

Nickel

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1997 mineral production: \$1.78 billion^P
 World rank: Second
 1997 exports: \$2.1 billion

Canada	1997	1998 ^e	1999 ^f
	(tonnes)		
Mine production	190 500	191 000	209 000
Refined production	131 600	129 000	142 000
Consumption	17 000	17 500	16 800

^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 are characteristics that make it useful in a wide variety of applications. Major markets for nickel include stainless steel (65%), nickel-based alloys, electroplating, alloy steels, foundry products, and copper-based alloys. Scrap is an important nickel source for stainless steel producers, accounting for 45% of their nickel inputs.

ANNUAL AVERAGE SETTLEMENT PRICES, LONDON METAL EXCHANGE

1994	1995	1996	1997	1998 ^e
(US\$/lb)				
2.88	3.74	3.40	3.14	2.10

^e Estimated.

CANADIAN OVERVIEW

- An environmental panel evaluating Inco's Voisey's Bay project heard presentations from September to November 1998. The panel is expected to submit recommendations by mid-February 1999.
- Inco and the Government of Newfoundland and Labrador broke off negotiations on whether the mining licence for Voisey's Bay would include a requirement to smelt and refine the entire output in the province. The provincial government tabled amendments in the Legislative Assembly on November 17 to remove ambiguity about the Government's ability to order smelting and refining within the province. The amendments were also intended to reduce the Government's exposure to legal challenge.
- Inco continued cutting costs in 1998; work force reductions should total 1390 by year-end. In April, Inco announced plans to develop 5.9 Mt of ore grading 3.5% nickel and 3.1% copper to the 2500-m level at the Creighton mine. The company also shut down its Shebandowan and Whistle mines as previously scheduled. Others slated to close include: Levack/McCreedy West in late 1999, Froid and Crean Hill in 2000, and Coleman in 2001. The Birchtree deepening project, the Garson mine, and the low-grade area at the Stobie mine are tentatively operating after a worker-management agreement on "non-traditional" cost-cutting.

- In July, Inco announced that production from its Canadian mines would decline from 100 000 t/y to 80 000 t/y over two to three years. In October, Inco forecast its 1998 production at 425 million lb (192 800 t), down 20 million lb from the previous forecast.
- Inco and Jubilee Gold Mines of Australia agreed that Jubilee may elect to supply Inco with 10 000 t/y of nickel in concentrate or ore for three years. The plan is subject to Jubilee obtaining financing, licences, and native title agreements. Jubilee must make a decision before September 30, 1999.
- Falconbridge officially opened its new Raglan mine on July 15, 1998. Planning to increase production at Raglan was slowed by low metal prices.
- Sherritt continued de-bottlenecking its refinery in Fort Saskatchewan, Alberta. Its production reached a record level in the third quarter of 1998 as Sherritt continued to operate the plant to maximize cobalt output.
- Cobatec filed for protection under the Canadian *Bankruptcy and Insolvency Act* in October to give it time to restructure its finances and debt. Cobatec continued to expand its solvent extraction plant in Ontario, operating with feed from Cuba.
- January-September Russian nickel exports to non-C.I.S. destinations totalled 154 500 t, down 4.6% from the same period in 1997. Scrap exports declined due to low prices; merchants noted declining grades of scrap exported. Russia may tax its exports of nickel scrap in 1999.
- Other production cuts were announced in 1998. The major ones include an 8000-t cut at Falconbridge's Dominican Republic smelter and 10 000 t/y of closures at WMC in Australia.
- In September, Billiton made an offer for the outstanding shares of QNI Ltd. at a premium of over 30% above share value at the time.
- Falconbridge expanded its refinery capacity in Norway by 25% to 85 000 t/y. In New Caledonia, the company signed a joint-venture agreement with Société Minière du Sud Pacifique (SMSF) to investigate building a 54 000-t/y ferronickel smelter.
- Inco and BRGM (85% and 15%, respectively) are proceeding with construction of a pilot operation to test Inco's hydrometallurgical process on ore from their Goro deposit. Start-up is scheduled for mid-1999. A decision is expected in 2000 on whether or not to proceed with a plant with initial capacity of 27 000 t/y of nickel plus 2700 t/y of cobalt. Inco stated that it was seeking additional partners. Ore reserves are 165 Mt grading 1.60% nickel and 0.16% cobalt.

WORLD OVERVIEW

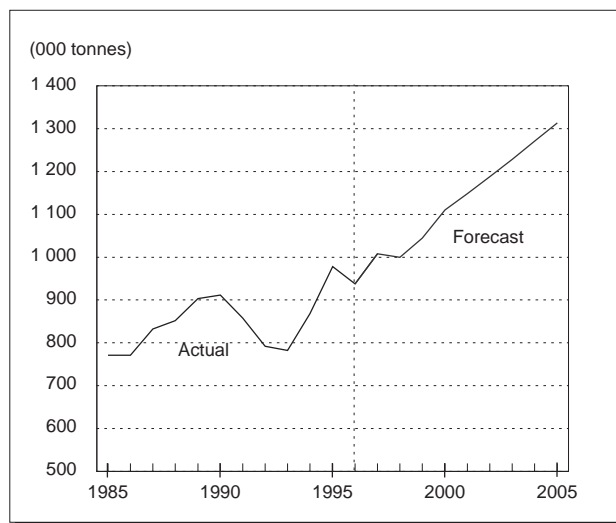
- The progress of Australia's three nickel-cobalt laterite hydrometallurgical projects was closely followed by the nickel industry. Initial production is expected by year-end from the 8500-t/y Ni Cawse and 9000-t/y Bulong projects. The 45 000-t/y Murrin Murrin project is expected to produce initial metal early in 1999. Operators expect to reach full production capacity within 18 months.
- Anaconda Nickel announced its intentions to begin the second stage of the Murrin Murrin project to raise output to 115 000 t/y of nickel plus cobalt. The financing has not yet been raised.
- Calliope Metals plans to complete a bankable feasibility study, environmental study and financing arrangements in 1999 for a 35 000-t/y, US\$600 million nickel pressure acid leach refinery at Nakety, New Caledonia. The planned ore feed to the plant grades 1.47% nickel and 0.12% cobalt.
- A bankable feasibility study of the Ramu nickel-cobalt laterite deposit in Papua New Guinea was completed in October. The nickel output envisaged is 33 000 t/y from an orebody grading 1.01% nickel and 0.1% cobalt.

