Magnesium

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2000 metal production: $365 million[e]
World rank: Third
Exports: $226 million

Canada	1999[e]	2000[e]	2001[f]
		(tonnes)	
Production[1]	80 000[r]	80 000	90 000
Exports	49 708	51 000	70 000

[e] Estimated; [f] Forecast; [r] Revised.
[1] Canadian magnesium production data have been confidential due to the limited number of companies reporting. This is a U.S. Geological Survey estimate, which includes recycled magnesium production provided to the International Consultative Group on Nonferrous Metals Statistics.

Magnesium's main application is as an alloying agent for aluminum, which accounted for close to 45% of magnesium shipments in 2000. 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 30% 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)

1997	1998	1999	2000	2001[e]
		(US$/lb)		
1.65	1.59	1.55	1.37	1.25

[e] Estimated.

CANADIAN OVERVIEW

- Magnola Metallurgy Inc.'s 58 000-t/y magnesium metal plant at Danville, Quebec, is complete and commissioning of the electrolytic cells is under way. Progress on solving start-up problems was well under way and the plant was operating 10 cells in July. The company planned to have 14 cells producing by the end of 2001. The plant was expected to produce 10 000 t of metal in 2001 and to reach full commercial production levels in early 2003. Further information can be found on the Noranda Magnesium web site at http://www.norandamagnesium.com.

- Primary production at Norsk Hydro Magnesium Division's Bécancour facility will be increased to 48 000 t/y in 2002 through debottlenecking. Future capacity increases in Bécancour will be evaluated based upon market needs and profitable returns. Hydro Magnesium does not expect any large-scale increases to be initiated in the short term. Further information is available on the Internet at http://www.magnesium.hydro.com.

- Canada's two largest magnesium producers have developed new magnesium alloys for use in higher temperature applications. With the continued

involvement of metal producers in alloy development, increased uses will be found for magnesium on a longer-term basis. Further information can be obtained from the Noranda Magnesium web site at http://www.norandamagnesium.com and from Hydro Magnesium's web site at http://www.magnesium.hydro.com.

- Globex Mining Enterprises Inc. hired Hatch Associates to complete a scoping study on Globex's magnesium-talc deposit located 13 km south of Timmins, Ontario. Previous work has indicated the potential for production of both magnesium metal and high-quality talc from the deposit. Results of the study were positive and indicated good economic potential, and the company is now reviewing the results in anticipation of conducting the recommended $12 million full bankable feasibility study. A mine-mill complex would be located near Timmins, Ontario, and a smelter complex would be located west of Rouyn-Noranda in Quebec. Globex Mining has an Internet site at http://www.globexmining.com.

WORLD OVERVIEW

- The major factor in magnesium markets remains the increased production and export of magnesium from China. Production and export levels in 2001 are expected to be similar to those in 2000. Pressure on markets from this production has resulted in a general decrease in the price of magnesium and has caused the United States and the European Union (EU) to impose high import duties on Chinese magnesium. The pressure on prices, combined with other factors, has caused several closures but has also helped stimulate growth in use.

- Norsk Hydro ASA has announced the closure of the 55 000-t/y Porsgrunn magnesium smelter in Norway. The existing casthouse will operate based on scrap and ingot remelt feedstock for magnesium alloy production. The Porsgrunn casthouse has a 20 000-t/y remelt capacity. Further information is available on the Internet at http://www.magnesium.hydro.com.

- Pechiney Électrométallurgie has announced the closure of the 18 000-t/y Marignac magnesium smelter in France. Pechiney has an Internet site at http://www.pechiney.com.

- Alcoa Inc. announced the October 2001 closure of the 38 000-t/y Northwest Alloys magnesium smelter in Addy, Washington. Alcoa has an Internet site at http://www.alcoa.com.

- Magnesium Corp. of America filed for protection from its creditors under Chapter 11 of the bankruptcy code. The company is modernizing equipment at its 43 000-t/y smelter in Rowley, Utah, after considerable pressure to clean up its site and reduce emissions. Modernization of the plant is expected to eventually increase its capacity but, in the near term, production will be significantly reduced.

