

Foreword

The Minerals and Metals Sector is the focus of federal expertise for mineral and metal commodity information. Within the Sector, The Mineral and Metal Policy Branch acts as the federal government's main source of in-depth knowledge, intelligence and expertise on mineral and metal commodity markets. One of its tasks is to forecast mineral and metal demand, supply and price.

Within the Branch, the International and Domestic Market Policy Division is responsible for the major base metals, the precious metals, certain associated minor by-products, and the secondary materials such as scrap.

The commodity specialists of the Division maintain close contact with industry on a wide range of topics and issues. This year-end publication represents a more formal means to disseminate metal market developments through the first three quarters of the year and forecasts to the year 2005. We would appreciate your feedback and encourage you to contact the specialists directly with your comments by telephone, facsimile or electronic mail (number and e-mail addresses are provided at the beginning of each chapter). You can also provide feedback to the coordinator of this publication, Patrick Chevalier, at tel. (613) 992-4401, fax (613) 943-8450, or e-mail pcheval@nrcan.gc.ca.

Denis Lagacé
Acting Director General
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This Outlook has been prepared based on information available to Natural Resources Canada (NRCan) at the time of writing. The authors and NRCan 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.

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Introduction

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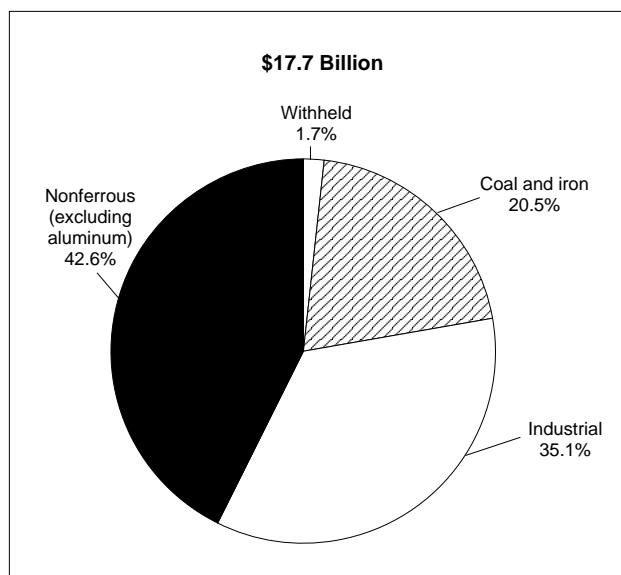
This outlook for the major nonferrous metals was prepared by staff of the International and Domestic Market Policy Division in early November 1999 and reflects the market conditions and expectations at that time.

Canada's economy registered strong growth in 1998 and is expected to continue to grow over the near-term forecast period. Overall real Gross Domestic Product (GDP) increased by 3.1% in 1998. The mineral industry (excluding the petroleum and natural gas industries) accounted for \$26.5 billion, or 3.7% of Canadian GDP. Despite the overall growth registered in the Canadian economy, low commodity

prices, brought about largely by reduced demand in Asia, resulted in a decline in the total value of Canadian mineral production to \$44.3 billion in 1998, a 12.3% decrease from the \$50.5 billion recorded in 1997. The value of metal production declined to \$10.3 billion from \$11.5 billion, a decrease of 10.7%, due mainly to a sharp drop in the values of production of zinc (-20.5%), nickel (-20.1%), lead (-20.0%), copper (-17.4%) and gold (-8.1%).

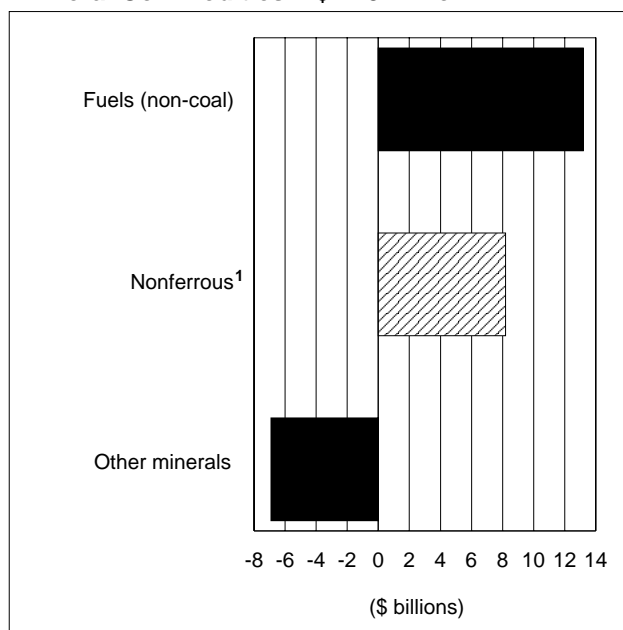
The value of all minerals and mineral product exports also declined to \$69.3 billion in 1998, a 5.1% drop compared to 1997. The value of fabricated metal product exports increased by about 15% in 1998 as exports to the United States increased significantly. In spite of the decline in the value of exports and an increase in mineral product imports, Canada's overall trade surplus for these products stood at a healthy \$15.6 billion.

Figure 1
1998 Canadian Mine Production



Source: Natural Resources Canada.

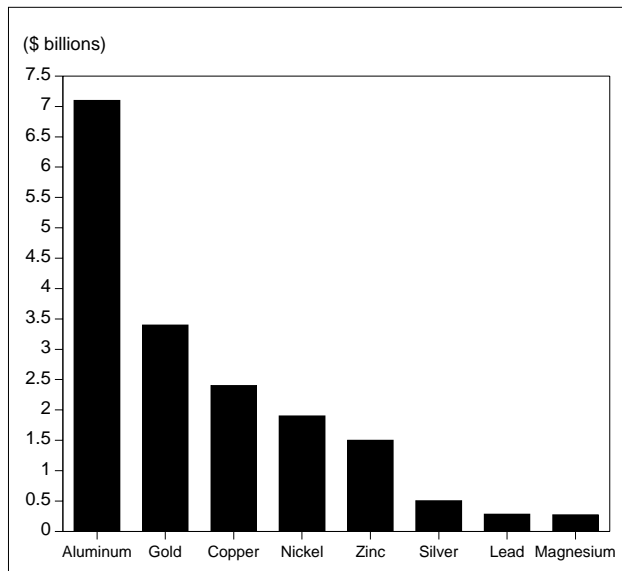
Figure 2
1998 Net Export Earnings
Mineral Commodities = \$14.5 Billion



Source: Natural Resources Canada.

¹ Includes aluminum.

Figure 3
1998 Value of Exports (Stages I to IV)



Source: Natural Resources Canada.

In the first six months of 1999, GDP grew by an annualized 3.7%. Overall, Canada's economic growth is expected to be higher than previously expected in 1999, mainly because of stronger investment in both residential construction and machinery and equipment. Government fiscal policies aimed at reducing deficits and debt, and monetary policies aimed at keeping inflation under control, have contributed to this environment and provide a sound basis for continued strong growth in Canada. The Canadian economy is projected to expand by 3.5% in 1999 and by 2.5% in 2000.

Despite the fall in commodity prices and values of production and exports in 1998, the mining industry remains a vital contributor to the Canadian economy. The mining and mineral processing industries directly employed some 367 200 Canadians in 1998, a 4.1% increase over the 1997 level of 352 900. Losses in employment in the mining sector were offset by increases in the smelting and refining, semi-manufacturing and manufacturing sectors. Of these, 55 700 were employed in mining, 59 600 in smelting and refining, and nearly 251 900 in the manufacture of mineral and metal products.

Nonferrous metals are the second most important sector in terms of value of Canadian mineral production after non-coal fuels (crude oil, natural gas and uranium). With a total value of \$7.6 billion in 1998, nonferrous metals (excluding aluminum, which is not mined in Canada) accounted for 43% of the value of non-fuel mineral production. When aluminum production is added, the value of Canada's non-ferrous metal production increases to an estimated \$12.4 billion.

In 1998, nonferrous metals generated a net trade surplus equivalent to about 62% of that of mineral fuels (excluding coal). Canada's overall merchandise export surplus was due in large part to the net surplus generated by the Canadian mining industry. Non-coal fuel minerals generated a net surplus of \$13.2 billion. Nonferrous metals (including scrap), with exports of \$18.8 billion and imports of \$10.7 billion, generated a net Canadian trade surplus of \$8.2 billion. Other mineral products generated a combined net trade deficit of \$6.9 billion.

Reviews and forecasts for aluminum, copper, magnesium, nickel and zinc are included in the following pages. Trade tables covering 1997, 1998 and the first nine months of 1999 follow these commodity reviews.

We would appreciate your feedback, and encourage you to contact the specialists directly with your comments by telephone, facsimile or electronic mail.

Aluminum

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1998 primary metal production: \$4.8 billion^e
 World rank: Third
 Exports (unwrought): \$4.2 billion
 Installed capacity: 2.247 Mt/y

Canada	1997	1998 ^P	1999 ^e	2000 ^f
	(000 tonnes)			
Production	2 327	2 374	2 370	2 400
Apparent consumption	628	734	840	950

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

Aluminum, in both its pure and alloyed form, is used to make a wide variety of products for the consumer and capital goods markets. Aluminum's largest markets are transportation (29%), packaging (22%), building and construction (13%), electrical (7%), consumer goods (7%), and machinery and equipment (6%). North America is the largest consuming region in the world, accounting for 35% of total Western World demand. Europe accounts for another 31% and Asia accounts for 24%.

AVERAGE (THREE-MONTH) ALUMINUM PRICES, LONDON METAL EXCHANGE

1995	1996	1997	1998	1999 ^e
(US\$/t)				
1 832	1 535	1 619	1 379	1 385

^e Estimated.

