

Nickel

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1998 mineral production: \$1.4 billion^P
 World rank: Second
 1998 exports: \$3.2 billion

Canada	1998	1999 ^e	2000 ^f
	(tonnes)		
Mine production	208 200	192 000	204 000
Refined production	146 700	132 000	130 000
Consumption	13 000	14 000	15 000

^e Estimated; ^f Forecast; ^P Preliminary.

Notes: Mineral production refers to recoverable content in concentrates shipped, whereas mine production refers to metal content in concentrates produced.

"Refined" production refers to "primary" nickel production, which includes refined nickel, nickel in nickel oxide sinter, and nickel in nickel chemicals.

Nickel's resistance to corrosion, high strength over a wide temperature range, pleasing appearance, and suitability as an alloying agent make it useful in a wide variety of applications. Major markets include stainless steel (65%), nickel-based alloys, electroplating, alloy steels, foundry products, and copper-based alloys. Nickel is intensively recycled; nickel in stainless steel scrap accounts for about 45% of nickel input to stainless steel-making.

ANNUAL AVERAGE SETTLEMENT PRICES, LONDON METAL EXCHANGE

1995	1996	1997	1998	1999 ^e
(US\$/lb)				
3.74	3.40	3.14	2.09	2.78

^e Estimated.

CANADIAN OVERVIEW

- Inco reduced its cash operating costs to US\$1.28/lb for the third quarter of 1999. In February, Inco reduced planned production to 185 000 t for 1999, shutting Levack/McCreedy West and the Little Stobie mines in mid-1999. Crean Hill will close in 2000 and Coleman will close in 2001.
- Workers at Inco's 45 000-t/y Thompson operations voted to strike and were locked out on September 15. Over 6000 t of nickel production was lost by early November. Inco reportedly needs \$250 million to deepen its Birchtree mine within five years to extend Thompson's life to 2016.
- The Voisey's Bay environmental panel recommended that the mine/concentrator proceed, subject to the panel's other recommendations. In areas of federal jurisdiction, the federal response on August 3 agreed with the recommendations or the intent of the recommendations.
- In March, the court rejected arguments that the panel needed to consider smelter/refinery impacts when reviewing the Voisey's Bay mine/mill. In July, the Labrador Inuit Association (LIA) voted to accept a land claims agreement in principle negotiated with the federal government. In September, the LIA and the Innu Nation sought judicial reviews of the federal response; this was put into abeyance until the end of November while the parties discuss environmental management. In October, the Nunavik Inuit of Quebec went to court about federal land claims negotiations with the LIA.
- Inco and the Newfoundland government had no formal negotiations about building a smelter/refinery in the province. In August, Inco announced a new \$6.3 million exploration program at Voisey's Bay and resumed negotiations with the Innu Nation and LIA, hoping to conclude two Impacts and Benefits Agreements (IBAs). Inco hopes to start construction in June 2000 if outstanding negotiations can be completed by year-end.

