Copper

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The decline in prices that began in the third quarter of 2000 continued through most of 2001. A sharp drop in economic activity in most of the major copper-using regions (the United States, Europe and Asia) led to a corresponding drop in demand for copper. While global growth in demand for copper in 2000 was a very healthy 7.0%, demand in 2001 declined by 6.4%. This compares to an average growth in demand over the past 30 years of 2.3% per year. The supply of refined copper grew by 4.4% in 2001 compared with much lower growth of 1.9% in 2000. These market fundamentals contributed to a large swing in the refined metal balance from a deficit of 508 000 t at the end of 2000 to a surplus of 696 000 t at the end of 2001. The cash settlement price for Grade A copper averaged US$1583/t (US71.8¢/lb) in 2001, 13% below the average price in 2000.

CANADIAN DEVELOPMENTS

Canadian mine production of copper (recoverable copper in concentrate) is expected to total approximately 633 000 t in 2001, nearing the 2000 level of 634 000 t. Mine production in 2002 is forecast to total 606 000 t. The anticipated decline in output is mainly attributable to announced suspensions and/or closures taking effect in 2001 and 2002 (see below). In 2001, Canada ranked sixth in the world in terms of mine production (Table 3). This downward trend in mine production is forecast to continue over the next few years as no new mines are expected to come on stream given the current price profile, while output at existing mines is forecast to decline. The Natural Resources Canada publication entitled *Overview of Trends in Canadian Mineral Exploration, 2001*, provides a thorough analysis of trends in exploration in Canada and is available on the Internet at www.nrcan.gc.ca/mms/efab/invest/exploration/default.html.

Refined copper production is expected to grow by 2.5% to 565 000 t in 2001 and by a further 4.8% to 592 000 t in 2002. The rise in production is attributable to a planned increase in output at Falconbridge Limited's Kidd Creek refinery following completion of an expansion that has raised capacity to 147 000 t/y.

Canadian refined copper use is expected to total 265 000 t in 2001, a 3.3% decline from the 2000 total of 274 000 t (Table 5). Refined use is forecast to increase by 10% to 301 000 t in 2002. The expected rise in demand stems from growing demand for power cable and building wire coming from the oil and gas and pulp and paper industries, strong demand for use in new housing construction, and an incremental expansion at Nexan's wire rod facility in Montréal-Est.

- In April, Teck Corporation and Cominco Ltd. announced that the two companies would merge. Teck Cominco Limited was formed in July and ranks as the fourth largest North American-based base-metal mining and refining company. The merged companies' copper assets include a 64% interest in the Highland Valley Copper mine in British Columbia, a 25% interest in the Louvicourt mine in Quebec, and a 22.5% interest in the Antamina zinc-copper mine in Peru.

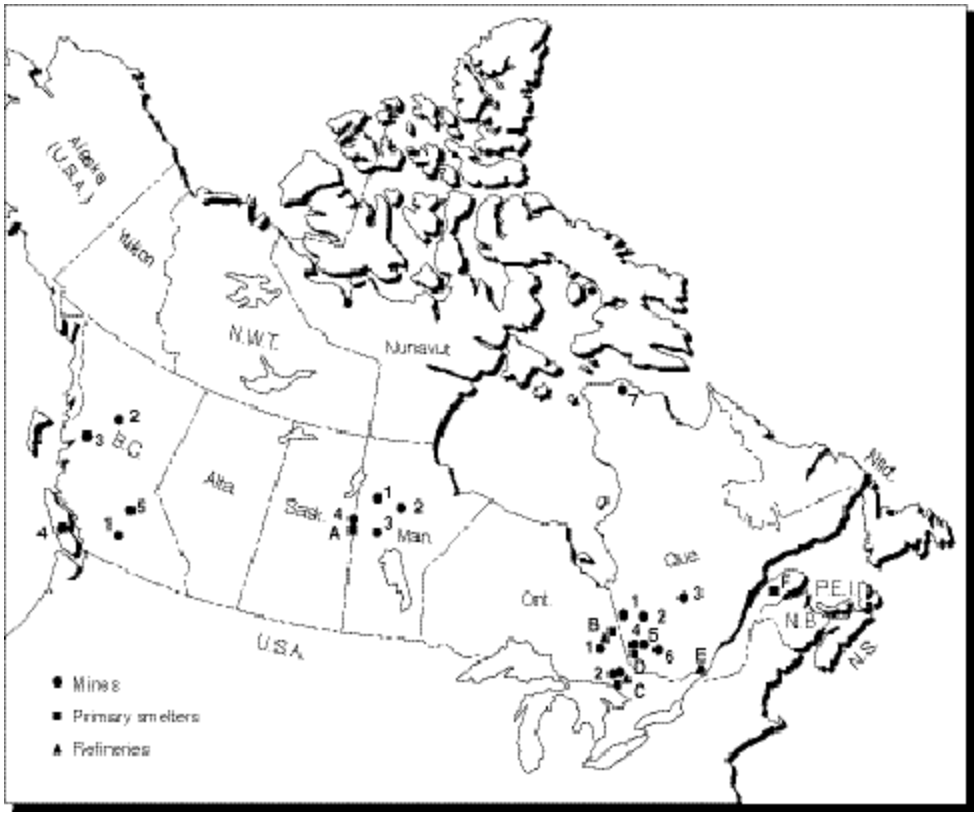
- In July 2001, Imperial Metals Corporation announced plans to suspend production at its Mount Polley copper-gold operations in British Columbia on September 30, 2001, due to low metal prices.

- In October 2001, Hudson Bay Mining and Smelting Co., Limited announced it will permanently close the Ruttan zinc-copper mine in northern Manitoba no later than May 2002. Low metal prices, a slowing world economy and a poor economic outlook were the reasons cited for the closure. The Ruttan mine produces approximately 13 500 t/y of copper in concentrate.

- Also in October 2001, Boliden AB announced a three-month suspension of production at its Myra Falls zinc-copper mine in British Columbia beginning on December 3 in response to low metal prices. The mine produces 15 000 t/y of copper in concentrate.

Figure 1

Copper Producers in Canada, 2001



Numbers refer to locations on map above.