CANADIAN OVERVIEW

- Alcan Aluminium Limited has completed approximately one third of the Alma smelter. This 375 000-t/y plant will replace the Isle Maligne smelter and will expand Alcan's primary metal production by 300 000 t/y. The Alma smelter is expected to start producing metal in the fall of 2000.
- Alcan, along with Pechiney Corporation of France and Alusuisse Lonza Group Limited (algroup) of Switzerland, announced a proposed merger on August 11, 1999. Once completed, this merger would create one of the largest aluminum companies in the world. The three companies currently have 91 000 employees, will produce approximately 18% of Western World primary aluminum production, and have combined estimated 1999 sales of approximately US\$23 billion. The merger is subject to regulatory and other approvals and is expected to be completed in mid-2000.
- In March, Alcan Aluminium Limited announced that it would invest US\$46 million in its Kingston, Ontario, facilities to expand production of aluminum rolled sheet for the automotive and distribution markets. The expansion, to be completed by the end of 2000, will increase capacity by 40%.

Additional information on Alcan, including the merger with Pechiney and algroup, can be obtained through the Alcan web site at <http://www.alcan.com/>.

- The Aluminium Association of Canada links the Canadian aluminum industry, aluminum users, the public and government. Further information and web sites of Canadian primary aluminum producers can be found on the Association's web site at <http://www.aia.aluminium.qc.ca>.

WORLD OVERVIEW

- Alcoa Inc. and Reynolds Metals Company Limited announced a proposed merger of their respective companies on August 11, 1999. Once completed, this merger would create one of the largest

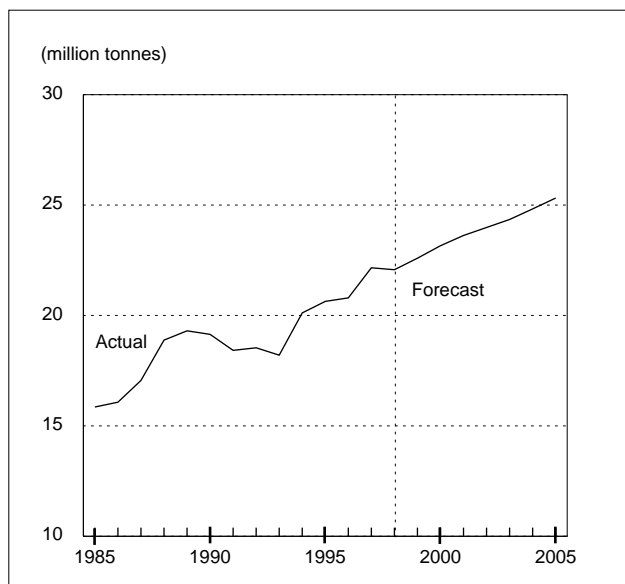
aluminum companies in the world. The two companies currently have 123 500 employees, combined production of approximately 24% of world primary aluminum production, and combined estimated 1999 sales of US\$22 billion. The merger is also subject to regulatory and other approvals and is expected to be completed in mid-2000. Additional information can be obtained from Alcoa's web site at <http://www.alcoa.com/>.

- Kaiser Aluminum and Chemical Corporation notified customers on July 7, 1999, that a July 5 explosion at its Gramercy, Louisiana, alumina refinery required it to declare force majeure on its commitments. The Kaiser Board of Directors approved reconstruction and expected to have the plant in full operation by the end of 2000. Additional information can be obtained from the Kaiser web site at <http://www.kaiseral.com/>.
- Although the alumina market was weak earlier in the year, alumina supplies became more difficult to obtain for those customers without long-term contracts or other sources as a result of the lost production at Gramercy. Prices for alumina have moved up sharply from approximately US\$150/t to over \$300/t near the end of 1999 as increases in production from other sources in Australia, Brazil, China and Russia were not sufficient to balance the lost production on short-term markets.
- Expansions of primary facilities around the world continue. In addition to the capacity creep, a number of small Chinese smelters have announced plans for production increases while others have completed smaller expansions. In addition, Dubal Aluminum completed its expansion to a capacity of 536 000 t/y in October, and a capacity expansion at Noranda's New Madrid, Missouri, smelter to 253 000 t/y is expected to be completed by year-end.

CONSUMPTION OUTLOOK

World consumption of primary aluminum is estimated to be 22.6 Mt in 1999, approximately 2% higher than the 22.1 Mt recorded in 1998. Western World demand is also expected to increase by approximately 3% to 19.2 Mt in 1999. In 2000, world demand for aluminum is expected to increase approximately 3% from 1999 levels. In the longer term, annual growth of 2-3% is forecast for the early part of the next decade. The transportation and packaging markets are expected to lead the increase in demand for aluminum to the year 2005. Canadian consumption of primary aluminum is expected to remain strong at about 750 000 t for 1999, increasing, over the longer term, at a rate of about 5-6% annually.

Figure 1
World Aluminum Consumption, 1985-2005



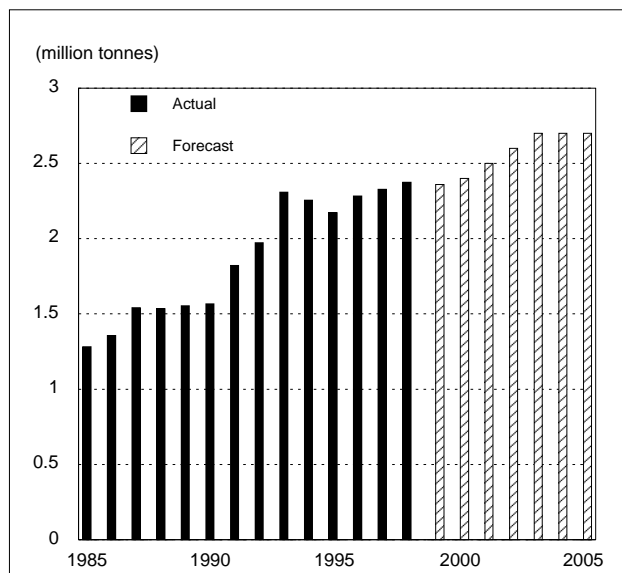
Source: Natural Resources Canada.

CANADIAN AND WORLD PRODUCTION OUTLOOK

Canada is forecast to produce about 2.4 Mt of primary aluminum in 1999. It produced 2.374 Mt in 1998 valued at an estimated \$4.8 billion, ranking it third after the United States and Russia. Additional details of Canada's production statistics can be obtained on the Internet at <http://www.nrcan.gc.ca/mms/efab/data/default.html>. Although Canadian aluminum production capacity increased substantially during the latter half of the 1980s, it has remained relatively stable during the 1990s. Canadian production capacity is forecast to increase to over 2.6 Mt in 2000 with the completion of Alcan's Alma smelter. Other smelter expansion projects in Quebec (at Alouette, A.B.I. and Lauralco) are dependent on the negotiation of new long-term powersupply contracts with Hydro-Québec. Decisions on possible new capacity in British Columbia are still pending.

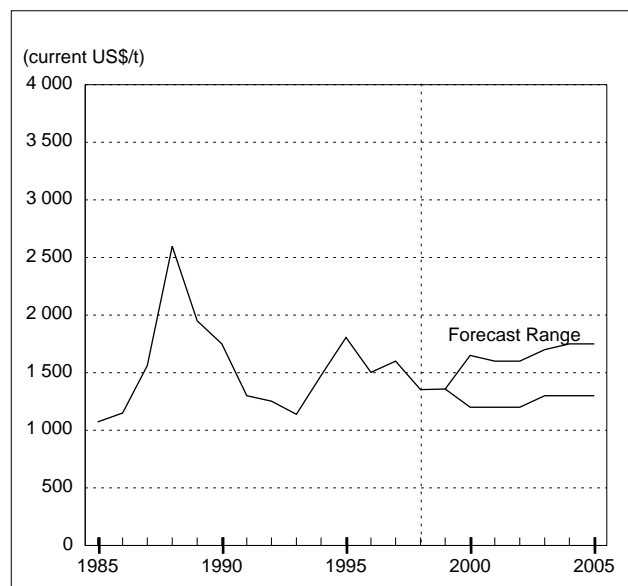
World production of primary aluminum is expected to increase to over 23 Mt in 1999 from 22.6 Mt in 1998. Western World production is expected to increase to 16.9 Mt, up from 16.6 Mt in 1998. Aluminum production in 1999 is expected to be about 3.8 Mt in the United States, 3.9 Mt in Western Europe, and 3.2 Mt in Russia.

Figure 2
Canadian Primary Aluminum Production,
1985-2005



Source: Natural Resources Canada.

Figure 3
Aluminum Prices, 1985-2005
Annual LME Settlement



Source: Natural Resources Canada.

PRICE OUTLOOK

Metal prices have been volatile over the last few years and, in 1999, prices for aluminum were no exception. Cash prices for primary grade aluminum started the year at approximately US\$1200/t (55¢/lb), declined to a low of \$1140/t (52¢/lb) in March, and rose to above \$1500/t in September. London Metal Exchange inventories, which began the year at about 635 000 t, increased to 822 000 t in March and decreased to below 800 000 t late in the year (approximately 13 days of world primary consumption). For 2000, prices are forecast to be between US\$1200 and \$1650/t. In the longer term, prices are expected to continue their volatility between US\$1200 and \$1800/t (55¢ and 82¢/lb). Metal prices can be obtained from various news services, journals and newspapers, as well as from the London Metal Exchange web site at <http://www.lme.co.uk/> and from <http://metalprices.com/>.¹

¹ Please note the caveats on using these metals prices published here and on web sites such as those mentioned above. Readers should verify and confirm that the data are appropriate for their use.