- Canmine purchased the hydrometallurgical cobalt-nickel refinery operated by Cobatec until its bankruptcy. Canmine intends to produce cobalt chemicals there with feed from its Werner Lake cobalt mine. Canmine continued exploration at its 2000-km² BINCO project along a magnetic lineament northeast of Thompson, Manitoba. Canmine also owns the Maskwa nickel property, a former producer with reserves of 2.9 Mt grading 1.27% nickel, 0.21% copper and 0.04% cobalt.
- Falconbridge's smelter had problems; in April, its planned 1999 production was cut from 86 000 t to 79 000 t. After a second smelter shut-down in September, planned production was cut to 75 000 t. Falconbridge hopes to raise output at Raglan from 21 000 t/y to about 26 500 t/y by debottlenecking. To help reduce operating costs to US\$1.30/lb by 2000, Falconbridge's Sudbury operations were split into two business units.
- Sherritt operated its refinery at Fort Saskatchewan, Alberta, at record rates in the third quarter; the refinery produced 20 482 t of nickel and 1962 t of cobalt in the first nine months of the year. Sherritt sources about 95% of its nickel feed from Moa Bay, Cuba. Sherritt and a Cuban state producer operate the mine and refinery as a joint venture.
- WMC's furnace was shut down from January 6 to March 6. WMC cut production at Kambalda to 10 000 t/y. In total, WMC's planned nickel production for 1999 was cut to 86 000 t from 110 000 t in 1998.
- In Russia, RAO Norilsk cut production by 15 000 t in 1999 to modernize some facilities at the Severonikel and Norilsk Kombinats. RAO Norilsk outlined a 10-year, US\$3 billion modernization plan.
- In New Caledonia, Inco began testing proprietary acid pressure leach technology at Goro. If successful, Inco may build a 27 000-t/y plant to produce nickel oxide by late 2003. SLN will decide in 2000 whether to expand its Doniambo smelter by 10% to 70 000 t/y. Falconbridge is spending \$25 million/y to evaluate a 54 000-t/y ferronickel smelter.
- In Indonesia, Aneka Tambang modernized and restarted one production line and expects to produce 9400 t of nickel in ferronickel in 1999; PT Inco borrowed US\$200 million from Inco (who raised US\$270 million by selling stock) to complete an expansion to 68 000 t/y of nickel in matte; PT Inco's production was constrained by below-average rainfall.

WORLD OVERVIEW

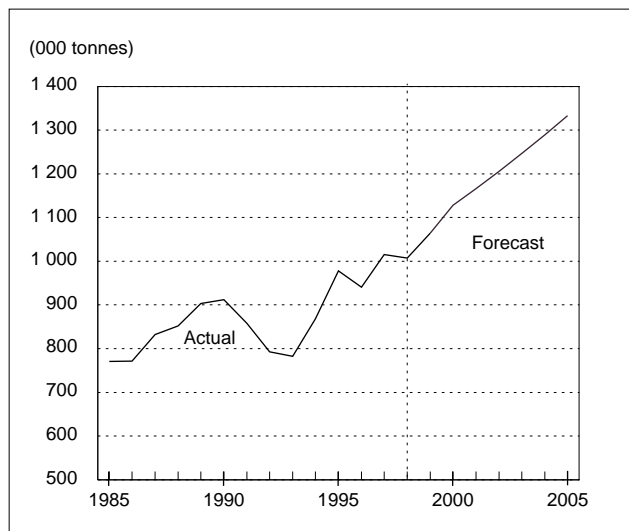
- In Australia, three new laterite projects – Bulong, Cawse and Murrin Murrin – had less success than forecast. Bulong produced commercial nickel in April. In December, the 9600-t/y plant is expected to operate at capacity. Cawse shipped its first nickel cathodes in February; the 9000-t/y operation was cash-flow-positive in August. Cawse expects to apply for London Metal Exchange certification in December.
- Anaconda Nickel received two votes of confidence in 1999: Sherritt bought \$45 million of Anaconda stock, and then Anglo American bought A\$320 million worth. Anaconda's Murrin Murrin project was officially opened in August but it will not operate at its design capacity (45 000 t/y) before July 2000. Anaconda's plans to develop other laterites depend upon it successfully operating Murrin Murrin Stage I. Anaconda will fund a feasibility study to expand Bulong's capacity from 9000 t/y to 40 000 t/y.
- Billiton will fund an A\$10 million evaluation of Comet's 35 000-t/y, A\$870 million Ravensthorpe project and will spend A\$200 million to expand capacity at Yabulu to 65 000 t/y of nickel, cutting costs to US\$1.50/lb.

- Companies and possible nickel laterite projects, respectively, include: Anaconda, Stage II (70 000 t/y); Anaconda, Mt. Margaret (100 000 t/y); Argosy, Nakety (20 000 t/y); Black Range, Syerston (25 000 t/y); Centaur, Stage II (35 000 t/y); Comet/Billiton, Ravensthorpe (35 000 t/y); Falconbridge, Koniombo (54 000 t/y); Highlands Pacific, Ramu (33 000 t/y); Inco, Goro (27 000 t/y); Mindex/Crew, Mindoro (40 000 t/y); Philnico, Nonoc (38 000 t/y); Preston/Anaconda, Bulong II (31 000 t/y); Preston, Marlborough (27 000 t/y); and Weda Bay, Halmahera Is. (45 000 t/y).