- The U.S. International Trade Administration, after a review, determined that imports of pure magnesium from China were sold at less than market value and determined duty margins of 24.67% for Minmetals and 305.56% country wide. It also determined that sales of pure magnesium from Israel were made at less than fair value during the period of investigation and determined duty margins but, at the time of writing, appeared that it would not apply duties to the imports from Israel.

- Australian Magnesium Corporation (AMC), after some difficulty and government assistance of about A$300 million in the last year, completed financing for the construction of a 90 000-t/y plant at Stanwell, Queensland. Metal production is expected to start in late 2004 and to reach full capacity in 2006. For further information, see the company's web site at http://www.austmg.com and Australian government sites at http://www.minister.industry.gov.au and http://www.qld.gov.au.

- Work on other Australian projects continues. Mt. Grace received Major Project status from the Australian government for its metal project and Samag continued work on its Pima project. Further information is available on the Internet at http://www.mtgrace.com and http://www.pima.com.au, respectively.

- A number of Chinese magnesium producers agreed in October to limit the production of magnesium to avoid continued surpluses of material. By the time of writing, markets had not been noticeably affected.

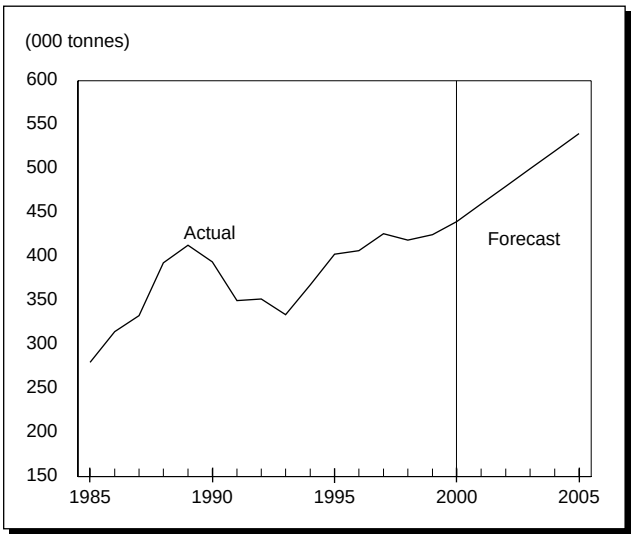
DEMAND OUTLOOK

Magnesium use is expected to increase to over 500 000 t/y by 2005. Growth will result from demand for magnesium in aluminum alloys and die-cast automotive parts, although the rate of growth will be dependent on the general economy, prices and price stability. 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 automotive industry.

In Canada, reported use of magnesium increased from a revised 43 850 t in 1999 to over 52 000 t in 2000, due in part to an increased number of

companies reporting. It should be noted that published figures on use may include run-around scrap and work is nearing completion on a revised survey for 2001 data.

Figure 1
World Magnesium Use, 1985-2005



Sources: Natural Resources Canada; International Consultative Group on Nonferrous Metal Statistics.

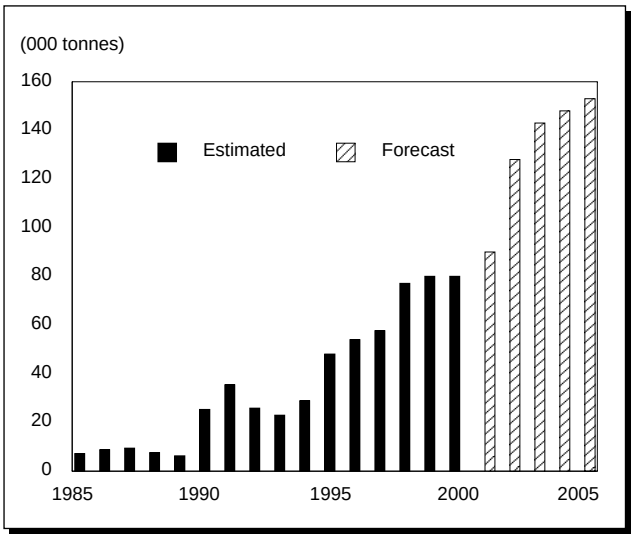
CANADIAN AND WORLD PRODUCTION OUTLOOK[1]

In 2001, Canada was the third largest producer of primary magnesium in the world after China and the United States; however, in 2002, with the closures in the United States and the ramping up of Magnola Metallurgy, Canada is expected to become the second largest producer.