Note: Information in this article was current as of November 19, 1999.

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Copper

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1998 production:	\$1.69 billion
World rank (mine production):	Third
Exports (concentrate and unwrought):	\$1.83 billion

Canada	1998	1999 ^e	2000 ^f
	(000 tonnes)		
Copper mine production	692	625	677
Refined copper production	562	556	608
Refined consumption	246	264	288

^e Estimated; ^f Forecast.

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 consumed annually is used for electrical applications, mostly as wire.

ANNUAL AVERAGE SETTLEMENT PRICES, LONDON METAL EXCHANGE

1995	1996	1997	1998	1999 ^e
(US\$/t)				
2 930	2 294	2 276	1 654	1 570

^e Estimated.

CANADIAN OVERVIEW

- Low copper prices forced the joint owners of the Highland Valley copper mine to suspend production on May 15, 1999, following unsuccessful attempts to secure a new labour agreement with the United Steelworkers of America that would have included wage concessions required to keep the mine profitable. At the time of closure, copper prices were at US65¢/lb, below the mine's estimated cash production cost of US68¢/lb. On August 30, 1999, employees ratified a collective bargaining agreement and labour-related terms of an economic plan prepared by the British Columbia Job Protection Commission that included discounts on wages, electricity and other supplies, allowing the mine to re-open. Highland Valley is owned by Cominco Ltd. (50%), Rio Algom Ltd. (33.6%), Teck Corporation (13.9%) and Highmont Mining Co. (2.5%).
- In mid-April, Royal Oak Mines Inc., the owner of the Kemess copper-gold mine in north-central British Columbia, was forced into receivership after a lengthy struggle against the combined effects of low metal prices and a high debt load. In October, Northgate Exploration Ltd. reached an agreement with the court-appointed interim receivers, PricewaterhouseCoopers, to purchase the mine. The mine reached commercial production levels in October 1998 and is expected to produce an average of approximately 7800 kg/y of gold and 27 000 t/y of copper over a mine life of approximately 16 years.
- Production at Boliden Limited's Myra Falls underground zinc-copper mine on Vancouver Island resumed at the end of March 1999 after a three-month shut-down to carry out rehabilitation and development work to address challenging ground conditions in the Battle zone. The mine produced 15 500 t of copper in concentrate in 1998.
- Hudson Bay Mining & Smelting (HBMS) announced plans to develop its new 777 deposit near Flin Flon, with production expected to begin in 2003. Production from 777 will replace output from other mining operations in the area that are scheduled to close due to the exhaustion of ore reserves. The deposit is estimated to contain a

resource of about 14.5 Mt grading 2.9% copper and 5.0% zinc, plus gold and silver.

WORLD OVERVIEW

- In the United States, Broken Hill Proprietary Co. (BHP) announced in June that it would close its Robinson and San Manuel mine operations and its 340 000-t/y San Manuel smelter and refinery. Phelps Dodge also announced in June the temporary closure of its Hidalgo smelter and the smaller of two concentrators at its Morenci, Arizona, mining complex. In July, Asarco announced that it would reduce production at its Mission mine by about 25 000 t/y.
- In September, Phelps Dodge agreed to purchase Cyprus Amax for US\$1.8 billion. Phelps Dodge's actions were prompted by an announcement in July by Asarco and Cyprus that they intended to merge. Phelps Dodge had originally bid to take over the merged Cyprus/Asarco; however, Asarco backed out of the deal in October and accepted an improved offer by Grupo Mexico to purchase its assets for US\$1.18 billion. As a result of these mergers, Phelps Dodge will rank as the world's second-largest copper producer behind the Chilean state-owned producer Codelco (Corporacion Nacional del Cobre de Chile) and followed by Grupo Mexico.
- In January, commercial production began at the US\$1.76 billion Collahuasi copper mine in Northern Chile owned by Falconbridge (44%), Minorco SA (44%) and a consortium of Japanese companies (12%) that includes Mitsui and Co., Ltd., Nippon Mining & Metals, and Mitsui Mining & Smelting Co. Ltd. The mine expects to produce close to 440 000 t of copper in concentrate and 50 000 t of copper cathode in 1999.
- Production at the US\$1.3 billion Los Pelambres mine, located 200 km north of Santiago, Chile, began in November. The 246 000-t/y mine is a joint venture between Anaconda Chile S.A. (60%) and a Japanese consortium (40%) that includes Nippon Mining, Marubeni, Mitsui, Mitsubishi Material Corp., and Mitsubishi Corp.
- The Batu Hijau copper-gold mine in Indonesia also began production in November. The mine is expected to produce an average of about 270 000 t/y of copper and 14 900 kg/y of gold in the first five years of the mine life. The project is owned by Newmont Mining Corporation (45%), Sumitomo Corporation (35%) and P.T. Pukuafu Indah (20%).

CONSUMPTION OUTLOOK

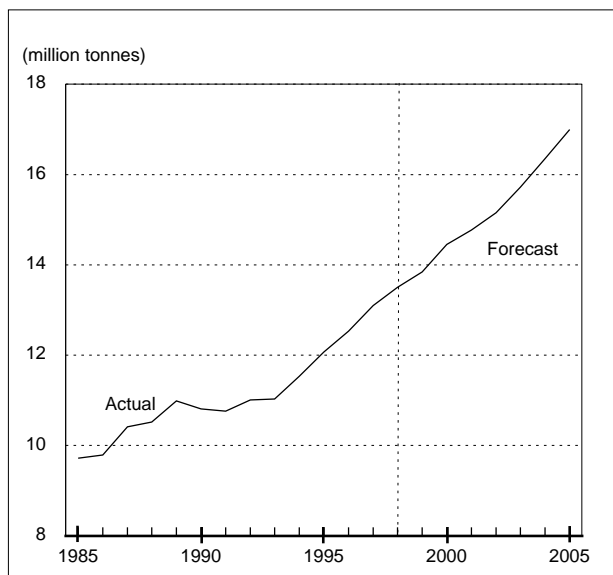
World refined copper consumption is expected to rise by 2.5% to 13.8 Mt in 1999 from 13.5 Mt in 1998. Higher-than-expected demand in Asia, particularly from South Korea and Taiwan, will offset the continuing contraction in Europe. Demand growth in the United States of 3.4%, while still positive, has slowed. World consumption is forecast to rise 4.4% in 2000 to 14.4 Mt on the strength of a recovery in demand in Europe and continuing steady growth in Asia and the United States. For the period 2001-05, copper consumption is expected to grow at an average annual rate of about 3.3%.

The largest increases in copper consumption will occur in the construction, transportation, and electrical and electronics industries. China and India are expected to account for a significant portion of this growth.

A number of promising new markets for copper could provide significant growth opportunities. These include certain roofing applications, 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

Figure 1
World Copper Consumption, 1985-2005



Source: Natural Resources Canada.

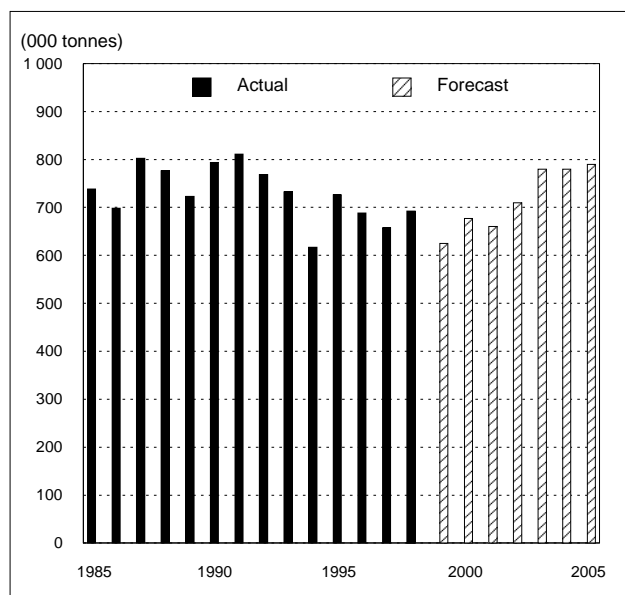
number of electrical circuits in automobiles could provide a significant boost for copper demand. In recent years, there has been a noticeable increase in the intensity of copper use in residential applications in North America. Part of this change is attributable to the construction of larger houses and the growth of home-based offices.

CANADIAN PRODUCTION OUTLOOK

Canadian copper mine production decreased in 1999 due to the temporary closure of the Highland Valley and Myra Falls mines in British Columbia and the permanent closure of the Gaspé mine in Quebec.

Mine output in 2000 is expected to recover to pre-1999 levels based on steady output from HBMS and full production at the Kemess, Myra Falls and Highland Valley mines. In the longer term, Canadian copper mine production should recover to annual output levels approaching 800 000 t. Possible new projects include the Wolverine prospect in the Yukon; the Red Chris, Prosperity and Tulsequah Chief projects in British Columbia; and the Voisey's Bay project in Labrador.

Figure 2
Canadian Mine Production of Copper, 1985-2005



Source: Natural Resources Canada.

