, in concentrates and bullion | 3,284 | 3,275 | 2,852 r | 2,319 r | 5,326 |
| Turkey[e, 6] | 70,000 r | 81,000 | 100,000 r | 105,000 r | 97,000 |
| United States:[5] | | | | | |
| Concentrates | 667,000 | 665,000 | 801,000 | 705,000 | 679,000 |
| Leaching, electrowon | 530,000 | 504,000 | 507,000 | 476,000 | 430,000 |
| Total | 1,200,000 | 1,170,000 | 1,310,000 | 1,180,000 | 1,110,000 |
| Uzbekistan | 100,000 | 95,000 | 95,000 | 95,000 | 90,000 |
| Zambia: | | | | | |
| Concentrates[e] | 350,000 | 341,000 | 392,000 r | 557,000 r | 540,000 |
| Leaching, electrowon[e] | 124,000 | 168,000 | 163,000 | 140,000 r | 150,000 |
| Total | 474,000 | 509,000 | 555,000 r | 697,000 r | 690,000 |
| Zimbabwe, concentrates | 2,581 | 2,681 r | 2,827 r | 3,572 r | 4,000 e |
| Grand total | 15,100,000 | 15,500,000 | 15,600,000 r | 15,900,000 | 16,000,000 |
| Of which: | | | | | |
| Concentrates | 12,300,000 | 12,600,000 | 12,500,000 r | 12,700,000 r | 12,700,000 |
| Leaching, electrowon | 2,780,000 r | 2,910,000 r | 3,050,000 r | 3,250,000 | 3,310,000 |

See footnotes at end of table.

TABLE 20—Continued

COPPER: WORLD MINE PRODUCTION, BY COUNTRY[1, 2]

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

[1]World 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 by analysis of concentrates produced (includes cement copper, if applicable), except where otherwise noted. Table includes data available through July 28, 2011.

[3]Reported figure.

[4]Reported by Comision Chilena del Cobre. Includes recoverable copper content of nonduplicative mine and metal products produced from domestic ores and concentrates and leach production for electrowinning.

[5]Recoverable content.

[6]Excludes copper content of pyrite.

TABLE 21

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

(Metric tons, gross weight)

