

# Copper

## Bill McCutcheon

International and Domestic Market Policy Division

Telephone: (613) 992-5480

E-mail: [bmccutch@nrcan.gc.ca](mailto:bmccutch@nrcan.gc.ca)

|  |                |
|--|----------------|
| 2001 production:                         | \$1.52 billion |
| World rank<br>(mine production):         | Sixth          |
| Exports (concentrates<br>and unwrought): | \$1.3 billion  |

| Canada             | 2001 (p) | 2002 (e) | 2003 (f) |
|--------------------|----------|----------|----------|
|                    |          |          |          |
|                    |          | (000 t)  |          |
| Mine production    | 632      | 605      | 587      |
| Refined production | 565      | 600      | 600      |
| Refined use        | 257      | 260      | 250      |

(e) Estimated; (f) Forecast; (p) preliminary.

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 in wire.

## ANNUAL AVERAGE SETTLEMENT PRICES, LONDON METAL EXCHANGE

| 1998 | 1999  | 2000     | 2001  | 2002 (e) |
|------|-------|----------|-------|----------|
|      |       | (US\$/t) |       |          |
| 1654 | 1 572 | 1 813    | 1 578 | 1 555    |

(e) Estimated.

## CANADIAN OVERVIEW

Canadian copper mines do not mine just copper. Rather, copper can be the principal metal mined; other by-product metals produced at Highland Valley Copper are molybdenum, gold and silver (1860 t, 65 t and 500 kg, respectively, in 2001). Other mines produce copper as a by-product of zinc, gold or nickel production (the Bouchard-Hébert, Troilus or Thompson mine, respectively). In other mines, copper is an important co-product (Falconbridge's Kidd operation).

- Newfoundland and Labrador:** Voisey's Bay Nickel Company and the Province of Newfoundland and Labrador reached an agreement to proceed with the development of the Voisey's Bay deposit. Shipments of copper production are expected to commence in 2006. Aur Resources acquired the Duck Pond deposit (5.2 Mt grading 3.3% Cu, 5.8% Zn, 0.9% Pb, 59 g/t Ag and 0.8 g/t Au of proven plus probable reserves); projected production is 14 500 t/y of copper in concentrate grading 24% Cu over 10 years.
- Quebec:** Noranda's Gaspé smelter was permanently closed on March 28 after having been put on standby in November 2001 while the company examined alternatives. At Noranda's Horne smelter, workers went on strike on June 18; since that time, Noranda has operated the smelter at reduced capacity. Noranda's CCR refinery is affected by the reduced feed. Breakwater Resources conducted underground exploration at its closed Langlois mine. Agnico-Eagle's mine expansion at La Ronde continued, with the mill reaching an operating rate of 6350 t/d (7000 st/d). Drilling has shown that gold and copper grades increase with depth. The Penna shaft extends to a depth of 2250 m and is believed to be the deepest in the Western Hemisphere.
- Ontario:** Falconbridge continued exploration of its Nickel Rim South deposit. Falconbridge expressed the desire to cooperate with Inco in seeking cost reductions in Sudbury, perhaps using Inco's Victor shaft for the Nickel Rim South deposit; Inco shelved the Victor project after getting agreement to proceed with Voisey's Bay. Falconbridge continued to develop Mine D at its Kidd Creek zinc-copper integrated operation. Noranda

increased its ownership of Falconbridge from 58.4% by spending \$64 million in the third quarter. Inco operated its Ontario division without a summer shut-down this year.

- **Manitoba/Saskatchewan:** HBMS proceeded with development of its \$200 million "777" mine located in Flin Flon. The 1530-m shaft is expected to be commissioned at the end of 2002. The mine is expected to start ore production in late 2003 and to reach full production of 2750 t/d in the third quarter of 2004. As announced earlier, HBMS closed its Ruttan mine in Leaf Rapids and 350 jobs were lost.
- **British Columbia:** BHP Billiton plc wants to sell its 33.6% share of Highland Valley Copper; after an Environmental Assessment, the mine received permission to divert groundwater into a nearby creek, thereby stabilizing pit walls and permitting the mine to stay open until 2009. Northgate will drill 34 000 m for a feasibility study of the Kemess North project, due in 2003. Boliden's Myra Falls operation, which closed in December 2001, re-opened in late March; costs have been cut by 20%. Taseko wants to build a hydrometallurgical refinery and re-open its Gibraltar mine; a \$110 million refinery producing 30 000 t/y of copper metal from copper concentrates has been studied. In November, Redcorp Ventures was awaiting a decision by the B.C. government for a Project Approval Certificate (PAC) for the Tulsequah Chief zinc-gold-silver-copper project with planned copper production of 10 400 t/y. The Court quashed the original PAC and remitted the question back to ministers for a decision.