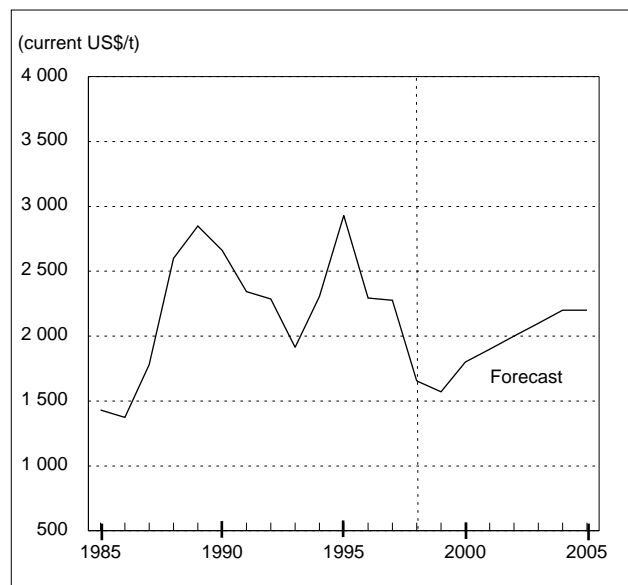
PRICE OUTLOOK

The combined effect of production cuts and growth in all of the major consuming regions should result in a more balanced metal market in 2000. A copper metal

surplus of between 250 000 and 300 000 t is forecast in 1999, while the metal balance is expected to range between +100 000 t and -100 000 t in 2000.

The recovery in copper prices that began in mid-1999 is forecast to continue into 2000; however, any significant increases above the US\$1900/t level (US86¢/lb) could trigger mine re-openings and producer forward hedge selling, thereby limiting upside potential. In 2000, copper is expected to trade within a range of US\$1750 and \$1850/t (US79¢ and 84¢/lb). For the period 2001-05, prices are expected to trade in a range between US\$1800 and \$2200/t (US\$0.82 and \$1.00/lb).

Figure 3
Copper Prices, 1985-2005
Annual LME Settlement



Source: Natural Resources Canada.

Note: Information in this article was current as of November 19, 1999.

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Magnesium

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1998 metal production: \$400 million^e
 World rank: Second
 Exports: \$249 million
 Imports: \$127 million

Canada	1996 ^e	1997 ^e	1998 ^e	1999 ^f
(tonnes)				
Production ¹	54 000	57 700	77 100	77 000
Consumption	27 600	34 000	32 600	33 000
Exports	40 853	49 135	51 305	52 000
Imports	22 733	34 976	32 311	35 000

^e Estimated; ^f Forecast.

¹ Canadian magnesium production data are confidential due to the limited number of companies reporting. This U.S. Geological Survey estimate, provided to the International Consultative Group on Nonferrous Metal Statistics, includes secondary magnesium.

Magnesium's main application is as an alloying agent for aluminum, which accounted for close to 43% of consumption in 1998. The next most important use for magnesium metal is for die-cast products. Increased interest in magnesium die-cast products by the automotive industry is largely due to weight savings of about 33% compared to aluminum. The third largest market for magnesium is as a deoxidizing and desulphurizing agent in the ferrous industry. Chemical applications include pharmaceutical products, perfumes and pyrotechnics.

ANNUAL AVERAGE PRICES, METALS WEEK (U.S. SPOT WESTERN MEAN)

1993	1994	1995	1996	1997	1998	1999 ^e
(US\$/lb)						
1.45	1.45	1.92	1.87	1.65	1.59	1.56

^e Estimated.

CANADIAN OVERVIEW

- Construction of Magnola Metallurgy Inc.'s 63 000-t/y magnesium metal plant at Danville, Quebec, is proceeding on schedule. Buildings and support structures are in place and the installation of mechanical and electrical equipment is progressing. The \$733 million plant is expected to start production in July 2000, creating 320 jobs. Further information on the project can be found on Magnola's web site at <http://www.magnola.com>.
- Norsk Hydro Canada's magnesium direct-chill casting unit was damaged in an explosion on January 19, 1999. The company announced in August that it would not rebuild the unit and that it had developed a new product to replace T-bar for use in alloying aluminum. Further information on Norsk Hydro can be obtained on its web site at <http://www.hydro.com/>.
- Cassiar Mines and Metals Inc., formerly Minroc Mines Inc., signed a Memorandum of Understanding with Aluminium of Korea Ltd. (Hyundai Group) for the development of its magnesium metal project in northern British Columbia. Aluminium of Korea may acquire an interest in the project. A US\$25 million feasibility study is expected to be completed in 2000. Further information on the project can be found on the company's web site at <http://www.minroc.com/press.htm>.

WORLD OVERVIEW

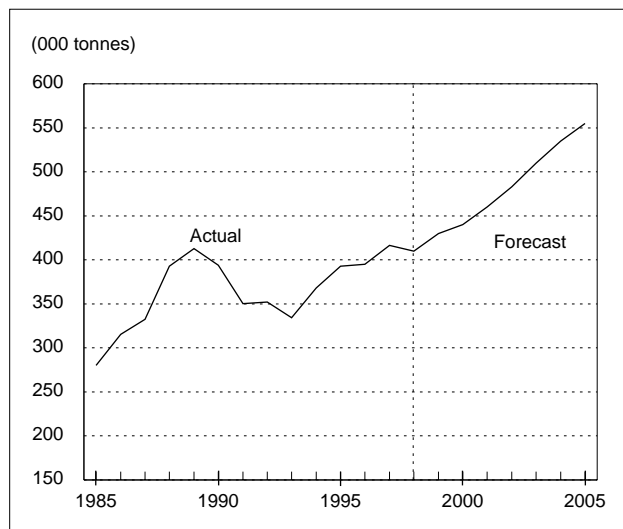
- Australian Magnesium Corporation reported on August 31, 1999, that it had produced its first batch of magnesium metal ingots in a pilot plant near Gladstone, Queensland. The company will complete a feasibility study in early 2000 for a 90 000-t/y metal plant. Additional information can be obtained at Normandy Mining's web site at <http://www.normandyusa.com/>.
- The European Commission has again started to review magnesium imports from China. For further information, refer to the following web site: <http://europa.eu.int>.
- Magnesium Alloy Corp. is working on a full feasibility study of its Kouilou project in the Republic of the Congo (Brazzaville). Russian National Aluminum and Magnesium Institute and Ukrainian Titanium Institute technology would be used to extract magnesium from salt deposits. The company is currently seeking a joint-venture partner. Additional information can be obtained on the internet at <http://www.magnesiumalloy.ca/>.
- Samag Ltd. has purchased technology and hired employees from Dow Chemical for its metal project in South Australia.

CONSUMPTION OUTLOOK

World primary magnesium consumption was 323 900 t in 1997, and is expected to increase to 375 000 t in 2000 and to over 500 000 t/y by 2005. Growth will result from demand for magnesium in aluminum alloys and die-cast automotive parts; however, growth will be dependent on prices and price stability as magnesium continues to face stiff competition from other materials, including aluminum, steel and plastics, in the all-important automotive parts sector. New applications and increased awareness of the advantages of magnesium in certain applications are growing, particularly in the North American automotive industry.

In Canada, reported consumption of magnesium decreased from 34 000 t in 1997 to 32 600 t in 1998. Small decreases in reported use in castings and alloys were responsible for this reduction. In the past, growth in Canada's demand for magnesium has come from increases in use in aluminum alloys and in castings and wrought products.

Figure 1
World Magnesium Consumption, 1985-2005



Source: Natural Resources Canada.

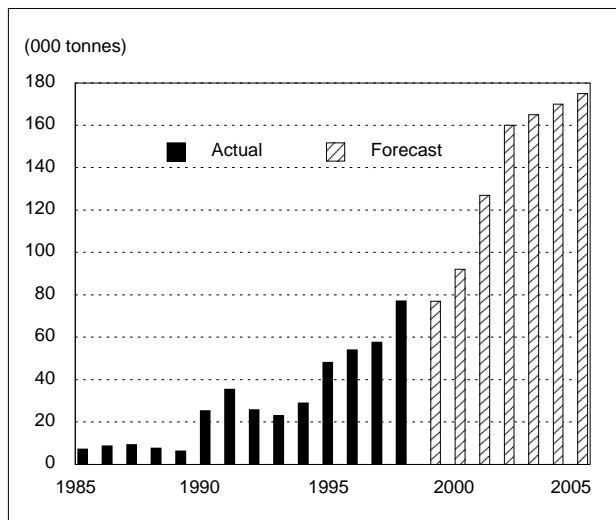
CANADIAN AND WORLD PRODUCTION OUTLOOK

Canadian primary magnesium production increased dramatically with the opening of Norsk Hydro's 40 000-t/y plant at Bécancour in 1990. Installed primary nameplate capacity has since remained stable, but it is set to rise again with the addition of Magnola Metallurgy's 63 000-t/y plant at Danville, Quebec, and the future expansion of Norsk Hydro's Bécancour plant. Once completed, Canadian primary magnesium production capacity will rise to about 150 000 t/y. Canada was the second largest producer of primary magnesium in the world in 1997 after the United States.

A number of proposed projects around the world could, if all constructed, significantly increase magnesium production to more than double today's production rate. Some of these projects have licensed existing technology from past and current producers and thus a significant production increase is possible.

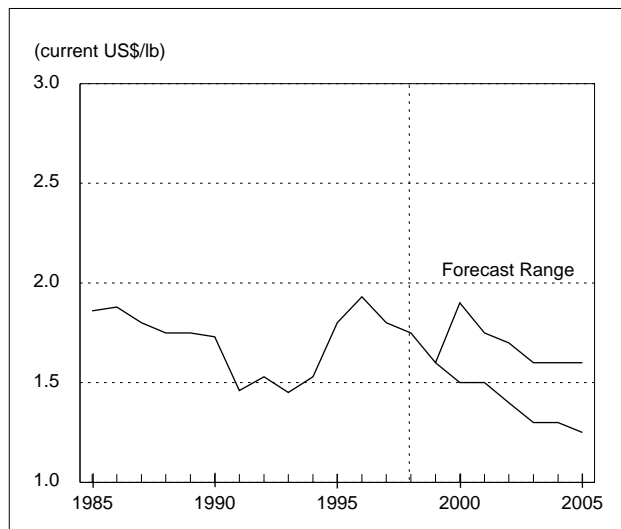
Even without any of these new project proposals, world primary magnesium production is expected to rise from an estimated 420 000 t in 1998 to 440 000 t in 2000 and to more than 500 000 t/y by 2005.