MINES

BRITISH COLUMBIA

1. Highland Valley Copper
2. Northgate Exploration Limited (Kemess)
3. Imperial Metals Corporation (Huckleberry)
4. Boliden Limited (Myra Falls)
5. Imperial Metals Corporation (Mount Polley)

SASKATCHEWAN

Hudson Bay Mining and Smelting Co., Limited (Flin Flon)

MANITOBA

1. Hudson Bay Mining and Smelting Co., Limited (Ruttan mine)
2. Inco Limited (Thompson mine)
3 Hudson Bay Mining and Smelting Co., Limited (Chisel Lake North mine)
4. Hudson Bay Mining and Smelting Co., Limited (Flin Flon area mines including Konuto Lake)

ONTARIO

1. Falconbridge Limited (Timmins)
2. Falconbridge Limited (Sudbury area)
   Inco Limited (Sudbury area)

QUEBEC

1. Les Mines Selbaie (Billiton Base Metals)
2. Noranda Inc. (Bell Allard mine)
3. Campbell Resources Inc. (Joe Mann mine)
4. Breakwater Resources Ltd. (Bouchard-Hébert mine)
5. Agnico-Eagle Mines Limited (LaRonde mine)
   Barrick Gold Corporation (Bousquet mine)
6. Aur Resources, Inc., Novicourt Inc., Teck Corporation (Louvicourt mine)
7. Falconbridge Limited (Raglan)

NEW BRUNSWICK

Noranda Inc. (Brunswick mine)

PRIMARY SMELTERS

A. Hudson Bay Mining and Smelting Co., Limited (Flin Flon)
B. Falconbridge Limited (Timmins)
C. Inco Limited (Sudbury area)
   Falconbridge Limited (Sudbury area)
D. Noranda Inc. (Noranda)
F. Noranda Inc. (Gaspé)

REFINERIES

B. Falconbridge Limited (Timmins)
C. Inco Limited (Sudbury area)
E. Noranda Inc. (CCR Division)

1 Highland Valley Copper is a partnership of Teck Cominco Limited and BHP Billiton.

- On November 30, Noranda Inc. announced that it would close its Gaspé copper smelter in Murdochville, Quebec, at the end of April 2002 for a period of at least six months. The announcement indicated that copper production from Noranda's CCR refinery in Montréal-Est, where output from the Gaspé smelter is further processed, would be reduced by 45 000 t/y from its design capacity of 360 000 t/y. Noranda advised that its decision to shut the smelter is in response to weak market conditions, high copper inventories, and metal prices and concentrate treatment charges that are at their lowest levels in 14 years.

A detailed list of copper mines in Canada is available on the Internet at www.nrcan.gc.ca/mms/efab/mmsd/minerals/copper.htm#producers.

WORLD DEVELOPMENTS

World mine production of copper increased by 2.4% to 13.6 Mt in 2001 from 13.2 Mt in 2000 (Table 3). This figure includes some of the many mine production cutbacks announced during 2001. As of the end of December 2001, temporary suspensions or reductions representing over 600 000 t of annual capacity were announced.

MINE CLOSURES/CUTBACKS ANNOUNCED IN 2001

Country	Mine	Event	Quantity (t/y)	Effective Date
Canada	Mount Polley	closure	15 000	October 2001
United States	Chino	closure	66 000	October 2001
United States	Miami	closure	45 000	October 2001
United States	Bagdad	cutback	64 000	October 2001
United States	Sierrita	cutback	45 000	October 2001
Canada	Myra Falls	closure	15 000	December 2001
Sweden	Apirsa	closure	2 500	
Canada	Ruttan	closure	17 500	by May 2003
Chile	El Indio	closure	15 000	by mid-2003
China	Tongling (6 mines)	cutback	15 000	
Zambia	Chibuluma South	closure	15 000	
Chile	Escondida	cutback	80 000	November 2001
Chile	Tintaya	closure	90 000	by January 2003
Chile	Codelco	cutback	100 000	January 2003
Chile	Los Pelambres	cutback	40 000	by January 2003
Total identified			625 000	

During 2001, world production of refined copper (which includes refined copper from both primary and recycled material) increased by 4.4% to 15.4 Mt from 14.8 Mt in 2000 (Table 4). The price decline had a negative effect on copper scrap supplies in 2001. Within the total world production of refined copper, the secondary component fell by 1.5% to 1.9 Mt.

Australia

- In March, London-based Billiton Plc and Australia's BHP Limited announced their intention to merge their operations to form a new company to be known as BHP Billiton. The merged company's assets are valued at approximately US$11 billion and it ranks as the world's fourth largest producer of copper. BHP Billiton's operations in Canada include a 33.6% partnership interest in the Highland Valley Copper (HVC) mine in British Columbia and the wholly owned Selbaie mine located in northwestern Quebec.

Chile

- Total Chilean copper mine production in 2001 was 4.7 Mt, a 3% increase over 2000 production. Chile is the world's largest copper producer and its output accounted for 35% of total world copper mine production in 2000. Approximately two thirds of 2000 output came from private-sector producers, with the remaining one third coming from the Corporacion Nacional del Cobre de Chile (Codelco-Chile), the state-owned copper producer. Planned expansions announced during 2001, anticipated new projects and further exploration should ensure that Chile maintains its dominant position in the world copper industry. These include:

Owner/Project	Comments
Codelco - Chuquicamata mine	Technological upgrade to increase capacity from 630 000 t/y to 750 000 t/y from 2004
Codelco - El Teniente mine	Colon concentrator expansion to increase capacity from 340 000 t/y to 480 000 t/y by 2003
BHP Billiton - Escondida mine	Escondida Phase IV expansion project to increase output from 400 000 t/y to 1.2 Mt/y to be completed by the end of
Codelco/Phelps Dodge - El Abra mine	Project to leach low-grade ores will raise capacity by 35 000 t to 240 000 t/y
Noranda - Altonorte smelter	Expansion from 160 000 to 290 000 t/y of copper anode and blister completed in early 2000
Alliance Copper Ltd. (Codelco/BHP Billiton) - Mansa mine	New SX/EW mine - construction to start in 2002 with first production in 2003; targeted capacity is 20 000 t/y of copper cathode

- In November, BHP Billiton announced it would reduce planned production at the Escondida mine in Chile by 10%, or approximately 80 000 t/y of copper in concentrate, effective at the end of November. The company also announced it would suspend sulphide production at the Tintaya mine, also in Chile, effective January 8, 2002, which represents 90 000 t of the mine's annual output. The company cited the serious decline in demand for copper as the rationale for the production cuts.

