

# Copper

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**1996 production:** \$2.1 billion  
**World rank:** Third  
**Exports (concentrate and unwrought):** \$1.85 billion

Canada	1996	1997 <sup>e</sup>	1998 <sup>f</sup>
(000 tonnes)			
Copper mine production	689	666	697
Refined copper production	559	554	591
Refined consumption	218	227	235
Concentrate exports	386	348	380
Concentrate imports	135	150	160
Unwrought copper exports	384	355	384
Unwrought copper imports	29	28	28

<sup>e</sup> Estimated; <sup>f</sup> Forecast.

**C**opper'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 consumed annually is used for electrical applications, mostly as wire.

## ANNUAL AVERAGE SETTLEMENT PRICES, LONDON METAL EXCHANGE

1993	1994	1995	1996	1997 <sup>e</sup>
(US\$/t)				
1 913	2 307	2 930	2 294	2 315

<sup>e</sup> Estimated.

## CANADIAN OVERVIEW

- While Canadian copper mine production in 1997 had been expected to post a modest increase over 1996, lower-than-expected output levels at a number of mining operations resulted in a slight overall decrease. During 1997, the Afton mine of Teck Corporation in British Columbia and the Copper Rand and Portage mines of MSV Resources Inc. in Quebec closed due to the depletion of ore reserves. The Copper Rand mine could re-open in 1999 if the company proceeds with a development program.
- During 1997, Princeton Mining Corporation began production at its 60%-owned Huckleberry mine in British Columbia. The mine is expected to produce an annual average of 29 500 t of contained copper, 186 kg of gold, 8400 kg of silver and 450 t of molybdenum. Also in B.C., Imperial Metals Corporation began operations at its 55%-owned Mount Polley mine, which is expected to produce about 3100 kg/y of gold during the first four years of operation and an average of 12 700 t/y of copper in concentrate during the entire mine life of at least 12 years.

## WORLD OVERVIEW

- In 1997, world mine production of copper is forecast to increase to over 11.2 Mt from about 10.1 Mt in 1995 and 11.0 Mt in 1996. In 1996, world production of refined copper was 12.7 Mt, while world refined copper consumption was 12.6 Mt. In 1997, world refined production is forecast to be more than 13.5 Mt, while consumption of refined copper in 1997 is expected to be about 13.1 Mt.
- Chilean copper mine production is expected to increase to about 3.7 Mt/y by 1997 and to as much as 4.7 Mt/y by the year 2000. Chilean mine output of copper in 1995 was about 2.5 Mt. The Chilean Copper Commission (Cochilco) expects that copper-related foreign investment in Chile will total US\$1.5 billion in 1997 compared to \$886 million in 1996. Cochilco expects that copper-related investment for the period 1998-2000 will total US\$4.8 billion.

- In October 1997, copper prices fell to below US\$2000/t (90¢/lb) due to increases in world copper inventories and uncertainties with regard to future Asian demand.
- At the time of writing, it was expected that smelting and refining charges for 1998 long-term contracts would be slightly lower than 1997 levels (US\$105/dry metric tonne (dmt) and 10.5¢/lb).

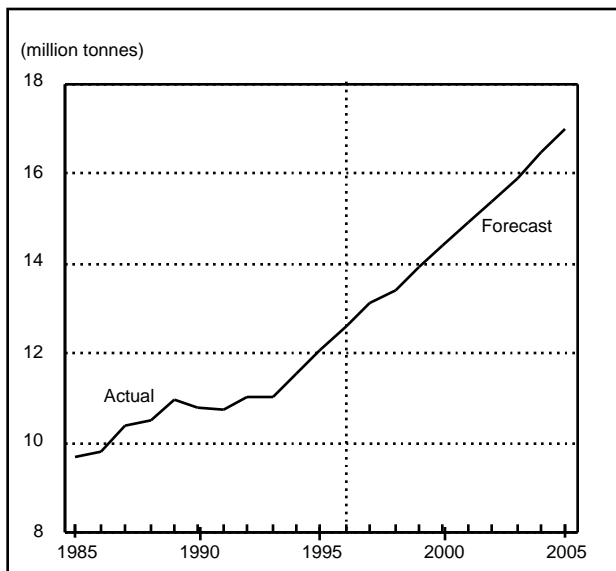
## CONSUMPTION OUTLOOK

World consumption of refined copper in 1998 is forecast to increase to 13.5 Mt. For the period 1998-2005, copper consumption is expected to grow at an annual average rate of about 3.5%. The largest increases in copper consumption will occur in the construction, transportation, and electrical and electronics industries. The United States and China are expected to account for a large part of this growth.