Figure 2
Canadian Magnesium Production, 1985-2005



Source: Natural Resources Canada.

Figure 3
Magnesium Prices, 1985-2005



Source: Natural Resources Canada.

PRICE OUTLOOK

The markets balanced lost production from Dow Chemical's Texas plant, which closed in 1998, with magnesium exports from China, sales from inventory, and capacity creep from existing plants. Prices published by *Metals Week* for magnesium remained relatively steady throughout the year. The U.S. Spot Western Mean remained at around US\$1.55/lb, while mean U.S. dealer import prices ranged between US\$1.30 and \$1.40/lb. Norsk Hydro's European producer price for pure magnesium started the year at 2.94 euros/kg. In October, Norsk Hydro cut this price to 2.61 euros/kg, or about US\$1.30/lb, from the 2.76 euros/kg price posted in August 1999.

A major factor that will influence magnesium prices in the longer term will be the change in supply over the next decade as the result of expansions/re-openings of existing capacity or the opening of new plants in Canada, the Middle East, Australia and China. The availability of newer, possibly lower-cost supply may eventually cause prices to decline. Prices are expected to remain in the \$1.30-\$1.60/lb range over the medium term.

Note: Information in this article was current as of November 19, 1999.

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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 Combinats. 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

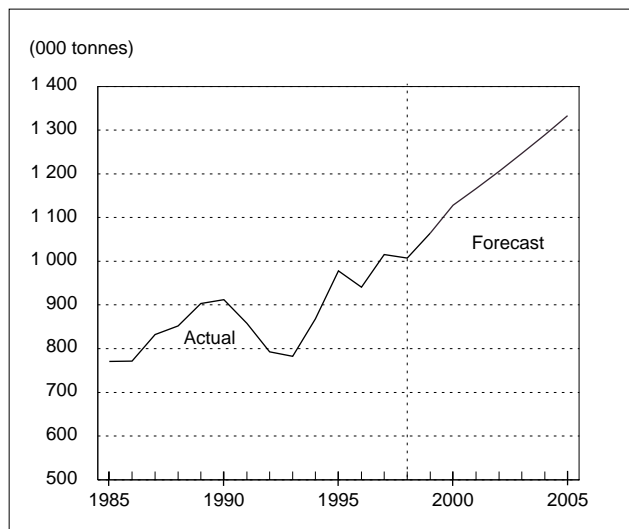
- In Australia, three new laterite projects – Bulong, Cawse and Murrin Murrin – had less success than forecast. Bulong produced commercial nickel in April. In December, the 9600-t/y plant is expected to operate at capacity. Cawse shipped its first nickel cathodes in February; the 9000-t/y operation was 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.

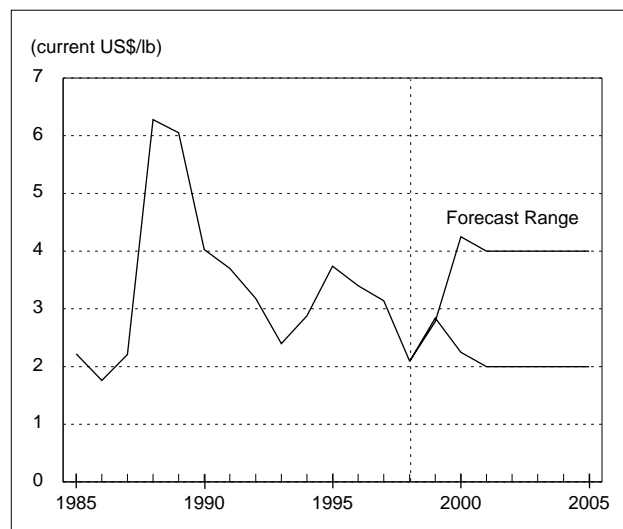
PRICE OUTLOOK

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.

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Zinc

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1998 mine production: \$1.5 billion
 World rank: Second (metal production)
 Exports: \$1.2 billion

Canada	1998	1999 ^e	2000 ^f
	(000 tonnes)		
Mine production	1 065	1 054	1 105
Metal production	743	774	784
Consumption	169	173	177

^e Estimated; ^f Forecast.

Zinc is used in the automotive and construction industries for the galvanization of steel and manufacture of die-cast alloys, in the production of brass, in semi-manufactures such as rolled zinc, and in chemical applications. Promising new applications for zinc are in the manufacture of zinc-air batteries and in galvanized steel studs as an alternative to wood in residential construction. Secondary zinc has become an increasingly important source of the metal in recent years. Secondary zinc includes high-purity refined zinc, remelted zinc of a purity less than 98.5% zinc, and zinc scrap used in the production of zinc alloys. Canada currently produces only a minor amount of secondary zinc exclusively from secondary feeds in primary zinc smelters. However, refined zinc from the processing of electric arc furnace dusts or from the de-zincing of galvanized steel scrap may become important in the future.

ANNUAL AVERAGE PRICES, LONDON METAL EXCHANGE FOR SPECIAL HIGH GRADE ZINC

1995	1996	1997	1998	1999 ^e
(US\$/t)				
1 038.8	1 025.0	1 313.3	1 023.3	1 100.0

^e Estimated.

CANADIAN OVERVIEW

- Work continued at Agnico Eagle's LaRonde zinc circuit, which came on stream at the end of September 1998. The company will spend US\$104 million to the end of 2002 to complete the expansion program at LaRonde, including mill expansion and shaft sinking. In June, the company announced its decision to expand the LaRonde mine by a further 39%. It is expected to produce 52 000 t/y of zinc in concentrate by 2000.
- Anglo American Plc is investing US\$240 million at its wholly owned Canadian zinc-copper subsidiary, Hudson Bay Mining and Smelting Co. (HBMS) at Flin Flon, Manitoba. The project includes a new shaft to develop the 777 deposit, which contains some 14.5 Mt of proven and probable reserves. The project is expected to extend the life of HBMS's Flin Flon operations to 2016.
- Cominco announced in June that it intends to process its existing 215 000 t of stockpiled lead smelter slag at Trail, British Columbia, by refurbishing and restarting its No. 2 slag fuming furnace before the end of 1999. The slag stockpile is estimated to contain 35 000 t of zinc.
- Noranda completed development of the \$113 million Bell Allard zinc-copper mine in the Matagami region of Quebec.

- Following a three-month suspension of operations, Boliden Limited restarted its Myra Falls mine located in Strathcona Provincial Park, British Columbia, in March.

WORLD OVERVIEW

- Korea Zinc Co. Ltd. announced plans to expand its lead-zinc refinery at Onsan. The company expects to increase zinc production capacity by 50 000 t to 400 000 t/y.
- In Australia, Korea Zinc Co. Ltd.'s new US\$425 million refinery in Queensland started production in October. At full production the refinery will have a capacity of 170 000 t/y of zinc.
- Rio Algom Limited, Noranda Inc., Teck Corporation and Mitsubishi Corporation announced the closing and first draw-down of funds from the US\$1320 million project financing for the Antamina copper-zinc project in Peru, and completion of the sale of 10% of Compañía Minera Antamina S.A. (CMA) to Mitsubishi. CMA is now owned 33.75% by each of Noranda and Rio Algom, 22.5% by Teck, and 10% by Mitsubishi.
- Pasminco Ltd. is expected to start shipments of zinc concentrates from its 780 000-t/y Century zinc mine in northwestern Queensland in December. Construction of the mine was completed in September, ahead of schedule and below cost.
- Ivernia West and joint-venture partner Minorco SA started producing ore in September from their Lisheen zinc mine in central Ireland. Lisheen is expected to produce up to 250 000 t of ore this year, with full production projected at 1.5 Mt/y yielding 330 000 t of zinc and 40 000 t of lead in concentrate.

LEADING WORLD ZINC PRODUCERS

Producers Zinc in Concentrate		Producers Zinc Metal	
	1998 ^e		1998 ^e
	(000 tonnes)		(000 tonnes)
China	1 280	China	1 500
Australia	1 158	Canada	774
Canada	1 054	Japan	635
Peru	910	South Korea	427
United States	810	Spain	378

Source: International Lead and Zinc Study Group.

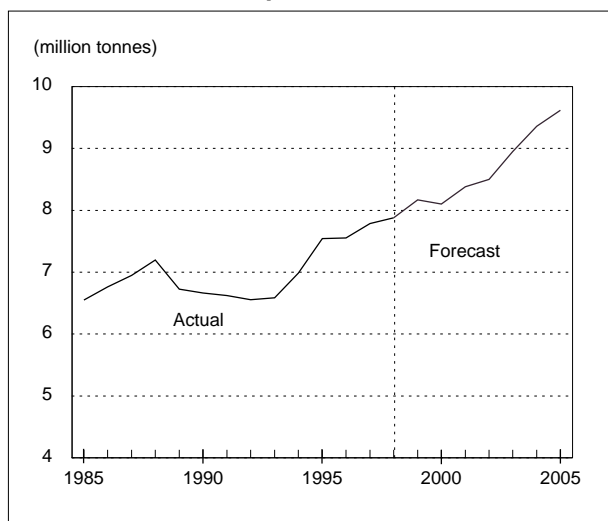
^e Estimated.