Peru

- Owners Noranda Inc., Teck Cominco Limited, BHP Billiton Plc and Mitsubishi Corporation announced that the Antamina copper-zinc project in northern Peru had achieved commercial production in October 2001, more than four months ahead of the original schedule of February 2002.

  At an average annual production at 305 000 t of copper in concentrates, Antamina is the eighth largest copper mine.

United States

- In response to falling copper prices, Arizona-based Phelps Dodge Corporation announced in October a series of production cutbacks and temporary closures at its U.S.-based operations that would result in a 220 000-t/y reduction in copper metal output by mid-January 2002. The reductions comprise a temporary closure of the Chino and Miami mines, a cutback of 50% at the Sierrita and Bagdad mines, and closure of the Chino smelter and Miami refinery.

- In December 2001, Asarco Incorporated announced a 29%, or 95 000-t/y, production cut at its Amarillo, Texas refinery. This follows the closure of the Chemetco smelter, a major source of copper anode to Asarco.

COPPER USAGE

World copper use declined 3.9% to 14.7 Mt in 2001 from 15.3 Mt in 2000 (this includes refined copper from both primary and recycled material). Among the major copper-using countries, usage in 2001 declined dramatically in the United States (-13%), Japan (-15%) and Germany (-13%). The notable exception to this downward trend was China, the second largest copper-using nation, which recorded an increase of 19% year on year (Table 5).

Copper's properties, particularly its high electrical and thermal conductivity, good tensile strength, elevated melting point, non-magnetic properties and resistance to corrosion, make it and its alloys very attractive for electrical transmission, water tubing, castings and heat exchangers. Copper is the most efficient conductor of electrical power, signals and heat of all the industrial metals. In Canada, more than half of the refined copper used annually is for electrical applications, mostly as wire. Copper's surface lustre also makes it attractive for sculpting, jewellery and architectural applications.

According to figures compiled by CRU International Limited, 75% of copper is used in wire and cable, of which two thirds is used in energy cables (power cables, building wire, etc.). The next largest market is magnet wire, used in cars and appliances, which has shown rapid growth in recent years. Twenty-two percent of the copper used annually is manufactured into tube, sheet and rod for use in various applications, including building construction, industrial machinery and equipment, and consumer and general products.
Table 8 presents end-use data for 1999 and 2000 for the United States, collected by the Copper Development Association Inc. (detailed copper use statistics are not collected in Canada).

For more information on the properties and uses of copper, please refer to the Copper Fact Sheet available on the Internet at www.nrcan.gc.ca/mms/efab/mmsd/minerals/copper.htm.

COPPER RECYCLING

According to World Bureau of Metal Statistics data, there were 5 Mt of scrap copper recovered in 2000. Copper scrap recovery includes both the production of recycled refined copper and the direct scrap copper used by manufacturers. The United States is the largest source of scrap copper; it is estimated that the United States recovered 1 455 000 t of scrap copper in 2000. According to annual surveys conducted by Natural Resources Canada, a total of 99 400 t of contained copper in scrap was recovered in Canada in 2000.

The useful service life of copper-containing products is estimated to be 35 years for residential housing, 30 years for electrical plants, 15 years for non-electrical machinery, 10 years in transportation applications, and generally 10 years in other end uses. Due to the long life of many consumer and industrial products containing copper, the calculation of pure recycling rates presents a challenge. The Statistical Committee of the International Copper Study Group (ICSG) is proposing to focus on obtaining more reliable and comprehensive statistics on the production and use of scrap copper. In Canada, Statistics Canada and Natural Resources Canada are working jointly to improve data on metals recycling. New recycling data for the major metals recycled in Canada, including copper, will be available in early 2003 for reference year 2001.

Scrap copper competes directly with primary forms. Smelters and refineries can, to some extent, substitute scrap for concentrate or blister copper. Foundries and other users may use either primary refined copper or scrap. Scrap copper accounts for 35-40% (Table 11) of the raw material input of global refined copper production.

Copper wire is the single most important source of copper scrap. For recovery purposes, scrap copper is segregated into four principal categories: No. 1 copper wire, No. 2 copper wire, No. 3 copper, and copper-bearing scrap. The differentiation between No. 1 and No. 2 copper wire relates to the minimum copper content of the wire. Other major sources of scrap copper include copper tubing, electrical motors and copper sheeting. Copper scrap also arises in the form of residues and can be recovered from metallurgical compounds, metallic dusts, electronic scrap, copper-containing ashes, and copper-containing sludges. Bronze alloys contain varying percentages of copper and tin as their principal elements. They may also contain smaller proportions of both lead and zinc. Brass alloys contain copper and zinc as their principal elements and may also contain smaller proportions of both tin and lead. Brass and bronze scrap arises in forms such as water valves, plumbing fixtures, auto radiators, cast machinery, train brake linings, ship propellers, brass pipes, water condenser tubes, and lighting fixtures.

The recovery of copper from recycled sources can have significant energy savings when compared to the production of primary copper.

REQUIREMENTS TO PRODUCE COPPER FROM VARIOUS SOURCES (PRIMARY = 100)

Copper Source	Energy Requirements
	(%)
No. 1 scrap copper	3
No. 2 scrap copper	14
Copper-bearing scrap	35
Brass and bronze scrap	6

Source: Kusik & Kenahan, *Energy Use Patterns for Metal Recycling*.

STOCKS

Combined copper stocks on the London Metal Exchange (LME), the Commodities Exchange, Inc. (COMEX) and the Shanghai Metal Exchange increased substantially during the year. At the end of December 2001, stocks at the above-mentioned metal exchanges stood at a record high 1 137 000 t, compared to 523 700 t at the end of 2000.

Total copper stocks, including those at producers, merchants, users and exchanges, amounted to 1 785 000 t at the end of 2001, compared to 1 230 800 t at the end of 2000. Figure 2 shows both total copper stocks and prices for the period 1991-2001.

PRICES

Copper prices on the LME averaged US$1578/t (71.6¢/lb) in 2001 (Figure 2) compared to US$1813/t (82.3¢/lb) in 2000.

OUTLOOK

According to the ICSG, world production of refined copper is expected to decline by about 1.8% to 15.16 Mt in 2002 (net of adjustments for primary feed shortages). World refined copper use is expected to increase by 3% in 2002 to 15.18 Mt. Based on these figures, the ICSG, at its 10th General Session in March 2002, projected a small market deficit of 20 000 t for 2002.