## WORLD OVERVIEW

The International Copper Study Group's (ICSG) November forecast of production in Mt showed:

| Copper Forecast           | 2001 | 2002 | 2003 |
|---------------------------|------|------|------|
|                           | (Mt) |      |      |
| Cu in concentrate         | 11.0 | 10.8 | 11.4 |
| SXEW (1)                  | 2.6  | 2.7  | 2.7  |
| Primary refined           | 13.7 | 13.7 | 13.8 |
| Secondary refined         | 1.9  | 1.9  | 2.0  |
| Total refined             | 15.6 | 15.7 | 15.8 |
| Refined use (consumption) | 14.8 | 15.1 | 15.7 |

Source: International Copper Study Group, November 2002.

(1) SXEW = copper produced by solvent extraction and electrowinning.

Treatment and refining charges (TCRCs, or the price charged to smelt copper concentrates and to produce refined copper) declined to very low levels in 2002

because low copper prices resulted in mine closures. This meant that smelters had to compete for concentrate feeds. By July, spot contracts had declined to US\$35/t and US\$3.5¢/lb. BHP Billiton will consolidate its concentrate sales through one organization, giving it a 35% share of the world concentrate export market. In China, five smelter/refinery groups combined to negotiate purchases of copper concentrates through the China United Copper Co. Ltd.; these five operations produced over half of China's refined production in 2001 and so together import a large amount of concentrates. TCRCs are expected to rise when the Escondida mine increases its output of concentrates.

### Some Production Cutbacks for 2002

- Codelco, 106 000 t;
- Amarillo, 95 000 t;
- Tintaya, 90 000 t;
- Escondida, 80 000 t.

### Some Permanent Closures in 2002

- Gaspé smelter, 190 000 t/y;
- San Manuel mine/SXEW, 122 000 t/y.

### Some Planned Production Increases

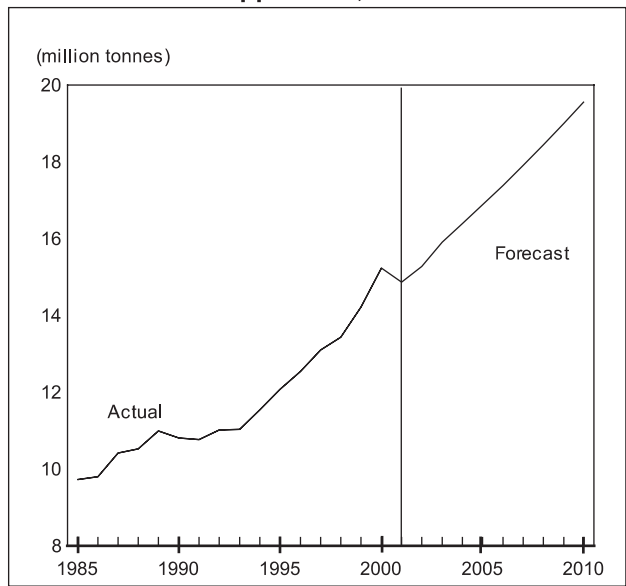
|                 | (000 t/y Cu)    |  |         |
|-----------------|-----------------|--|---------|
| El Teniente     | From 340 to 450 |  | By 2004 |
| Mt. Isa         | From 223 to 400 |  | By 2006 |
| Jiangxi         | From 220 to 375 |  | By 2003 |
| Tongling        | From 270 to 310 |  | By 2003 |
| Yunnan          | From 150 to 250 |  | By 2003 |
| Daye            | From 110 to 150 |  | In 2002 |
| Harjavalta      | From 170 to 250 |  | In 2004 |
| Pori            | From 125 to 250 |  | In 2004 |
| Caletones       | From 380 to 435 |  | By 2005 |
| Escondida Norte | From 0 to 80    |  | By 2004 |
| Altonorte       | From 400 to 800 |  | By 2003 |
| Olympic Dam     | From 235 to 600 |  | Unknown |

Codelco released an environmental impact statement of its smelting/refining project at Mejillones in Chile; the US\$1.25 billion operation would produce 1.4 Mt/y of cathode and start up in 2005.

## DEMAND OUTLOOK

The ICSG forecast in November (above) that demand would increase to 15.1 Mt in 2002 from 14.8 Mt in 2001; in subsequent years, use is forecast to rise to 15.7 Mt and 16.4 Mt in 2003 and 2004, respectively. Future demand will depend upon economic activity such as capital investment and construction.

**Figure 1**  
**World Refined Copper Use, 1985-2010**



Source: Natural Resources Canada.

## CANADIAN PRODUCTION OUTLOOK<sup>1</sup>

A number of copper mines are likely to close, having depleted their ore reserves; such mines include (see the table at the end of the Introduction for production in 2002):

- Bousquet, in 2002;
- Selbaie, in 2003;
- Louvicourt, in 2005?;
- Bouchard-Hébert, in 2005-2006; and
- Brunswick, in 2008?

Copper producers that are likely to start up include (pending approvals in many cases):

- Copper Rand 5000, in 2003;
- Montcalm, in 2004?;
- Duck Pond, in 2005-2006; and
- Voisey's Bay, in 2006.