| Country | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Armenia, primary | 8,791 | 6,954 | 6,480 | 6,858 | 7,500 |
| Australia, primary | 377,000 | 399,000 | 449,000 | 422,000 | 410,000 |
| Austria, secondary | 65,900 | 80,200 | 94,200 | 90,800 | 92,200 p |
| Belgium, secondary | 114,600 | 115,000 e | 124,500 | 114,400 | 118,600 |
| Botswana, primary[3] | 24,255 | 19,996 | 23,146 | 24,382 | 24,000 e |
| Brazil: | | | | | |
| Primary | 179,700 | 178,367 | 184,400 r | 176,000 | 176,400 |
| Secondary[e] | 40,000 | 40,000 | 39,100 r | 31,000 | 47,700 |
| Total | 219,700 | 218,367 | 223,500 r | 207,000 | 224,100 |
| Bulgaria: | | | | | |
| Primary | 217,000 | 217,600 | 257,100 | 256,200 | 265,000 |
| Secondary[e] | 24,000 | 11,500 | 21,200 | 20,000 | 19,600 |
| Total | 241,000 | 229,100 | 278,300 | 276,200 | 284,600 |
| Canada: | | | | | |
| Primary | 484,675 | 470,713 | 443,798 | 316,510 | 318,000 |
| Secondary | 35,826 | 46,101 | 41,777 | 29,733 | 31,800 |
| Total | 520,501 | 516,814 | 485,575 | 346,243 | 349,800 |
| Chile, primary | 1,565,400 | 1,514,300 | 1,369,200 | 1,522,300 | 1,559,800 |
| China:[e] | | | | | |
| Primary | 1,920,000 | 2,110,000 | 2,500,000 | 2,700,000 r | 2,800,000 |
| Secondary | 700,000 | 800,000 | 870,000 | 1,100,000 | 1,300,000 |
| Total | 2,620,000 | 2,910,000 | 3,370,000 | 3,800,000 r | 4,100,000 |
| Congo (Kinshasa), primary, electrowon | 10,000 e | 1,800 | -- | -- | -- |
| Finland: | | | | | |
| Primary | 162,300 | 141,000 | 172,354 | 137,710 | 149,000 e |
| Secondary[e] | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Total | 164,300 | 143,000 | 174,354 | 139,710 | 151,000 e |
| Germany: | | | | | |
| Primary | 273,800 | 270,200 | 295,000 | 286,300 r | 378,700 |
| Secondary | 266,300 | 273,400 | 293,300 | 247,500 r | 212,400 |
| Total | 540,100 | 543,600 | 588,300 | 533,800 r | 591,100 |
| India: | | | | | |
| Primary | 610,000 | 700,000 | 651,000 | 705,100 | 654,000 |
| Secondary[e] | 15,000 | 15,000 | 11,000 | 10,000 | 2,000 |
| Total | 625,000 | 715,000 | 662,000 | 715,100 | 656,000 |
| Indonesia, primary | 201,200 | 277,100 | 253,300 | 295,900 | 276,800 |
| Iran:[e] | | | | | |
| Primary | 177,000 | 180,000 | 180,000 | 193,000 | 190,000 |
| Secondary | 65,000 | 70,000 | 68,000 | 67,000 | 90,000 |
| Total | 242,000 | 250,000 | 248,000 | 260,000 | 280,000 |
| Japan: | | | | | |
| Primary | 1,409,087 | 1,367,310 | 1,366,310 | 1,297,943 | 1,382,700 |
| Secondary | 219,203 | 245,208 | 259,060 | 243,859 | 260,200 |
| Total | 1,628,290 | 1,612,518 | 1,625,370 | 1,541,802 | 1,642,900 |
| Kazakhstan, undifferentiated | 426,200 r | 392,834 | 392,575 | 369,000 | 370,900 |
| Korea, North, undifferentiated[e] | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |

See footnotes at end of table.