CONSUMPTION OUTLOOK

An increase of 2.6% in world zinc consumption in 2000 to 8.38 Mt is forecast, following an estimated 3.9% increase in 1999. Continued economic growth in North America should result in increased zinc demand of over 5.6% in 1999, with Europe expected to show more modest growth at just under 1%. In 2000, European demand is expected to rise by 2.7% and remain at 1999 levels for North America. The fall in demand in Japan is expected to stabilize in 1999 and a return to growth of 2% is forecast for 2000.

Beyond 2000, world zinc consumption is forecast to grow by an average 2.8%/y to 2005. Galvanizing will remain the dominant end use of zinc and exhibit the largest increase in consumption during the forecast period, followed by brass and die-cast alloys.

Figure 1
World Zinc Consumption, 1985-2005



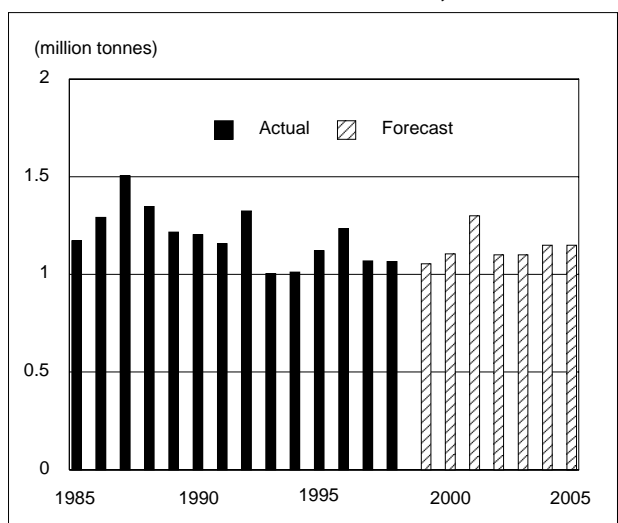
Source: Natural Resources Canada.

CANADIAN PRODUCTION OUTLOOK

Canada's mine production of zinc is expected to be 1% lower in 1999 compared to 1998. The closure of Anvil Ranges' Faro operations and Breakwater's Caribou and Restigouche mine in 1998, together with lower mine production at a number of other operations, including losses related to the temporary shut-down at Myra Falls, all contributed to the lower mine production figures in 1999. As the new circuit at Agnico Eagle's LaRonde mine continues to ramp up production, and mine production at several other operations increases, total mine production is expected to grow about 5% in 2000. Production is expected to remain at a level between 1.3 and 1.4 Mt/y to the year 2001.

Zinc metal production in Canada will increase about 4% in 1999 to 774 000 t, primarily as a result of the completion of the 20 000-t/y expansion projects at Cominco's Trail operations in British Columbia and at Noranda's Valleyfield zinc refinery in Quebec. In 2000, Canada is expected to produce 784 000 t of zinc metal.

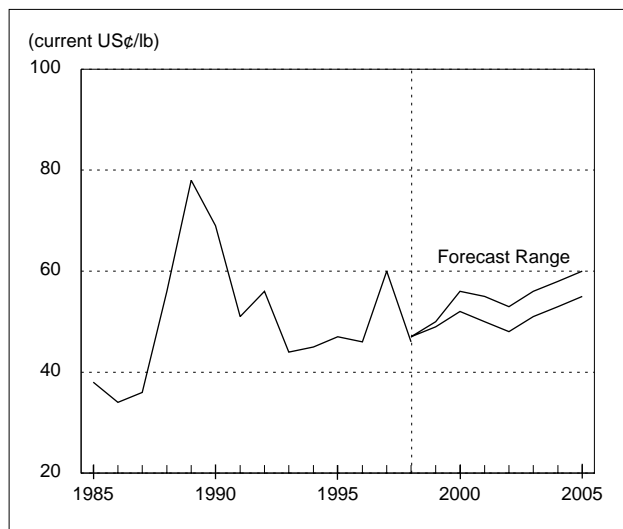
Figure 2
Canadian Mine Production of Zinc, 1985-2005



Source: Natural Resources Canada.

Beyond 2000, investments made in the zinc industry in recent years are expected to result in large increases in mine and smelter capacity near the turn of the century. Continued growth in galvanizing markets, combined with a gradual recovery in overall markets, is expected in the remainder of the forecast period with zinc prices rising to US\$1200-1300/t by 2005.

Figure 3
Zinc Prices, 1985-2005
Annual LME Settlement



Source: Natural Resources Canada.

PRICE OUTLOOK

The LME Cash Settlement prices for zinc maintained an upward trend through most of the first three quarters of 1999, peaking at US\$1226/t in September before falling back to the US\$1150/t range at the end of October, which is still some 20% higher than the US\$900/t range at the start of the year. Prices are expected to average about US\$1100/t in 1999. Higher prices reflected the strong demand and continued downward trend in stock levels. Stocks on the LME have fallen from a peak of 321 000 t in January to a low of 279 025 t at the end of October. This represents about 5.7 weeks of supply in the West, the lowest level since 1991.

For 2000, the zinc market is expected to remain fairly balanced with a slight deficit forecast overall. The market recovery in Japan and other South-East Asian nations, as well as continued growth in North America and Europe, is expected to strengthen prices, averaging about US\$1200/t (US55c/lb).

Note: Information in this article was current as of November 19, 1999.

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The Canadian and World Economic Situation and Outlook

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The Canadian economy has rebounded from the global financial crisis of 1997 and 1998. Commodity prices have generally turned around, responding to the ongoing strength of North American demand and improved prospects in Europe as well as in Japan and other Asian economies. Another major factor supporting the Canadian economy has been the sustained strength of the economy in the United States, which is by far Canada's largest trading partner. Stronger domestic demand, fueled by high levels of confidence, rising employment and relatively low interest rates, has also contributed to Canada's economic performance. It is the environment of low and stable inflation, in conjunction with the above factors, that provides the basis for the current and future strength of the Canadian economy.

Two factors that could destabilize the Canadian inflation picture require close attention and appropriate action if necessary. These factors are: 1) a prolonged, vigorous expansion of the U.S. economy, possibly leading to higher interest rates; and 2) the repercussions arising from the Canadian economy reaching the limit of its production capacity (although precisely where this level is is difficult to determine).

Canada's inflation rate has been low for several years now and that trend continued in 1999. For the first 11 months of the year, Canada's inflation rate (Consumer Price Index) averaged 1.7% above the comparable period in 1998. The rate in November 1999 was 2.2% above the November 1998 level. The core inflation rate, which excludes the food and energy components, has averaged 1.4% for the first 11 months of 1999 and in November was 1.6% above the November 1998 rate. These figures are all within the Bank of Canada's accepted target of between 1 and 3%. For 1999, the CPI is expected to average about 1.7%, rising to 2% or slightly more in 2000 as the Canadian economy continues to grow strongly.

In August 1998, the bank rate stood at 6%. Successive 25 basis point declines brought the rate to 4.75% in early November 1999. In response to a 25 basis point rise in the U.S. federal fund rate in mid-November, the Bank of Canada raised the bank rate to 5%, a 25 point increase. This was the first increase in the rate since August 1998. Because there has been little inflationary pressure and because the Canadian dollar has remained relatively stable, the Bank has been able to follow a relatively accommodative policy, thus enabling the Canadian economy to weather the downturn in commodity prices and allowed it to respond when the demand for commodities returned. With both the Canadian and U.S. economies now growing very strongly, and with only a modest slowdown expected next year, bank rates in Canada are expected to rise by perhaps 50 to 75 basis points by mid-2000. Given this scenario, rising commodity prices, a healthier current account balance, low inflation and a start on debt reduction, the Canadian dollar should strengthen modestly over the next couple of years, averaging about US70¢ in 2000 and over US71¢ in 2001.

In spite of heavy debt loads and a low savings rate, consumer expenditures are expected to increase in 1999 and 2000, encouraged by low interest rates and a significant increase in personal disposable incomes. In 1999, personal disposable income is forecast to rise about 3.2% and, in 2000, to rise by more than 4.5%. These increases are the result of continued job creation, moderately rising wages and reduced tax loads. Canada Mortgage and Housing Corporation (CMHC) anticipates that housing starts will reach 146 500 units in 1999 and 153 200 in 2000, up from the 137 400 recorded in 1998. Sales of existing homes should reach record levels, rising to 333 300 this year and 340 600 in 2000, compared to 314 300 in 1998. Automobile and truck sales are up 6.8% for the first 11 months of 1999 compared to the same period last year. Automobile sales in November were 17.7% above the November 1998 level, while truck sales were up 14.4%.

Manufacturers' shipments declined 0.7% in October to \$42.0 billion. October's decline, the first since March 1999, offset the 0.7% increase registered in September. Despite this decrease, the level of ship-

ments reached in October maintains the upward trend that began in the second half of 1998. Business and government investment in plant and equipment is expected to increase to record levels with spending of \$135.8 billion in 1999, up 8.1% over 1998. Data from the latest Statistics Canada survey show that investment plans (including housing) have been revised significantly for 1999, with an increase of \$9.2 billion over the \$165.1 billion that was originally planned. Steady profits, high capacity utilization rates (nearly 84% in the second quarter) and low interest rates are the underlying factors in this spending resurgence.