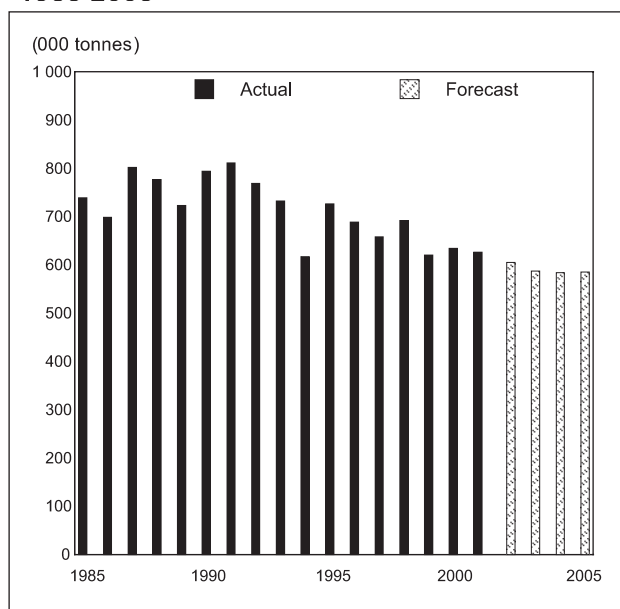
Copper mines that may start up if prices increase or if costs can be decreased include:

<sup>1</sup> Forecasts and projections are subject to change by such factors including changing copper prices, exploration successes or failures, ability to arrange financing, technological developments, and environmental permitting.

- Langlois;
- Mt. Milligan;
- Corner Bay;
- Mt. Polley;
- Izok Lake; and
- Gibraltar.

Construction of a 30 000-t/y hydrometallurgical refinery at the Gibraltar mine is also under consideration. Redcorp is awaiting a decision by the B.C. government about its planned Tulsequah Chief mine (see above). As Voisey's Bay nickel-cobalt concentrates begin to be smelted at Inco's Canadian operations, copper and nickel output from Inco's other Canadian operations will decrease.

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



Source: Natural Resources Canada.

## PRICE OUTLOOK

The LME settlement price for Grade A copper varied between US\$1421/t on January 3 and US\$1680/t on June 6; for the year, it appears likely to average US\$1556/t or US70.6¢/lb. LME inventories began 2002 at 799 500 t, peaked at 980 075 t on May 2, and then declined to less than 870 000 t by mid-November. Prospects for 2003 appear to be brighter than for 2002, perhaps averaging US\$1750/t, due in part to the cutbacks at a number of producers, provided that Chinese offtake continues unabated and that producers do not rush to bring idled capacity on stream with better prices. As with many other metals, the

continued expansion of the Chinese economy and its associated demand for metal imports is a key factor in determining market balances. Some warning signs such as rising inventories of finished goods in China may be a temporary hiatus in the economic expansion; if not, and if growth slows, copper prices will decline.

## ADDITIONAL INFORMATION

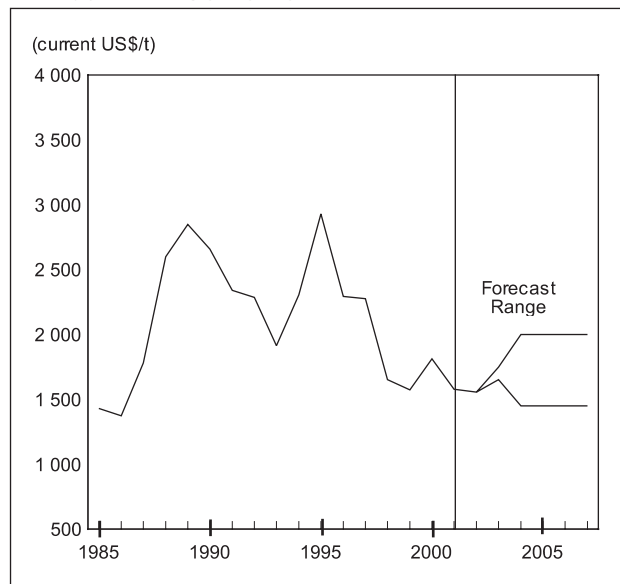
Additional information about Canadian companies is available on the Internet at [www.sedar.com/issuers/issuers\\_en.htm](http://www.sedar.com/issuers/issuers_en.htm). Canadian monthly copper statistics are available at [http://mmsd1.mms.nrcan.gc.ca/mmsd/data/default\\_e.asp](http://mmsd1.mms.nrcan.gc.ca/mmsd/data/default_e.asp). (Click on the file format of your choice. Copper statistics are located in Table 3.)

*Note: Information in this article was current as of November 20, 2002.*

### NOTE TO READERS

**The intent of this document is to provide general information and to elicit discussion. It is not intended as a reference, guide or suggestion to be used in trading, investment, or other commercial activities. The author and Natural Resources Canada make no warranty of any kind with respect to the content and accept no liability, either incidental, consequential, financial or otherwise, arising from the use of this document.**

**Figure 3**  
**Copper Prices, 1985-2007**  
Annual LME Settlement



Source: Natural Resources Canada.