TABLE 21—Continued

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

(Metric tons, gross weight)

| Country | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Korea, Republic of: | | | | | |
| Primary[e] | 450,000 | 470,000 | 502,000 [r] | 455,000 | 476,000 |
| Secondary[e] | 35,000 [r] | 45,000 | 42,000 [r] | 44,000 | 65,000 |
| Total | 485,000 [r] | 515,000 | 544,000 [r] | 499,000 | 541,000 |
| Mexico: | | | | | |
| Primary | 260,200 | 222,600 | 200,200 | 153,700 | 153,000 [e] |
| Secondary[e] | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Total | 265,200 | 227,600 | 205,200 | 158,700 | 158,000 [e] |
| Namibia, primary[e, 4] | 22,000 | 21,000 | 16,271 [5] | 21,500 [r, 5] | 20,000 |
| Oman, primary | 20,710 | 13,940 | 11,906 | 12,000 [e] | 14,000 |
| Pakistan, primary[e] | 23,600 | 18,200 | 17,800 | 17,500 | 17,000 |
| Peru, primary | 381,300 | 296,100 | 360,400 | 341,500 [r] | 312,968 |
| Philippines, primary | 239,600 | 220,000 | 239,700 [r] | 230,100 | 216,200 |
| Poland: | | | | | |
| Primary | 445,100 [r] | 438,100 | 438,600 | 427,800 [r] | 452,200 |
| Secondary | 80,000 | 40,000 | 43,900 | 68,800 | 94,300 |
| Total | 525,100 [r] | 478,100 | 482,500 | 496,600 [r] | 546,500 |
| Russia:[e] | | | | | |
| Primary | 635,000 | 650,000 | 630,000 | 580,000 | 590,000 |
| Secondary | 312,000 | 290,000 | 235,000 | 220,000 | 240,000 |
| Total | 947,000 | 940,000 | 865,000 | 800,000 | 830,000 |
| Serbia:[e] | | | | | |
| Primary | 40,000 | 30,200 | 31,900 | 32,000 | 35,000 |
| Secondary | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Total | 41,000 | 31,200 | 32,900 | 33,000 | 36,000 |
| Slovakia, secondary | 22,000 [e] | 20,600 [e] | 27,500 | 34,200 | 46,500 |
| South Africa, primary | 98,900 [r] | 111,900 [r] | 94,800 [r] | 86,900 [r] | 75,900 |
| Spain: | | | | | |
| Primary | 263,100 | 249,400 | 256,900 | 261,000 | 236,000 |
| Secondary[e] | 6,482 [5] | 6,700 | 3,000 | 4,000 | 19,000 |
| Total | 269,582 | 256,100 | 259,900 | 265,000 | 255,000 |
| Sweden: | | | | | |
| Primary | 138,800 | 132,500 | 128,500 | 126,000 | 137,000 |
| Secondary[e] | 55,000 | 46,500 | 53,800 | 39,600 | 42,000 |
| Total | 193,800 | 179,000 | 182,300 | 165,600 | 179,000 |
| Thailand: | | | | | |
| Primary | 25,300 [r] | 11,900 [r] | -- | -- | -- |
| Secondary | 1,750 [r] | 814 [r] | -- | -- | -- |
| Total | 27,050 [r] | 12,714 [r] | -- | -- | -- |
| Turkey, undifferentiated[e, 6] | 30,000 | 30,000 | 35,000 | 30,000 | 30,000 |
| United States, undifferentiated | 501,000 | 617,000 | 574,000 | 597,000 | 601,000 |
| Uzbekistan, undifferentiated[e] | 95,000 | 92,000 | 92,000 | 92,000 | 92,000 |
| Vietnam, primary[e] | 4,800 [r, 5] | 11,000 [r, 5] | 2,200 | 6,000 | 8,000 |
| Zambia, primary | 290,000 | 224,000 | 232,000 [e] | 334,000 | 490,000 |