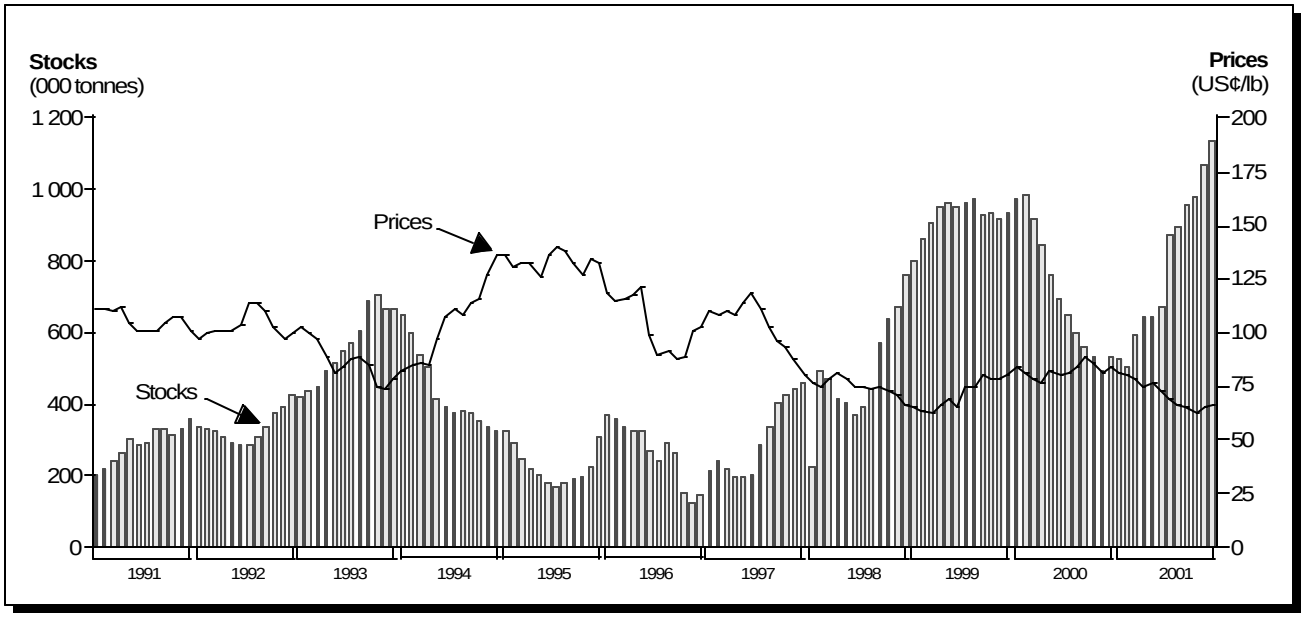
Although demand is expected to recover in 2002, the unprecedented level of copper stocks will prevent any significant price recovery until late in 2002 or early 2003. For the full year 2002, prices are forecast to average in the US71¢-72¢/lb range, or US$1565-$1587/t.

The ICSG's preliminary estimate of supply and demand for 2003 forecasts demand growth of 5% compared to supply growth of 3.3% and a correspon-ding metal deficit of 300 000 t. Based on this and other analysts' forecasts, demand growth should outstrip supply growth over the period 2003-05. This could push prices up to the US$0.95-$1.00/lb level (US$2094-$2205/t) during the period 2003-05.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 64. (2) Information in this review was current as of April 30, 2002. (3) This and other reviews, including previous editions, are available on the Internet at www.nrcan.gc.ca/mms/cmy/index_e.html.

NOTE TO READERS

Figure 2
Copper Prices[1] and Exchange[2] Stocks, 1991-2001



Source: Natural Resources Canada.

[1] Average monthly LME cash prices. [2] Combined exchange stocks at end of the month.

TARIFFS

Item No.	Description	Canada MFN	Canada GPT	Canada USA	United States Canada	EU MFN	Japan (1) WTO
2603.00	Copper ores and concentrates						
2603.00.00.10	Copper content	Free	Free	Free	Free	Free	Free
2825.50	Copper oxides and hydroxides	Free	Free	Free	Free	3.2%	4.8%
28.33	Sulphates; alums; peroxosulphates (persulphates)						
	Other sulphates:						
2833.25	Of copper						
2833.25.10	Cupric sulphate	Free	Free	Free	Free	3.2%	3.9%
2833.25.90	Other copper sulphates	5.5%	Free	Free	Free	3.2%	3.9%
74.01	Copper mattes; cement copper (precipitated copper)						
7401.10	Copper mattes	Free	Free	Free	Free	Free	Free
7401.20	Cement copper (precipitated copper)	Free	Free	Free	Free	Free	Free
7402.00	Unrefined copper; copper anodes for electrolytic refining	Free	Free	Free	Free	Free	Free-3%
74.03	Refined copper and copper alloys,						
	Refined copper:						
7403.11	Cathodes and sections of cathodes	Free	Free	Free	Free	Free	Free-3%
7403.12	Wire bars	Free	Free	Free	Free	Free	Free-3%
7403.13	Billets	Free	Free	Free	Free	Free	Free-3%
7403.19	Other	Free	Free	Free	Free	Free	Free-3%
	Copper alloys:						
7403.21	Copper-zinc base alloys (brass)	Free	Free	Free	Free	Free	Free
7403.22	Copper-tin base alloys (bronze)	Free	Free	Free	Free	Free	Free-3%
7403.23	Copper-nickel base alloys (cupro-nickel) or copper-nickel-zinc base alloys (nickel-silver)	Free	Free	Free	Free	Free	Free-3%
7403.29	Other copper alloys (other than master alloys of heading no. 74.05)	Free	Free	Free	Free	Free	Free-3%
7404.00	Copper waste and scrap	Free	Free	Free	Free	Free	Free
7405.00	Master alloys of copper	Free	Free	Free	Free	Free	3%
74.06	Copper powders and flakes	Free	Free	Free	Free	Free	3%
74.07	Copper bars, rods and profiles of refined copper	Free-3%	Free	Free	Free	4.8%	3%
74.08	Copper wire of refined copper	Free-3%	Free	Free	Free	4.8%	3%
74.09	Copper plates, sheets and strip of a thickness exceeding 0.15 mm	Free	Free	Free	Free	4.8%	3%
74.10	Copper foil (whether or not printed or backed with paper, paperboard, plastics or similar backing materials) of a thickness (excluding any backing) not exceeding 0.15 mm	Free	Free	Free	Free	5.2%	3%
74.11	Copper tubes and pipes	2-2.5%	Free	Free	Free	4.8%	3%
74.12	Copper tube or pipe fittings (for example, couplings, elbows, sleeves)	3%	Free	Free	Free	5.2%	Free
7413.00	Stranded wire, cables, plaited bands and the like, of copper, not electrically insulated	3%	Free	Free	Free	Free-5.2%	3%
74.14	Cloth (including endless bands), grill and netting, of copper wire; expanded metal of copper	3%	Free	Free	Free	4.3%	Free
74.15	Nails, tacks, drawing pins, staples (other than those of heading no. 83.05) and similar articles, of copper or of iron or steel with heads of copper; screws, bolts, nuts, screw hooks, rivets, cotters, cotter-pins, washers (including spring washers) and similar articles, of copper	Free-3%	Free	Free	Free	3-4%	Free
7416.00	Copper springs	3%	Free	Free	Free	4%	Free
7417.00	Cooking or heating apparatus of a kind used for domestic purposes, non-electric and parts thereof, of copper	3%	Free	Free	Free	4%	Free
74.18	Table, kitchen or other household articles and parts thereof, of copper; pot scourers and scouring or polishing pads, gloves and the like, of copper; sanitary ware and parts thereof, of copper	3%	Free	Free	Free	3%	Free
74.19	Other articles of copper	Free-9.5%	Free-5%	Free	Free	3%	Free