Canadian primary magnesium production increased dramatically with the opening of Hydro Magnesium's 40 000-t/y primary magnesium plant at Bécancour in 1990. Installed Canadian primary nameplate capacity has since remained stable, but is now set to increase due to the start-up of Magnola Metallurgy's 58 000-t/y plant at Danville, Quebec, and a debottlenecking of Hydro Magnesium's Bécancour plant. Canadian primary magnesium production is expected to rise to approximately 80 000 t/y in 2002.

A number of projects around the world, primarily focused in Australia, could, if all constructed, significantly increase magnesium production to more than double today's production rate. World primary magnesium production is expected to rise from an estimated 460 000 t in 2000 to more than 550 000 t/y by 2006 and higher if many new producers achieve their goals.

Figure 2
Canadian Magnesium Production, 1985-2005



Sources: Natural Resources Canada; International Consultative Group on Nonferrous Metal Statistics.
Notes: Canadian production data are confidential due to the limited number of producers. This is estimated production and includes recycled material.

PRICE OUTLOOK

Prices for primary magnesium remained relatively weak for most of the year as markets and governments continued to react to increased production and magnesium exports from China. Prices as published by *Metals Week* for magnesium again trended downward through the year. The U.S. Spot Western Mean price started the year at around US$1.26/lb, decreasing to below $1.25/lb late in the year, while mean U.S. dealer import prices decreased from US$1.08/lb to $1.06/lb. Hydro Magnesium's European producer price for pure magnesium started the year at 2.33/kg but, after declining to 2.22/kg in January, rose to 2.42/kg in July. Late in 2001, prices for magnesium produced in China were reported to be in the range of US$1200-$1300/t, f.o.b. China.

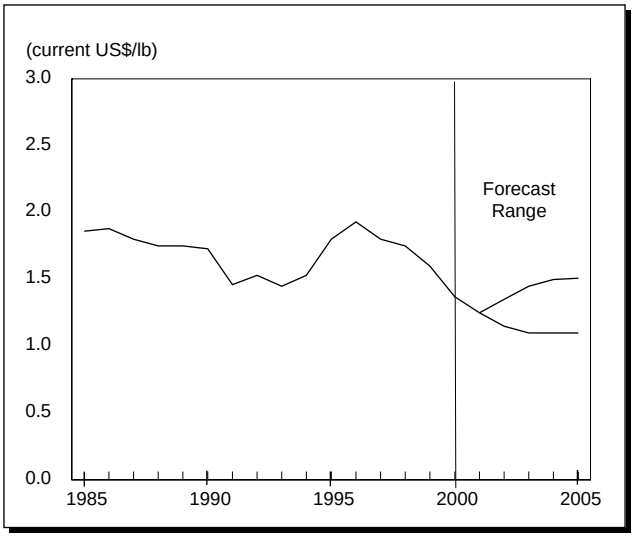
A major influence on magnesium prices will be the changes in supply over the next decade as the result of closures, expansions, the re-opening of existing capacity, or the opening of new plants in China, Canada, Russia, the Middle East and Australia.

[1] It should be noted that magnesium statistics vary between sources.

Another major factor will be the economy of the world and its impact on automotive use of the metal in more magnesium-intensive applications along with the imposed duties in the U.S. and EU markets. The availability of newer, possibly lower-cost, supply may eventually cause prices to decline. Prices are expected to remain historically weak, likely in the bottom part of a US$1.10-$1.50/lb range, over the medium term until use catches up with production rates and stockpiles.

Note: Information in this article was current as of November 1, 2001.

Figure 3
Magnesium Prices, 1985-2005



Source: *Metals Week* (U.S. Spot Western Mean).

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