See footnotes at end of table.

TABLE 21—Continued

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

(Metric tons, gross weight)

| Country | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Grand total: | 14,100,000 | 14,300,000 | 14,700,000 | 14,900,000 r | 15,600,000 |
| Of which | | | | | |
| Primary: | | | | | |
| Electrowon | 10,000 e | 1,800 | -- | -- | -- |
| Other | 10,900,000 r | 11,000,000 r | 11,300,000 r | 11,400,000 r | 11,800,000 |
| Secondary | 2,070,000 r | 2,150,000 r | 2,240,000 r | 2,370,000 r | 2,690,000 |
| Undifferentiated | 1,070,000 r | 1,150,000 r | 1,110,000 r | 1,100,000 r | 1,110,000 |

eEstimated. pPreliminary. rRevised. -- Zero.

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

[2]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, 2011.

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

[4]Includes 8,000 to 10,000 metric tons per year for 2006 produced from imported toll concentrates.

[5]Reported figure.

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

TABLE 22

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

(Metric tons)

| Country | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Argentina, secondary[e] | 16,000 | 16,000 | 16,000 | 16,000 | 16,000 |
| Australia, primary: | | | | | |
| Electrowon | 52,400 | 42,000 | 53,000 | 23,000 | 14,000 |
| Other | 377,000 | 400,000 | 450,000 | 423,000 | 403,000 |
| Total | 429,400 | 442,000 | 503,000 | 446,000 | 417,000 |
| Austria, secondary | 72,600 | 81,400 | 106,700 | 96,200 | 113,700 [p] |
| Belgium: | | | | | |
| Primary[3] | 238,000 [e] | 228,500 | 233,100 | 220,600 | 216,000 |
| Secondary | 153,000 | 165,600 | 162,700 | 153,100 | 165,000 |
| Total | 391,000 [e] | 394,100 | 395,800 | 373,700 | 381,000 |
| Brazil: | | | | | |
| Primary: | | | | | |
| Electrowon | -- [r] | 900 [r] | 3,800 [r] | 6,500 [r] | 7,400 |
| Other | 192,700 [r] | 194,380 [r] | 204,375 [r] | 193,899 [r] | 177,800 |
| Total | 192,700 [r] | 195,280 [r] | 208,175 [r] | 200,399 [r] | 185,200 |
| Secondary | 27,000 | 24,000 | 25,633 | 31,000 | 47,700 |
| Total, primary and secondary | 219,700 [r] | 219,280 [r] | 233,808 [r] | 231,399 [r] | 232,900 |
| Bulgaria: | | | | | |
| Primary | 60,700 [r] | 64,400 [r] | 114,200 [r] | 183,600 | 195,400 |
| Secondary[e] | 4,800 [r] | 5,700 [r] | 12,600 [r] | 13,200 | 19,600 |
| Total | 65,500 [r] | 70,100 [r] | 126,800 [r] | 196,800 | 215,000 |
| Burma, electrowon | 19,500 | 15,100 | -- | 5,000 [r] | 12,000 [e] |
| Canada: | | | | | |
| Primary | 465,000 | 407,000 | 400,000 | 305,296 | 280,000 |
| Secondary | 36,000 | 46,000 | 42,000 | 30,600 | 32,000 |
| Total | 501,000 | 453,000 | 442,000 | 335,896 | 312,000 |
| Chile, primary: | | | | | |
| Electrowon | 1,691,800 | 1,832,100 | 1,971,000 | 2,117,500 [r] | 2,088,500 |
| Other | 1,119,500 | 1,104,400 | 1,086,600 | 1,159,100 | 1,155,400 |
| Total | 2,811,300 | 2,936,500 | 3,057,600 | 3,276,600 [r] | 3,243,900 |
| China:[e] | | | | | |
| Primary: | | | | | |
| Electrowon | 20,000 | 20,000 | 20,000 | 17,000 [r] | 35,000 |
| Other | 2,000,000 | 2,280,000 | 2,680,000 | 2,750,000 | 2,950,000 |
| Total | 2,020,000 | 2,300,000 | 2,700,000 | 2,770,000 [r] | 2,990,000 |
| Secondary | 1,000,000 | 1,200,000 | 1,200,000 | 1,400,000 | 1,700,000 |
| Total, primary and secondary | 3,020,000 | 3,500,000 | 3,900,000 | 4,170,000 [r] | 4,690,000 |
| Congo (Kinshasa), electrowon | -- | 6,897 [r] | 38,632 [r] | 154,671 [r] | 235,204 |
| Cyprus, electrowon | 1,000 | 2,900 | 2,986 | 2,380 | 2,400 [e] |
| Egypt, secondary | 1,719 [r] | 2,664 [r] | 2,842 [r] | 3,000 [r] | 3,000 [e] |
| Finland: | | | | | |
| Primary | 120,674 | 100,987 | 127,952 | 95,549 | 112,000 [e] |
| Secondary[e] | 16,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| Total | 136,674 | 110,987 | 137,952 | 105,549 | 122,000 [e] |
| Germany: | | | | | |
| Primary | 312,092 | 301,702 | 300,470 | 290,200 | 346,300 [p] |
| Secondary | 350,246 | 363,815 | 389,300 | 378,745 [r] | 347,300 [p] |
| Total | 662,338 | 665,517 | 689,770 | 668,945 [r] | 693,600 [p] |

See footnotes at end of table.

TABLE 22—Continued

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

(Metric tons)