Sources: *Customs Tariff,* effective January 2002, Canada Customs and Revenue Agency; *Harmonized Tariff Schedule of the United States*, 2002; *Worldtariff Guidebook on Customs Tariff Schedules of Import Duties for European Union* (41st Annual Edition: 2001); *Custom Tariff Schedules of Import Duties for Japan* (35th Annual Edition: 2001).

(1) WTO rate is shown; lower tariff rates may apply circumstantially.

TABLE 1. CANADA, COPPER PRODUCTION AND TRADE, 2000 AND 2001

Item No.		2000		2001 (p)	
		(tonnes)	($000)	(tonnes)	($000)
SHIPMENTS (1)					
	Newfoundland and Labrador	–	–	–	–
	Prince Edward Island	–	–	–	–
	Nova Scotia	–	–	–	–
	New Brunswick	9 423	25 516	8 939	22 240
	Quebec	93 215	252 426	98 220	244 371
	Ontario	199 948	541 459	181 065	450 490
	Manitoba	47 974	129 912	49 312	122 689
	Saskatchewan	642	1 739	748	1 862
	Alberta	–	–	–	–
	British Columbia	270 688	733 024	272 875	678 914
	Yukon	–	–	–	–
	Northwest Territories	–	–	–	–
	Total	621 889	1 684 075	611 160	1 520 566
	Refinery output	551 393	..	564 631	..
EXPORTS					
2603.00.10	Copper ores and concentrates				
	Copper content				
	Japan	396 578	328 900	382 576	279 052
	China	147 342	113 334	99 178	78 824
	South Korea	54 815	42 738	64 154	49 887
	India	22 176	15 793	21 433	16 754
	Other countries	58 632	46 240	50 662	43 900
	Total	679 543	547 005	618 003	468 417
2604.00.00.10, 2607.00.00.10, 2608.00.00.10, 2616.10.00.10	Other ores and concentrates				
	Copper content				
	Finland	–	–	4 050	2 673
	Total	–	–	4 050	2 673
2620.30	Copper ash and residues				
	United States	...	49	43	89
	United Kingdom	3 887	2 462	–	–
	Total	3 887	2 511	43	89
2825.50	Copper oxides and hydroxides	–	–	...	1
2833.25	Copper sulphates				
	United States	5 902	7 328	5 601	7 241
	Cuba	–	–	...	...
	Total	5 902	7 328	5 601	7 241
7401.10	Copper mattes				
	Norway	13 432	31 430	14 940	32 515
	Netherlands	–	–	1 091	2 140
	Other countries	41	15	21	48
	Total	13 473	31 445	16 052	34 703
7401.20	Copper mattes; cement copper (precipitated copper)				
	United States	...	17	–	–
	Total	...	17	–	–
7402.00	Copper anodes				
	United States	53 807	234 008	80 108	364 768
	Total	53 807	234 008	80 108	364 768

TABLE 1 (cont'd)

Item No.		2000		2001 (p)	
		(tonnes)	($000)	(tonnes)	($000)
EXPORTS (cont'd)					
7403.11 to 7403.19	Refined copper and copper alloys, unwrought				
	United States	267 774	762 729	270 328	706 128
	United Kingdom	13 164	40 602	23 812	64 445
	Netherlands	–	–	8 599	22 179
	Colombia	1 307	5 908	3 747	17 732
	France	3 441	9 400	1 597	4 271
	Dominican Republic	316	1 444	316	1 505
	Cuba	–	–	198	921
	Other countries	2 333	6 567	300	1 395
	Total	288 335	826 650	308 897	818 576
7403.21 to 7403.29	Copper alloys and other copper alloys				
	United States	3 137	8 884	2 737	8 827
	Hong Kong	–	–	6	55
	Other countries	10	46	2	4
	Total	3 147	8 930	2 745	8 886
7404.00	Copper waste and scrap				
	United States	63 475	127 668	56 447	110 866
	China	6 098	8 588	8 539	12 978
	Germany	96	147	1 672	2 997
	India	821	1 074	1 423	2 277
	South Korea	1 206	1 713	594	825
	Netherlands	–	–	433	736
	Japan	311	817	399	713
	Other countries	1 053	1 756	738	1 496
	Total	73 060	141 763	70 245	132 888
7405.00	Master alloys of copper				
	United States	2	7	–	–
	Total	2	7	–	–
7406.10 to 7406.20	Copper powders and flakes				
	Taiwan	29	264	24	259
	United States	46	283	33	237
	Other countries	20	298	19	154
	Total	95	845	76	650
7407.10 to 7407.29	Copper bars, rods and profiles of refined copper				
	United States	9 956	43 687	6 630	29 348
	Chile	252	1 131	161	725
	Other countries	20	96	46	244
	Total	10 228	44 914	6 837	30 317
7408.11 to 7408.29	Copper wire of refined copper and of copper alloys				
	United States	116 427	359 083	112 831	323 017
	Argentina	3	61	4	62
	Other countries	46	514	14	132
	Total	116 476	359 658	112 849	323 211
7409.11 to 7410.22	Copper plates, sheets, strip and foil of refined copper and of copper alloys				
	United States	17 369	133 389	11 278	56 534
	Thailand	787	3 236	964	3 519
	Saudi Arabia	544	2 502	534	2 397
	India	431	1 802	462	1 845
	Jordan	471	2 028	426	1 742
	United Kingdom	681	2 474	444	1 581
	Other countries	2 345	10 202	1 593	6 930
	Total	22 628	155 633	15 701	74 548