CONSUMPTION OUTLOOK

World primary nickel consumption is forecast at 1.06 Mt in 1999, up from 1.007 Mt in 1998, reflecting a recovery from Asian financial woes. Stainless steel production should reach 17 Mt. In 2000, primary nickel consumption is expected to be 1.12 Mt, reflecting stainless steel production of nearly 18 Mt. In the short term, nickel consumption is expected to grow faster than its long-term trend (over 3%/y) as the present "boom" in stainless steel makes up for earlier stagnation. In any year, actual consumption is a function of world industrial activity. Nickel consumption is forecast to reach 1.5 Mt/y by 2010.

Figure 1
World Nickel Consumption, 1985-2005



Source: Natural Resources Canada.

PRODUCTION OUTLOOK

The Thompson strike will cause primary nickel production to fall in 1999. Canadian primary nickel mine production may reach 204 000 t in 2000 due to increased Raglan output and Inco's productivity efforts (assuming no strikes or unforeseen production interruptions – labour contracts for operations in Sudbury end in 2000). If Voisey's Bay negotiations are satisfactory to all parties before year-end, Inco could start construction in mid-2000. If construction is delayed and if Goro testing is favourable, Inco could proceed with Goro instead. Canmine's Maskwa mine could be the next new nickel producer in Canada. Given the uncertainty about Voisey's Bay and its size, a forecast of Canadian nickel production is not presented here.

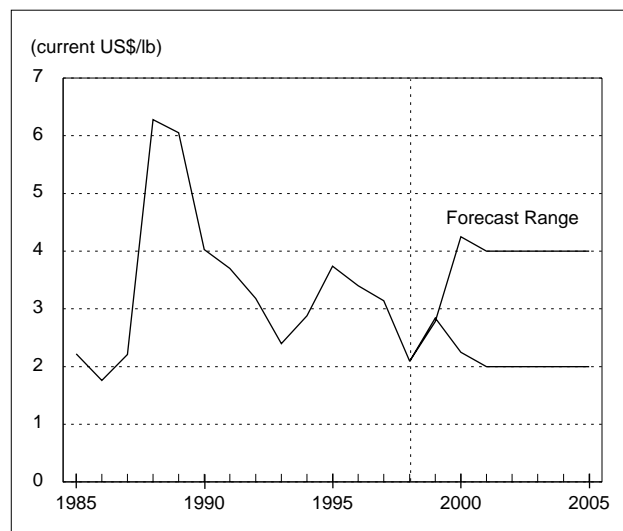
PRICE OUTLOOK

Nickel prices increased in 1999 supported by production cuts, an LME inventory that by November 12 had declined by 20 000 t from the year high of 66 000 t and, in the second half of the year, very robust demand for stainless steel. Nickel prices are forecast to remain volatile in 2000 as LME inventories decline, laterite producers continue start-ups, producers re-open shut capacity, high prices encourage authorization of new projects, and stainless steel demand continues to be robust, at least for the first half of 2000. An average price of US\$3.00/lb is forecast for 2000. The major uncertainty is the degree to which Australian laterite producers achieve rated

capacity. Lower nickel prices since mid-1997 have helped stainless steel gain new markets, but the higher nickel prices of late 1999 and early 2000 will tend to throttle nickel and stainless steel demand growth.

The nickel market is small compared to the aluminum, copper or zinc markets, so nickel prices are more volatile. Long-term annual nickel prices are expected to remain within a range of US\$2.00-\$4.00/lb (in current U.S. dollars of the day). However, successful operation of the new laterite projects at rated capacities will put pressure on this price range. As always, there remains a possibility of unpredictable supply interruptions that cause short-lived price spikes. The trend in the annual price range in current U.S. dollars is projected in Figure 2.

Figure 2
Nickel Prices, 1985-2005
Annual LME Settlement



Source: Natural Resources Canada.

Note: Information in this article was current as of November 12, 1999.

NOTE TO READERS

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