| Country | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Hungary, secondary[e] | 10,000 | 10,000 | -- | -- | -- |
| India: | | | | | |
| Primary, electrolytic | 614,000 | 698,600 | 654,200 | 705,100 | 654,900 |
| Secondary[e] | 15,000 | 15,000 | 15,000 | 10,000 | 2,000 |
| Total | 629,000 | 713,600 | 669,200 | 715,100 | 656,900 |
| Indonesia, primary | 217,600 | 277,000 | 254,000 | 289,200 | 278,200 |
| Iran: | | | | | |
| Primary:[e] | | | | | |
| Electrowon | 9,000 | 8,000 | 7,000 | 7,000 | 7,000 |
| Other | 140,000 | 141,000 [r] | 140,000 | 150,000 | 143,000 |
| Total | 149,000 | 149,000 [r] | 147,000 | 157,000 | 150,000 |
| Secondary | 51,000 [r] | 52,000 [r] | 53,000 | 53,000 | 70,000 |
| Total, primary and secondary | 200,000 [r] | 201,000 [r] | 200,000 | 210,000 | 220,000 |
| Italy, secondary[e] | 36,400 [4] | 28,600 [4] | 24,200 | 6,500 | 6,500 |
| Japan: | | | | | |
| Primary | 1,342,350 | 1,369,814 | 1,328,157 | 1,238,012 | 1,333,800 |
| Secondary | 189,705 | 207,004 | 211,681 | 201,831 | 214,900 |
| Total | 1,532,055 | 1,576,818 | 1,539,838 | 1,439,843 | 1,548,700 |
| Kazakhstan, primary | 427,723 | 406,091 | 398,411 [r] | 368,113 [r] | 323,428 |
| Korea, North, primary[e] | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Korea, Republic of: | | | | | |
| Primary | 541,500 [r] | 536,467 [r] | 492,925 [r] | 441,401 [r] | 467,600 |
| Secondary | 34,000 | 45,000 | 45,000 [r] | 90,300 [r] | 97,000 |
| Total | 575,500 [r] | 581,467 [r] | 537,925 [r] | 531,701 [r] | 564,600 |
| Laos, electrowon | 60,803 | 62,541 | 64,075 [r] | 67,561 [r] | 64,241 |
| Mexico: | | | | | |
| Primary: | | | | | |
| Electrowon | 89,076 | 107,000 | 74,500 | 65,700 [e] | 80,000 [e] |
| Other | 284,300 | 238,900 | 215,500 | 190,000 [e] | 192,600 |
| Total | 373,376 | 345,900 | 290,000 | 255,700 | 272,600 |
| Secondary[e] | 6,000 | 6,000 | 6,000 | 5,000 | 5,000 |
| Total, primary and secondary | 379,376 | 351,900 | 296,000 | 260,700 | 277,600 |
| Mongolia, electrowon | 2,618 | 3,007 | 2,587 | 2,470 | 2,750 |
| Norway, primary[5] | 38,500 [e] | 43,000 | 32,000 | 30,000 | 30,000 |
| Oman, primary | 21,000 | 14,000 | 12,000 | 12,000 | 14,000 |
| Peru, primary: | | | | | |
| Electrowon | 173,871 | 172,118 | 160,078 | 157,082 [r] | 153,022 |
| Other | 333,839 | 241,789 | 303,855 | 260,618 [r] | 240,616 |
| Total | 507,710 | 413,907 | 463,933 | 417,700 [r] | 393,638 |
| Philippines, primary | 181,000 | 160,200 | 174,600 [r] | 178,000 [r] | 171,900 |
| Poland: | | | | | |
| Primary | 476,100 | 493,200 | 483,000 | 433,600 [r] | 452,700 |
| Secondary | 80,500 | 39,800 | 43,800 [r] | 68,800 [r] | 94,300 |
| Total | 556,600 | 533,000 | 526,800 [r] | 502,400 [r] | 547,000 |

See footnotes at end of table.

TABLE 22—Continued

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

(Metric tons)