The level of both exports and imports increased in October. The merchandise trade surplus for October reached \$2.7 billion. The continuing recovery in commodity prices contributed to the rise in the value of merchandise trade, as did the demand from a strong U.S. economy and the relatively low value of the Canadian dollar. For the first ten months of 1999, the value of merchandise exports reached \$296.3 billion, 11.5% above the corresponding level in 1998. Imports increased more modestly, rising 7.7%, leaving a merchandise trade surplus for the January-October period of \$26.9 billion, compared to \$15.6 billion for the comparable period in 1998. The improved prospects for commodity markets and the competitive Canadian dollar have translated into a significant swing in Canada's current account suggesting that, by mid-2000, the account may be in a surplus position. (The sum of current account balances over time, which have often been deficits, is Canada's net external indebtedness.) This indebtedness has been a negative factor for Canada's financial markets in the past.

Employment increased strongly in November for the third consecutive month and brings job gains so far this year to 313 000, an increase of 2.1%. Unemployment fell in November and the unemployment rate dropped 0.3% to 6.9%, the lowest level since August 1981. This performance confirms that Canada is in the midst of its most evenly balanced growth period of the decade. Although employment growth is likely to continue, further declines in the unemployment rate will be limited by the continued expansion of the labour force because our participation rate is still well below levels attained before the last recession. So far this year, the unemployment rate has averaged 7.7% and should average about 7.6% for 1999. The sharp drop in the November unemployment rate makes predicting next year's rate more uncertain, but it is expected to decline to the low-to mid-7% range.

Canada and the United States will once again be the top performers of the G-7 countries in terms of real growth. For 1999, Canada's real growth (GDP) should average about 3.75%, slightly lower than the U.S. growth rate. In 2000, Canada's growth is

expected to slow somewhat to about 3% in response to a lower U.S. growth rate and moderately higher interest rates. However, the 3% growth rate would put Canada at the top of the G-7 countries next year.

The U.S. economy is turning in another stellar economic performance in 1999, characterized by low inflation and real growth of around 4%. Its GDP increased at an annual rate of 5.5% in the third quarter of 1999, up considerably from the 1.9% increase recorded in the second quarter. Although the U.S. economy created over 300 000 jobs in October, reducing the unemployment rate to 4.1% (the lowest level since early 1970), wage growth was subdued, as evidenced by the fact that hourly earnings increased by only 0.1% in October. Labour markets are exceedingly tight in the United States at the present time and there is no indication that the situation will change, a key risk to inflation according to the Federal Reserve.

U.S. consumers are expected to reduce spending in 2000 after recent years of consumer spending as the main driver of economic growth. Impressive gains in the stock market have allowed consumer spending to grow faster than anticipated. However, with a stock market correction expected within the next few months and with the Federal Reserve likely in the midst of moderate interest rate increases, consumer spending should slow. These interest rate increases, while not large, will have a significant effect as heavily indebted consumers will be very sensitive to even small rate increases.

The large U.S. trade deficit is expected to continue and will slow economic growth. Export growth should pick up as the global economy improves, but the strong U.S. currency will stimulate import growth even more. As a result, the U.S. current account deficit is expected to reach a record high \$440 billion by 2001.

Considering the above factors, U.S. real GDP growth should average about 4% in 1999 (the best in the G-7) and slow to about 2.5-3.0% in 2000.

Real GDP in Japan rose by a very strong 2% in the first quarter of 1999, after five consecutive quarters of decline. One half of this GDP increase came from public investment but, more importantly, private demand also contributed to the growth. Reduced public investment moderated the growth in the second quarter. However, there are still weaknesses and uncertainties surrounding the current economic situation. Household confidence is fragile due to falling incomes and job loss fears. Many businesses, especially those less exposed to international competition and pressures for restructuring, are still burdened by large debt loads and excess capacity. There is also a danger that public investment will continue to decline as the effects of earlier stimulus packages

wear off. Exports will benefit from the Asian recovery, but the strengthening of the yen in late 1998 and in 1999 is likely to limit growth from exports.

Despite these concerns, the International Monetary Fund (IMF) is forecasting a growth rate of 1% for Japan in 1999 and 1.5% in 2000, particularly if private sector confidence strengthens further. Monetary policy is very supportive of a recovery. Overnight interest rates are effectively zero and 10-year government bond yields are expected to hover around 2% this year and next. Further restructuring of the corporate sector, although already under way, is necessary. The unemployment rate is expected to increase from 4.1% in 1998 to 5% in 1999 and to 5.8% in 2000. Inflation will remain close to zero in both 1999 and 2000.

Other forecasters are less optimistic. With unemployment rising and incomes falling as restructuring continues, they expect the recovery to be hesitant and unlikely to surpass 1% this year or in 2000.

There is continuing evidence suggesting that the United Kingdom is recovering strongly from last year's manufacturing- and trade-induced slowdown. As a net oil exporter, the U.K. will benefit from higher oil prices. Even though the strength of the pound may hinder external trade, manufacturers are trimming costs to remain competitive and global demand is strong. Also, sharp declines in inventory point to the need to replenish stocks, which will further stimulate growth. Given these factors, real GDP growth in 1999 could approach 1.5% and rise to around 2.5% in 2000. After declining by 250 basis points since last October, the Bank of England raised short-term interest rates by 25 basis points in September to 5.25%, reflecting a shift in the Bank's concern from stimulating the economy to heading off inflationary pressures.

A strong economic recovery is also anticipated in the Euro-zone. Accommodative monetary policies are feeding through to interest-rate-sensitive sectors of the economy. Consumer, industrial and construction confidence have all risen. Driven by strong North American demand, strengthening demand in the Asian and East European regions, and accelerating growth in the U.K., export orders are on the rise. GDP is expected to rise by 2.1% in 1999 and by about 2.8% in 2000. Until needed labour market reforms are implemented, however, unemployment will remain high at over 10% in both 1999 and 2000.

The macroeconomic performance of the crisis-hit economies in Asia continues to improve. Positive GDP growth is expected in almost all the countries in 1999. Exports have increased, supported by favourable exchange rates and improved growth in regional trading partners. Recovering commodity prices and an upturn in the electronics sector have

also helped underpin the economy. Even stronger growth is forecast for 2000 in most countries as the recent improvements in economic confidence and activity are followed by a broader-based pickup in domestic demand. For Asia (excluding Japan, Hong Kong, Taiwan, South Korea and Singapore), the IMF is forecasting growth rates of 5.3% in 1999 and 5.4% in 2000. While financial restructuring is well advanced, corporate reforms must be implemented in order for the recovery to be sustainable.

South Korea is recovering at a very fast pace, supported by macroeconomic policies, an expansionary fiscal stance, low inflation and a competitive exchange rate. Growth is expected to reach 6.5% this year and 5.5% in 2000.

Recent developments in Latin America have been mixed. For the region as a whole, growth is forecast to be flat in 1999, but could rise to about 4% in 2000. Downside risks remain formidable, however, including policy challenges, a heavy political agenda, and the fragility of financial sentiment.

After some modest growth in 1997 and early 1998, economic activity in Russia again weakened in the wake of the 1998 financial crisis when Moscow defaulted on its foreign debts, sending the ruble into a tailspin. Continuing economic and political uncertainties have led to further capital flight and a decline in foreign direct investment. Some recent developments, however, suggest that the economic decline is being reversed. Industrial output has improved, partly as a result of import substitution related to the weakened ruble. Higher oil prices have also had a positive impact. Monetary policy has remained reasonably firm. As a result, inflation has slowed to around 3% per month or less, gross foreign reserves have increased, and the ruble has been generally stable since April 1999. Taking these factors into account, and assuming the implementation of effective stabilization and reform programs, the IMF has forecast zero growth for Russia in 1999 and 2% in 2000.

As a result of the Russian crisis, growth projections for many neighbouring countries have been downgraded, exchange rates have depreciated, inflation has increased, and fiscal positions have deteriorated. Growth in Hungary and Poland has, nevertheless, held up relatively well with growth for both expected to be 3.7% in 1999 and 4.5-5% in 2000. The Czech Republic economy is expected to be flat in 1999 following a 2.8% contraction in 1998. In 2000, the growth rate is forecast to be 1.5%. The core of the difficulties facing the Czech Republic, Slovakia and many of the other Eastern European countries is the poor financial condition of their banking systems and the slow pace of restructuring in some large industrial enterprises.

In summary, the world economy in general appears to be on the mend following the Asian crisis and subsequent financial turmoil in Brazil and Russia. Oil prices have recovered and declines in many other commodity prices have been arrested. The IMF is forecasting world growth rates to equal 3% in 1999 and 3.5% in 2000. However, uncertainty attached to the world economic outlook will prevail over the forecast period. If the U.S. economy weakens significantly without offsetting gains by Japan and Europe, there would be cause for concern related to the recoveries in the Asian economies and much of Latin America. Perceived or actual Y2K compliance problems are an additional risk. The achievement of a moderate slowdown in the United States, sustained recoveries in the emerging markets and in Japan, and a sustained strengthening in Europe are certainly feasible, but downside risks are present and if these risks occur, the generally positive global picture could change to less upbeat scenarios.

Note: Information in this article was current as of December 20, 1999.

Sources and acknowledgements: International Monetary Fund (IMF); TD Bank; Royal Bank of Canada; Bank of Canada; Canada Mortgage and Housing Corporation; Statistics Canada.