A number of promising new markets for copper could provide significant growth opportunities. These include certain roofing uses, fire suppression systems, natural gas systems, solar power generation, data communications, and the storage of spent nuclear fuel.

While aluminum has largely replaced copper in original-equipment automotive radiators, new fabrication techniques such as no-flux brazing could allow copper to regain a significant share of this important market. In addition, the expected increase in the number of electrical circuits in automobiles could provide a significant boost for copper demand.

**Figure 1**  
World Copper Consumption, 1985-2005

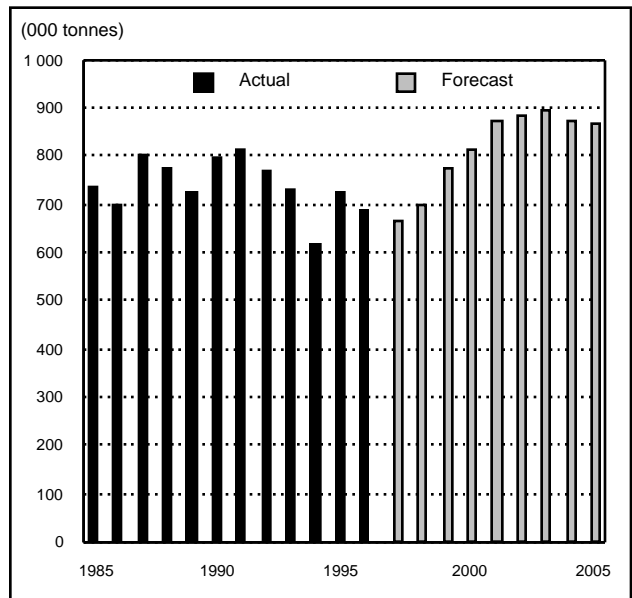


Source: Natural Resources Canada.

## CANADIAN PRODUCTION OUTLOOK

With the start-up of several new mines in the 1997-99 period, Canadian mine production of copper in 2000 is expected to exceed 800 000 t. The additions to capacity include the Minto development in the Yukon; the Huckleberry, Kemess South, and Mount Polley projects in British Columbia; and the Raglan mine development in Quebec. In the longer term, a number of other Canadian projects offer significant potential for additional production capacity. These include the Casino, Fyre Lake, Kudze Kayah and Wolverine prospects in the Yukon; Red Chris, Prosperity and Tulsequah Chief in British Columbia; and the Voisey's Bay property in Labrador. It is expected that Canadian mine production of copper during the first half of the next decade will range between 850 000 and 900 000 t/y.

**Figure 2**  
Canadian Mine Production of Copper, 1985-2005



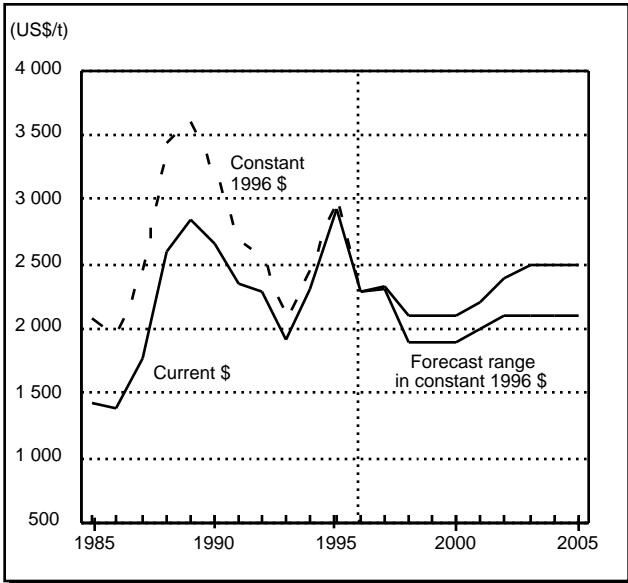
Source: Natural Resources Canada.

## PRICE OUTLOOK

While copper consumption is forecast to remain strong in 1998 and 1999, it is expected that further increases in world copper mine production capacity, particularly in South America, will continue to exert downward pressure on prices. Copper prices are expected to remain at lower levels until early in the next decade when the growth in production capacity is forecast to slow.

Copper is expected to trade in a range of between US\$1900 and \$2100/t (US86¢ and 95¢/lb) for the period 1998-2000. In the longer term, copper prices are expected to trade in a range between US\$2100 and \$2500/t (US\$0.95/lb and \$1.13/lb) in constant 1996 dollars.

**Figure 3**  
**Copper Prices, 1985-2005**  
Annual LME Settlement



Source: Natural Resources Canada.