TABLE 1 (cont'd)

Item No.		2000		2001 (p)	
		(tonnes)	($000)	(tonnes)	($000)
EXPORTS (cont'd)					
7411.10 to 7411.29	Copper tubes and pipes of refined copper and of copper alloys				
	United States	21 300	116 250	18 203	110 002
	Netherlands	50	333	529	3 307
	United Kingdom	267	2 008	130	984
	Australia	48	353	74	728
	Brazil	–	–	79	656
	Other countries	344	1 963	236	1 508
	Total	22 009	120 907	19 251	117 185
7412.10 to 7412.20	Copper tube and pipe fittings of refined copper and of copper alloys				
	United States	..	27 491	..	37 714
	Spain	..	3 647	..	3 403
	United Kingdom	..	2 501	..	1 633
	Germany	..	2 337	..	1 612
	Other countries	..	4 405	..	3 941
	Total	..	40 381	..	48 303
7413.00	Stranded wire, cables, plaited bands and the like, of copper, not electrically insulated				
	United States	1 049	4 809	1 013	6 012
	Other countries	41	292	20	44
	Total	1 090	5 101	1 033	6 056
7414, 7415, 7416, 7419	Other items of copper				
	United States	..	38 648	..	40 292
	Brazil	..	–	..	229
	Other countries	..	509	..	698
	Total	..	39 157	..	41 219
	Total exports		2 566 260		2 479 731
IMPORTS (2)					
2603.00.00.10	Copper ores and concentrates				
	Copper content				
	Chile	103 304	202 662	106 849	206 436
	United States	45 585	98 844	29 468	65 525
	Argentina	17 134	35 465	17 258	36 451
	Peru	–	–	19 516	31 061
	Portugal	12 656	16 924	14 573	23 371
	Indonesia	12 485	25 523	10 109	21 089
	Other countries	20 135	36 938	21 760	44 651
	Total	211 299	416 356	219 533	428 584
2604.00.00.10, 2607.00.00.10, 2608.00.00.10, 2616.10.00.10	Other ores and concentrates				
	Copper content				
	United States	485	792	285	502
	Mexico	130	197	129	246
	Total	615	989	414	748
2620.30	Copper ash and residues				
	United States	13 190	14 097	6 880	9 958
	Sweden	585	1 283	923	1 753
	Germany	19	7	805	455
	Spain	–	–	1 213	339
	Other countries	548	3 559	88	85
	Total	14 342	18 946	9 909	12 590
2825.50	Copper oxides and hydroxides	1 648	4 130	1 390	3 894
2833.25	Copper sulphates	15 379	13 642	19 145	15 888

TABLE 1 (cont'd)

Item No.		2000		2001 (p)	
		(tonnes)	($000)	(tonnes)	($000)
IMPORTS (cont'd)					
2836.99.90.10	Copper carbonates	..	1	..	4
2836.99.90.10	Other copper carbonates	4	10	6	13
	Other cyanides:				
2837.19.00.10	Copper cyanides	49	294	47	298
3212.90.90.12	Pigments based on copper or copper alloy powders and flakes	5	87	19	222
7401.10	Copper mattes	489	2 292	2	6
7401.20	Copper mattes; cement copper (precipitated copper)	1 550	5 845	145	295
7402.00	Copper anodes	11 484	23 909	21 066	41 488
7403.11 to 7403.19	Refined copper and copper alloys, unwrought				
	Refined copper	11 874	34 942	7 993	22 863
7403.21 to 7403.29	Refined copper and copper alloys, unwrought				
	Copper alloy and other copper alloys	11 989	38 088	8 491	29 687
7404.00	Copper waste and scrap				
	United States	85 620	156 076	72 431	128 785
	Chile	1 501	3 301	11 504	29 863
	Sweden	–	–	12 489	14 992
	Germany	223	106	2 976	9 503
	Cuba	1 207	1 970	781	1 346
	United Kingdom	318	602	169	564
	Other countries	3 395	9 001	261	505
	Total	92 264	171 056	100 611	185 558
7405.00	Master alloys of copper	294	1 255	310	1 328
7406.10 to 7406.20	Copper powders and flakes	2 304	12 369	2 042	10 451
7407.10 to	Copper bars, rods and profiles of refined copper				
7407.29	United States	37 092	128 976	30 263	100 616
	Poland	3 024	6 389	2 946	6 155
	South Korea	5 438	7 476	2 023	3 699
	United Kingdom	2 387	7 913	368	2 181
	Germany	294	1 288	284	1 417
	Other countries	4 923	12 537	1 926	5 595
	Total	53 158	164 579	37 810	119 663
7408.11 to 7408.29	Copper wire of refined copper and of copper alloys	29 052	97 393	24 761	82 343
7409.11 to 7409.90, 7410.11 to 7410.22	Copper and copper alloy plates, sheets, strip and foil	49 468	303 501	37 230	211 673
7411.10	Pipes and tubes, refined copper	10 593	48 551	8 135	38 507
7411.21	Pipes and tubes, copper-zinc base alloys	4 325	23 892	4 658	22 887
7411.22	Pipes and tubes, copper-nickel base alloys or copper-nickel-zinc base alloys	392	2 508	413	2 719
7411.29	Plates and tubes, copper alloys, n.e.s.	1 718	10 398	2 339	14 332
7412.10	Fittings, pipe or tube, of refined copper	922	11 300	952	12 293
7412.20	Fittings, pipe or tube, copper alloys	5 575	70 782	5 618	71 862
7413.00	Stranded wire, cable, plaited bands and the like, of copper, not electrically insulated	5 871	24 706	8 359	34 108

TABLE 1 (cont'd)