TABLE 1. CANADA, VALUE OF MINERALS AND MINERAL PRODUCTS (STAGES I TO IV), IMPORTS BY COMMODITY, 1997-99

	1997	1998	1999a
	(\$000)		
METALS			
Aluminum	3 827 343	4 360 507	2 899 028
Antimony	11 017	9 749	5 667
Barium	5 101	6 195	4 886
Beryllium	567	75	236
Bismuth	3 043	2 426	1 280
Cadmium	1 341	607	570
Calcium metals	40 576	47 562	31 803
Chromium	97 948	94 103	53 994
Cobalt	63 955	62 975	25 056
Copper	1 810 201	1 624 453	1 103 521
Gallium	22	31	10
Germanium	8 271	14 327	4 338
Gold	1 438 458	1 577 934	726 756
Hafnium	17	3	121
Indium	1 489	1 085	751
Iron and steel	12 912 369	15 378 002	9 946 721
Iron ore	357 847	387 945	245 313
Lead	551 199	596 903	348 772
Lithium	32 293	48 918	16 517
Magnesium and magnesium compounds	203 457	186 692	135 954
Manganese	167 566	209 580	133 444
Mercury	730	684	214
Mineral pigments	114 854	130 592	109 567
Molybdenum	40 489	41 009	23 806
Nickel	599 185	640 840	242 660
Niobium	20 968	25 358	20 357
Platinum group metals	228 667	182 448	118 081
Rare earth metals	9 628	8 365	4 257
Rhenium	9	26	12
Selenium	391	470	318
Silicon	90 978	96 550	53 986
Silver	142 383	136 916	71 720
Strontium	1 880	2 073	1 424
Tantalum	963	1 240	603
Tellurium	59	112	240
Thallium	1	10	18
Tin	59 240	61 768	47 366
Titanium metals	73 751	94 925	45 933
Tungsten	9 236	9 393	5 324
Uranium and thorium	219 999	223 733	182 634
Vanadium	44 830	62 730	14 248
Zinc	275 855	234 856	95 872
Zirconium	40 346	42 763	24 182
Other metals	7 741 696	9 277 780	6 557 810
Total metals	31 250 218	35 884 713	23 305 370
NONMETALS			
Abrasives	351 653	430 042	301 046
Arsenic	416	1 315	2 755
Asbestos	85 281	81 034	68 825
Barite and witherite	2 994	2 479	3 053
Boron	27 623	29 048	23 694
Bromine	2 225	1 637	1 211
Calcium (industrial minerals)	7 051	6 592	4 164
Chlorine and chlorine compounds	50 966	56 067	51 838
Diamonds	223 942	251 153	172 683
Feldspar	319	448	251
Fluorspar	42 530	49 460	24 970

TABLE 1 (cont'd)

	1997	1998	1999a
	(\$000)		
NONMETALS (cont'd)			
Glass and glassware products	1 865 834	2 143 384	1 590 530
Graphite	369 379	447 628	326 367
Gypsum	30 779	36 166	28 637
Iodine	18 775	16 670	9 131
Mica	12 369	11 469	7 994
Nepheline syenite	12	3	1
Nitrogen	137 482	165 129	82 004
Pearls	19 235	17 217	12 501
Peat	1 289	2 743	828
Perlite	10 604	13 215	10 444
Phosphate and phosphate compounds	422 311	477 501	278 968
Potash and potassium compounds	39 055	41 572	24 610
Salt and sodium compounds	318 140	308 609	220 390
Silica and silica compounds	125 737	143 149	123 053
Sulphur and sulphur compounds	19 096	21 940	13 934
Talc, soapstone and pyrophyllite	13 072	12 173	9 658
Titanium oxides	231 247	272 577	185 577
Vermiculite	5 491	6 504	5 572
Other nonmetals	520 977	552 857	397 823
Total nonmetals	4 955 884	5 599 781	3 982 512
STRUCTURAL MATERIALS			
Cement	188 201	210 444	137 763
Clay and clay products	762 951	861 141	569 619
Dolomite	1 462	1 127	877
Granite	35 642	51 447	37 029
Lime	6 380	5 752	5 015
Limestone flux and other limestone	18 107	20 401	12 484
Marble, travertine and other calcareous stones	39 433	49 886	34 803
Olivine	533	836	689
Sand and gravel	17 619	18 956	12 024
Sandstone	2 067	2 077	1 458
Slate	8 700	9 102	4 420
Other structural materials	66 709	77 660	54 330
Total structural materials	1 147 804	1 308 829	870 511
FUELS			
Coal and coke	879 158	1 141 503	672 971
Natural gas	137 292	104 003	51 233
Natural gas by-products	56 091	56 627	47 918
Petroleum	11 428 616	9 107 165	5 415 368
Other fuels	347 478	449 830	329 586
Total fuels	12 848 635	10 859 128	6 517 076
Total mining imports (including fuels)	50 202 541	53 652 451	34 675 469
Total economy imports	272 855 758	298 316 804	

Sources: Natural Resources Canada; Statistics Canada.
a First nine months of 1999.

Note: Numbers may not add to totals due to rounding.

**TABLE 2. CANADA, VALUE OF MINERALS AND MINERAL PRODUCTS
(STAGES I TO IV), EXPORTS BY COMMODITY, 1997-99**

	1997	1998	1999 ^a
	(\$000)		
METALS			
Aluminum	7 127 264	7 117 389	5 335 427
Antimony	875	1 403	345
Barium	184	—	14
Beryllium	—	—	67
Bismuth	1 415	2 015	1 449
Cadmium	5 612	3 205	2 542
Calcium metals	4 281	3 743	1 825
Chromium	33 642	31 939	23 146
Cobalt	431 471	472 106	220 246
Copper	2 929 108	2 432 249	1 454 899
Gallium	—	—	—
Germanium	450	1 401	1 994
Gold	3 485 710	3 384 921	2 138 579
Hafnium	—	—	—
Indium	—	—	—
Iron and steel	8 495 816	9 612 555	7 261 014
Iron ore	1 262 406	1 289 784	712 526
Lead	334 083	275 946	214 785
Lithium	—	159	69
Magnesium and magnesium compounds	252 921	273 404	181 054
Manganese	6 362	14 574	18 120
Mercury	170	17	26
Mineral pigments	69 910	72 002	56 249
Molybdenum	91 702	67 770	37 530
Nickel	2 119 890	1 927 452	1 198 613
Niobium	42 459	39 647	32 459
Platinum group metals	182 857	207 882	161 413
Rare earth metals	1 124	271	65
Rhenium	—	—	—
Selenium	5 324	4 607	2 029
Silicon	98 872	99 122	81 461
Silver	350 772	508 457	370 073
Strontium	5	8	—
Tantalum	79	1 067	316
Tellurium	3 097	1 178	2 571
Thallium	—	—	—
Tin	17 343	13 791	9 088
Titanium metals	16 678	17 134	14 640
Tungsten	684	635	699
Uranium and thorium	970 889	786 159	518 169
Vanadium	25 350	41 615	8 611
Zinc	1 789 170	1 552 139	1 188 820
Zirconium	3 047	3 258	3 162
Other metals	3 838 305	4 493 058	3 456 408
Total metals	33 999 327	34 754 062	24 710 502
NONMETALS			
Abrasives	208 748	226 760	173 104
Arsenic	33	—	—
Asbestos	308 350	264 272	199 227
Barite and witherite	5 907	9 158	4 836
Boron	498	393	214
Bromine	148	23	24
Calcium (industrial minerals)	33	83	301
Chlorine and chlorine compounds	149 584	143 079	75 866
Diamonds	13 660	6 869	11 280
Feldspar	29	23	30
Fluorspar	43 784	68 796	41 410

TABLE 2 (cont'd)

	1997	1998	1999 ^a
	(\$000)		
NONMETALS (cont'd)			
Glass and glassware products	972 070	1 007 983	867 451
Graphite	132 581	134 085	84 480
Gypsum	288 927	341 551	351 916
Iodine	10 683	12 525	5 597
Mica	9 240	11 289	10 324
Nepheline syenite	50 498	52 205	35 893
Nitrogen	981 713	912 217	753 784
Pearls	1 577	2 252	1 474
Peat	288 094	320 969	249 818
Perlite	–	–	–
Phosphate and phosphate compounds	26 169	27 866	23 284
Potash and potassium compounds	1 752 693	1 978 593	1 622 128
Salt and sodium compounds	503 537	542 886	372 862
Silica and silica compounds	18 370	16 923	16 630
Sulphur and sulphur compounds	468 190	356 130	168 862
Talc, soapstone and pyrophyllite	8 010	10 227	12 842
Titanium oxides	172 758	211 332	159 340
Vermiculite	–	–	–
Other nonmetals	446 985	397 213	276 378
Total nonmetals	6 862 869	7 055 696	5 519 355
STRUCTURAL MATERIALS			
Cement	573 844	627 716	543 225
Clay and clay products	44 475	39 821	35 023
Dolomite	11 978	15 533	21 831
Granite	65 010	67 879	56 906
Lime	27 203	21 300	10 235
Limestone flux and other limestone	25 612	32 825	18 967
Marble, travertine and other calcareous stones	21 205	32 681	28 980
Olivine	–	–	–
Sand and gravel	15 680	19 723	20 671
Sandstone	200	234	52
Slate	4 992	4 927	5 941
Other structural materials	57 682	97 892	74 364
Total structural materials	847 876	960 531	816 195
FUELS			
Coal and coke	2 734 570	2 504 909	1 612 605
Natural gas	8 625 631	8 987 512	7 299 419
Natural gas by-products	1 161 236	863 115	539 163
Petroleum	17 003 934	12 949 797	10 201 790
Other fuels	257 592	269 669	187 351
Total fuels	29 782 963	25 575 002	19 840 328
Total mining exports (including fuels)	71 493 035	68 345 291	50 886 381
Total economy exports	281 255 740	296 699 975	

Sources: Natural Resources Canada; Statistics Canada.

– Nil.

^a First nine months of 1999.

Note: Numbers may not add to totals due to rounding.