| Country | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Romania: | | | | | |
| Primary | 18,583 | 15,584 | 10,323 | 3,000 [r] | 3,000 [e] |
| Secondary[e] | 3,000 | 3,000 | 3,000 | 1,000 [r] | 1,000 |
| Total | 21,583 | 18,584 | 13,323 | 4,000 [r] | 4,000 [e] |
| Russia: | | | | | |
| Primary | 635,000 | 650,000 | 610,000 | 612,000 [r] | 656,000 |
| Secondary | 312,000 | 289,000 | 250,000 | 250,000 [r] | 218,000 |
| Total | 947,000 | 939,000 | 860,000 | 862,000 [r] | 874,000 |
| Serbia: | | | | | |
| Primary | 40,000 | 30,600 | 32,800 | 33,000 | 34,000 |
| Secondary[e] | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Total | 41,000 | 31,600 | 33,800 | 34,000 | 35,000 |
| South Africa, primary[5] | 104,052 | 113,166 | 92,972 | 89,451 | 82,202 |
| Spain: | | | | | |
| Primary: | | | | | |
| Electrowon | -- | -- | -- | 5,600 [r] | 28,500 |
| Other | 235,300 | 243,000 | 257,000 | 250,200 [r] | 236,000 |
| Total | 235,300 | 243,000 | 257,000 | 255,800 [r] | 264,500 |
| Secondary[e] | 64,000 | 65,000 | 62,000 | 73,000 [r] | 82,900 |
| Total, primary and secondary | 299,300 | 308,000 | 319,000 | 328,800 [r] | 347,400 |
| Sweden: | | | | | |
| Primary | 187,800 | 175,500 | 184,674 | 164,759 | 150,497 |
| Secondary | 41,200 | 38,500 | 43,100 | 41,000 | 40,000 [e] |
| Total | 229,000 | 214,000 | 227,774 | 205,759 | 190,497 |
| Taiwan, secondary[e] | 4,500 | 4,500 | 4,500 | 4,500 | 4,500 |
| Thailand: | | | | | |
| Primary | 25,300 | 11,900 | -- | -- | -- |
| Secondary | 1,750 | 814 | 438 | 490 [r] | 500 |
| Total | 27,050 | 12,714 | 438 | 490 [r] | 500 |
| Turkey:[e] | | | | | |
| Primary | 101,000 | 94,600 | 83,000 | 30,000 | 50,000 |
| Secondary | 5,000 | 5,000 | 5,000 | 4,000 | 5,000 |
| Total | 106,000 | 99,600 | 88,000 | 34,000 | 55,000 |
| Ukraine, secondary[e] | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| United States: | | | | | |
| Primary: | | | | | |
| Electrowon | 530,000 | 504,000 | 507,000 | 476,000 | 430,000 |
| Other | 675,000 | 764,000 | 713,000 | 636,000 | 627,000 |
| Total | 1,210,000 | 1,270,000 | 1,220,000 | 1,110,000 | 1,060,000 |
| Secondary | 44,800 | 46,000 | 53,800 | 46,400 | 37,700 |
| Total, primary and secondary | 1,250,000 | 1,310,000 | 1,270,000 | 1,160,000 | 1,090,000 |
| Uzbekistan, primary | 92,300 | 89,655 | 71,000 | 80,000 | 90,000 |
| Vietnam, primary | -- | -- | -- | 6,000 [e] | 6,000 [e] |
| Zambia, primary:[e] | | | | | |
| Electrowon[6] | 178,000 | 200,000 | 175,000 | 145,400 [4] | 160,000 |
| Other | 240,000 | 230,000 | 240,000 | 269,000 [4] | 370,000 |
| Total | 418,000 | 430,000 | 415,000 | 414,400 [4] | 530,000 |

See footnotes at end of table.

TABLE 22—Continued

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

(Metric tons)

| Country | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Zimbabwe, primary[e] | 7,000 | 6,798 [4] | 3,072 [4] | 3,000 | 5,000 |
| Grand total | 17,300,000 | 17,900,000 | 18,300,000 | 18,400,000 | 19,100,000 |
| Of which: | | | | | |
| Primary: | | | | | |
| Electrowon | 2,830,000 | 2,980,000 | 3,080,000 | 3,250,000 | 3,320,000 |
| Other | 11,900,000 | 12,100,000 [r] | 12,400,000 | 12,100,000 [r] | 12,500,000 |
| Total | 14,700,000 | 15,100,000 | 15,500,000 | 15,400,000 | 15,800,000 |
| Secondary | 2,600,000 [r] | 2,790,000 [r] | 2,810,000 [r] | 3,010,000 [r] | 3,350,000 |

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

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

[2]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, 2011.

[3]Includes reprocessed leach cathode from Congo (Kinshasa).

[4]Reported figure.

[5]May include secondary.

[6]Electrowon covers only high-grade electrowon cathodes reported as “finished production leach cathodes.”