Item No.		2000		2001 (p)	
		(tonnes)	($000)	(tonnes)	($000)
IMPORTS (cont'd)					
7414.20	Endless bands of copper wire for machinery	..	245	..	357
7415.10	Nails, tacks, drawing pins, staples and similar articles of copper or of iron or steel with copper heads	244	1 405	154	913
7415.21	Copper washers, including spring washers	272	1 842	275	1 684
7415.29	Articles of copper, not threaded, n.e.s., similar to those of headings 7415.10 and 7415.21	950	4 567	942	4 986
7415.31	Copper screws, for wood	39	237	19	115
7415.32	Screws, bolts and nuts of copper, excluding wood screws	1 212	6 279	1 223	6 196
7415.39	Articles of copper, threaded, n.e.s., similar to bolts, nuts and screws	842	4 531	703	3 717
7416.00	Copper springs	..	558	..	482
7419.10	Chain and parts thereof of copper	62	462	62	391
7419.91	Articles of copper, not further worked than cast, moulded, stamped or forged	10 788	1 366 745	3 296	26 655
7419.99	Articles of copper, n.e.s.	..	55 541	..	49 133
	Total imports		2 945 855		1 459 849

Sources: Natural Resources Canada; Statistics Canada.
– Nil; **..** Not available or not applicable; **...** Amount too small to be expressed; n.e.s. Not elsewhere specified; (p) Preliminary.
(1) Anode copper recovered in Canada from domestic concentrates plus exports of payable copper in concentrate and matte. (2) Imports from "other countries" may include re-imports from Canada.
Note: Numbers may not add to totals due to rounding.

TABLE 2. CANADA, COPPER PRODUCTION, TRADE[1] AND USE, 1975, 1980 AND 1985-2001

	Production		Exports			Imports	Use (3)
	Shipments (2)	Refinery Output	Concentrates and Matte	Refined	Total	Refined	Refined
			(tonnes)				
1975	733 826	529 197	314 518	320 705	635 223	10 908	196 106
1980	716 363	505 238	286 076	335 022	621 098	13 466	208 590
1985	738 637	499 626	320 619	280 033	600 652	19 131	222 466
1986	698 527	493 445	341 390	306 822	648 212	20 901	225 586
1987	794 149	491 124	381 126	288 800	669 926	16 583	231 288
1988	758 478	528 723	348 404	268 680	617 084	4 659	236 280
1989	704 432	515 216	348 739	321 690	670 429	4 408	213 046
1990	771 433	515 835	374 875	335 941	710 816	2 611	180 605
1991	780 362	538 339	348 080	377 985	726 065	2 321	159 170
1992	761 694	539 302	346 842	385 761	732 603	8 916	156 132
1993	709 650	561 580	319 840	408 364	728 204	21 155	185 565
1994	590 784	549 869	237 554	388 568	626 122	(r) 19 594	(r) 199 350
1995	700 843	572 616	(r) 274 493	(r) 434 693	(r) 709 186	(r) 24 176	(r) 189 550
1996	652 499	559 200	409 577	384 338	793 915	28 700	218 280
1997	647 779	560 582	515 547	381 476	897 023	22 602	224 777
1998	690 762	562 261	450 867	355 825	806 692	18 685	246 212
1999	581 583	548 563	(r) 355 838	294 106	(r) 649 944	(r) 16 475	(r) 266 505
2000	621 889	551 393	693 016	288 335	981 351	11 874	272 075
2001 (p)	611 160	564 631	638 105	308 897	947 002	7 993	271 455

Sources: Natural Resources Canada; Statistics Canada.
(p) Preliminary; (r) Revised.
(1) Beginning in 1988, exports and imports are based on the new Harmonized System and may not be in complete accordance with previous method of reporting. (2) From 1975 to 1988, anode copper recovered in Canada from domestic concentrate plus exports of payable copper in concentrates and matte. Starting in 1989 to date, recoverable copper in concentrate shipped.
(3) Producers' domestic shipments of refined copper plus imports of refined shapes.

TABLE 3. WORLD MINE PRODUCTION OF COPPER, 1999-2001

	1999	2000	2001 (p)
		(000 t)	
Chile	4 391	4 602	4 739
United States	1 626	1 467	1 355
Indonesia	786	1 005	1 046
Australia	719	829	873
Peru	536	554	722
Canada	620	634	633
China	520	589	565
Russia	510	525	545
Poland	463	454	475
Kazakhstan	374	430	470
Mexico	381	365	367
Zambia	280	249	312
Papua New Guinea	188	203	204
South Africa	161	148	120
Other	1 628	1 524	1 152
Total	12 742	13 183	13 578

Source: International Copper Study Group.
(p) Preliminary.

TABLE 4. WORLD REFINERY PRODUCTION OF COPPER, 1999-2001

	1999	2000	2001 (p)
		(000 t)	
Chile	2 666	2 668	2 882
United States	2 132	1 794	1 800
China	1 174	1 371	1 427
Japan	1 342	1 437	1 426
Russia	750	816	852
Germany	696	709	694
Canada	549	551	565
Australia	419	487	560
Poland	470	486	498
South Korea	450	468	473
Peru	434	452	462
Belgium/Luxembourg	388	423	424
Kazakhstan	362	395	422
Mexico	427	411	414
Scandinavia	263	273	358
Zambia	268	227	296
Spain	305	314	291
Brazil	193	184	211
Philippines	148	150	162
Other	1 069	1 169	1 222
Total	14 505	14 785	15 439

Source: International Copper Study Group.
(p) Preliminary.

TABLE 5. WORLD REFINED COPPER USE, 1999-2001

	1999	2000	2001 (p)
		(000 t)	
United States	2 995	3 019	2 630
China	1 506	1 879	2 235
Japan	1 293	1 348	1 146
Germany	1 138	1 310	1 141
South Korea	789	861	836
Italy	668	664	674
Taipei, China	655	628	536
Mexico	455	476	411
Brazil	285	333	353
Belgium-Luxembourg	353	347	323
Scandinavia	292	302	309
Spain	255	284	298
India	264	265	290
United Kingdom	300	323	285
Canada	267	274	265
Poland	251	247	264
Russia	158	180	250
Australia	165	168	167
Other	2 163	2 372	2 887
Total	14 252	15 280	15 300

Source: International Copper Study Group.
(p) Preliminary.