- Preston Resources bought the Bulong project for A\$319 million. It also owns the Marlborough lateritic nickel-cobalt project. The Queensland government approved six of ten mining leases at Marlborough; the remaining four require native claim issues resolution. Preston plans to seek financing for a 19 400-t/y nickel plus 1600-t/y cobalt facility in 1999.

CONSUMPTION OUTLOOK

World primary nickel consumption is forecast at 1.0 Mt in 1998, a drop of 0.8% from the 1.08 Mt in 1997, reflecting the effects of the continued financial crisis that began in Asia in 1997. Stainless steel production in 1998 is expected to be up marginally to 16.75 Mt; anti-dumping actions further complicated the stainless steel market. Primary nickel consumption is expected to increase in 1999 to 1.05 Mt, reflecting increased stainless steel consumption, which will reach 17.5 Mt. Assuming world financial crises are largely solved by mid-1999, the consumption of stainless steel in 2000 may reach 18.5 Mt, thereby raising primary nickel consumption to 1.1 Mt. Thereafter, nickel consumption is projected to increase at an average rate of about 3.4%/y, with actual consumption in any year either above and below this trend line.

Figure 1
World Nickel Consumption, 1985-2005



Source: Natural Resources Canada.

PRODUCTION OUTLOOK

Canadian mine production of primary nickel is expected to reach 201 000 t in 1998. Thereafter, the level of Canadian production is dependent upon the direction of nickel prices. With low nickel prices expected to continue in 1999, Canadian nickel production is expected to decline as Inco closes mines between 1999 and 2000. Raglan's output in 1999 is expected to be higher than in 1998, its start-up year. Thereafter, the future is less clear.

At Voisey's Bay, if the environmental panel recommends proceeding with the mine and the mill, obstacles still remain: a decision is pending in a court case whether a nickel smelter and refinery should have also been evaluated; the province and Inco disagree about building a smelter and refinery in the province; land claims between the provincial and federal governments and the two Aboriginal groups in the area have not been resolved; and negotiations for separate impacts and benefits agreements between Inco and the two Aboriginal groups have not been completed.

Continued low prices threaten the ability of Canadian producers to maintain planned production levels and ore reserves. If costs cannot be controlled, cut-off grades will increase and ore reserves will decrease. Because of the uncertainties and because there are only two major producers, a quantitative forecast for production beyond 1999 is not included this year.

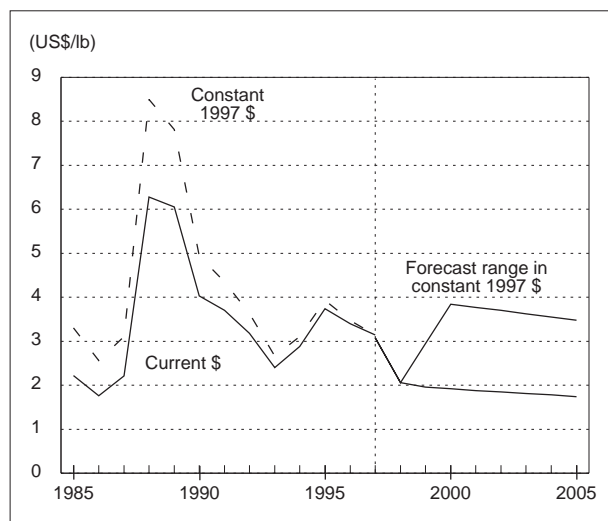
PRICE OUTLOOK

Because inventories crept upward in late 1998, nickel prices are forecast to remain low in 1999, averaging US\$2.10/lb or US\$4630/t in current dollars (or \$2.06/lb in 1997 U.S. dollars). The most significant uncertainties with respect to prices are the success of the Australian start-ups, the level of Russian exports, and the economic recovery in Asia. If the Australian projects, Murrin Murrin in particular, encounter significant and sustained problems, prices may increase, boosting volatility.

Throughout 1998, while producers made painful and public choices to shut down or cut back operations, individual consumers of nickel and stainless steel quietly and independently were finding increased applications, thereby providing a base for healthy future increases in demand. The inevitable price increase that is expected to result from a contraction of supply concurrent with an expansion of demand will be tempered by the prospect of lower-cost nickel laterite production.

The nickel market is small compared to aluminum, copper or zinc markets. This translates into higher volatility than exists for other major nonferrous metals. Given this volatility, the long-term nickel price is not expected to remain outside a range of US\$2.00-\$4.00/lb (in 1997 U.S. dollars) for extended periods. Average long-term prices are projected at about US\$3/lb. Some decrease in costs and prices is expected due to increased technological efficiency; this is shown by the negative slope of the range of projected prices in Figure 2.

Figure 2
Nickel Prices, 1985-2005
Annual LME Settlement



Source: Natural Resources Canada.