TABLE 6. COPPER AND COPPER-NICKEL SMELTERS IN CANADA, 2001

Company and Location	Product	Rated Annual Capacity (1)	Feed Material	Remarks
		(000 tonnes)		
Falconbridge Limited Falconbridge, Ontario	Copper-nickel matte	23	Nickel-copper concentrates	Copper-nickel concentrate processed in fluid bed roasters and an electric furnace; 1800-t/d sulphuric acid plant treats roaster gases. Matte from the smelter is refined in Norway.
Inco Limited Sudbury, Ontario	Molten "blister" copper, nickel sulphide and nickel sinter for the company's refineries; nickel oxide sinter for market, soluble nickel oxide for market	135	Bulk nickel-copper concentrates, scrap	Oxygen flash-smelting of copper sulphide concentrate. Copper converters produce blister copper. Oxygen flash furnace for smelting of nickel-copper concentrate; converters for production of nickel-copper Bessemer matte. Production of matte followed by matte treatment, flotation, separation of copper and nickel sulphides, then by roasting to make nickel oxides for refining and marketing. Oxygen flash conversion of copper sulphide to semi-blister followed by pyrorefining to blister copper.
Falconbridge Limited Timmins, Ontario	Molten "blister" copper	140	Copper concentrates, scrap	Mitsubishi-type smelting, separation and converting furnaces. Hazelett continuous cast anodes. Incremental expansion increased capacity to 140 000 t/y in 1999.
Noranda Inc. Horne smelter Rouyn-Noranda, Quebec	Copper anodes	200	Copper concentrates, scrap	New continuous converter commissioned in 1997.
Noranda Inc. Gaspé smelter Murdochville, Quebec	Copper anodes	135	Copper concentrates	Green charge reverberatory furnace, three converters, one rotary anode furnace and an acid plant.
Hudson Bay Mining and Smelting Co., Limited (HBMS) Flin Flon, Manitoba	Copper anodes	90	Copper concentrates	Five roasting furnaces, one reverberatory furnace and two converters. Modernization planned but delayed indefinitely.

Source: Data were provided by the companies listed.
(1) Copper in matte, blister and anode.

TABLE 7. COPPER REFINERIES IN CANADA, 2001

Company and Location	Rated Annual Capacity	Remarks
	(tonnes)	
CCR Refinery Noranda Inc. Montréal-Est, Quebec	360 000	Refines anodes from Noranda's Horne and Gaspé smelters, and also from purchased scrap and anode scrap. Precious metals, selenium and tellurium are recovered from slimes. Modernization program completed in July 1999 will raise capacity to 360 000 t/y by 2001.
Inco Limited Copper Cliff, Ontario	140 000	Casts and refines anodes from molten converter copper from the Copper Cliff smelter, and also refines purchased scrap. Gold, silver, selenium and tellurium cake are recovered from anode slimes. Recovers and electrowins copper from Copper Cliff nickel refinery residue. Annual capacity is a function of copper content in concentrates produced.
Inco Limited Copper Cliff, Ontario	9 000	Electrowinning plant processes copper-bearing fluids.
Falconbridge Limited Timmins, Ontario	147 000	Refines anodes from the Kidd Creek smelter. Incremental expansion increased capacity to 147 000 t/y in 2000.
Boliden Limited McLeese Lake, British Columbia	2 000	Dissolved copper-in-solution from heap leaching operations is treated in a solvent extraction plant and then electrowinned to produce copper cathode. Production suspended in December 1998. Operation sold to Taseko Mines Limited in April 1999.

Source: Data were provided by the companies listed.

TABLE 8. U.S. SUPPLY OF WIRE MILL, BRASS MILL, FOUNDRY AND POWDER PRODUCTS, AND THEIR USES, 1999 AND 2000

United States	1999	2000 (p)
		(000 t)
SUPPLY		
Domestic mill products		
Building wire	645	650
Magnet wire	353	363
Telecommunications cable	295	306
Power cable	142	145
Automotive wire and cable	172	179
Electronic wire and cable	118	136
Other wire and cable	301	311
Strip, sheet, plate and foil	610	646
Rod and bar	562	566
Tube and pipe	583	567
Mechanical wire	43	45
Foundry products	174	175
Powder products	20	21
Total, domestic mill products	4 017	4 110
Imported mill products	142	222
Total supply	4 159	4 332
USES		
Building construction	1 690	1 696
Electrical/electronic products	1 093	1 196
Industrial machinery/equipment	449	458
Transportation equipment	492	497
Consumer and general products	435	485
Total	4 159	4 332

Source: Copper Development Association Inc.
(p) Preliminary.
Note: Numbers may not add to totals due to rounding.

TABLE 9. YEARLY AVERAGE COPPER PRICES,[1] 1981-2001

Year	LME
	(current US¢/lb)
1981	79.0
1982	67.1
1983	72.1
1984	62.5
1985	64.3
1986	62.3
1987	80.9
1988	117.9
1989	128.9
1990	121.0
1991	106.2
1992	103.7
1993	86.8
1994	104.7
1995	132.9
1996	104.1
1997	103.2
1998	75.0
1999	71.3
2000	84.4
2001	71.8

Source: International Copper Study Group.
(1) Grade A, Cash.

TABLE 10. MONTHLY AVERAGE COPPER PRICES, 2000 AND 2001

	LME (1)		COMEX (2)	
	2000	2001	2000	2001
	(current US¢/lb)			
January	83.6	81.10	84.8	83.70
February	81.7	80.09	82.4	82.01
March	78.9	78.87	79.6	80.07
April	76.2	75.49	77.4	76.30
May	82.8	76.30	82.8	76.84
June	79.5	72.96	80.7	72.58
July	81.6	69.18	83.9	69.44
August	84.2	66.43	86.7	67.34
September	88.9	64.70	91.5	65.41
October	86.1	62.47	87.6	63.20
November	81.4	64.76	83.2	66.09
December	83.9	66.76	86.9	67.83

Source: International Copper Study Group.
(1) LME cash price for Grade A copper. (2) COMEX First Position High Grade price.

TABLE 11. WORLD COPPER SCRAP RECOVERY AS A PERCENTAGE TOTAL REFINED PRODUCTION, 1998-2000

	1998		1999		2000	
	(000 t)	(%)	(000 t)	(%)	(000 t)	(%)
Europe	2 088	14.8	2 186	15.1	2 134	14.4
Asia	1 415	10.0	1 327	9.2	1 270	8.6
Africa	37	0.3	33	0.2	37	0.3
America	1 826	12.9	1 673	11.6	1 638	11.0
Oceania	45	0.3	60	0.4	–	–
Total (1)	5 411	37.2	5 279	36.5	5 079	34.4

Source: World Bureau of Metal Statistics.
– Nil.
(1) Final percentage calculation includes refined copper from other countries.