

# General Review

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## **OVERVIEW**

**G**lobal economic demand slowed considerably in 2001, notably in the United States, resulting in a build-up of inventories and a decline in manufacturing activity. Business investment was weak and the strong consumer spending that had driven many of the world's economies over the past several years began to soften during the year. The results were felt by the mineral industry where depressed demand for most mineral commodities sent prices tumbling in 2001, particularly for the major metals.

Canada's real Gross Domestic Product (GDP), measured at market value in 1997 prices, increased by 1.5% in 2001 to \$1024.2 billion, compared to growth of 4.5% in 2000. Both interest rates and inflation remained low in 2001 aided by nine Bank of Canada interest rate cuts. The average annual unemployment rate rose to 7.2% from 6.8% in 2000 and the value of the Canadian dollar in terms of the United States dollar averaged \$0.646, down from \$0.673 for 2000. Total Canadian exports (Customs basis) decreased to \$402.3 billion, down 2.6% from \$412.9 billion in 2000, but still significantly higher than the \$355.1 billion recorded in 1999. Imports (Customs basis) totaled \$343.0 billion, compared to \$356.9 billion in 2000 and \$320.4 billion in 1999.

Preliminary estimates for the value of production<sup>1</sup> for all sectors of the Canadian mining and fuel extraction

industry reached \$83.8 billion in 2001, nearly matching the record high of \$83.9 billion in 2000. This strong showing was due to continuing strong performance in the fuels sector, particularly by natural gas. When fuels are excluded, the value of production for the mining industry (Canadian-based mines) declined by 3.4% to \$17.8 billion. Metal production decreased by 6.8% to \$10.2 billion while nonmetal production, including structural materials, increased by 1.7% to \$7.6 billion.

The value of total exports for non-fuel mining and mineral processing products (including coal) fell to \$48.7 billion, a 4.2% decline from \$50.8 billion in 2000. The 2001 export figure represented 12.1% of Canada's total exports. Canadian imports of non-fuel mining and mineral processing products (including coal) declined to \$46.6 billion, a 9.0% drop from \$51.2 billion in 2000. As a result, the balance of trade (total exports minus imports) showed a surplus of \$2.1 billion in 2001, replacing the small deficit that had occurred in the previous year.

Prices of most of the major metal commodities fell during the year from highs reached at the beginning of 2001. Of the major nonferrous metals, only lead and uranium prices were slightly higher at year-end as prices for nickel, copper, zinc and aluminum were all down from a year earlier. For precious metals, gold was up slightly for the year and silver was down narrowly, whereas palladium and platinum prices fell sharply during the year.

Corporate operating profits in the Canadian mining industry (excluding coal) were \$2.3 billion in 2001, down 25.4% from \$3.1 billion in 2000.

Significant developments affecting the Canadian non-fuel mineral industry in 2001 included:

- a deteriorating financial performance by Canadian mineral and metal producers due in large part to weakening global economic conditions and low commodity prices;
- generally sluggish activity in mineral exploration and mine development, although strong exploration and development activity in Canada's diamond industry continued;

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<sup>1</sup> Throughout this article, the volume and value of production data are based on estimates using shipments as the measure of mine production, as published in Canada's Mineral Production, Preliminary Estimates, Statistics Canada, cat. no. 26-202-X1B.

- more mine closings than openings, including the closing of the long-operating Sullivan mine in British Columbia; and
- decreased employment in mining.

The outlook for the Canadian mineral industry in 2002 is hopeful. In late 2001, there were signs of improving economic demand conditions and of an end to metals inventory reductions on a global basis. As well, cutbacks in mine production and processing capacity that had taken place, or are scheduled in 2002, will have a positive effect on overall supply/demand market dynamics. These factors should lead to higher prices and better health for the global mineral industry, including Canadian companies.

## THE CANADIAN ECONOMY

Growth in the Canadian economy slowed noticeably in 2001 as GDP grew by only 1.5%, down from 4.5% in 2000 and 5.1% in 1999. Indeed, there was negative growth in the third quarter of the year, compared to the second quarter, a reflection, to some degree, of the negative repercussions on economic activity resulting from the September 11 terrorist attacks in the United States. This was particularly noticeable in the transportation, hospitality and tourism sectors.

In response to the economic slowdown that was evident early in the year, the Bank of Canada lowered its bank rate nine times during the year. From a rate of 5.75% at the beginning of the year, decreases ranging from 25 to 75 basis points were made between late January and late November, resulting in an end-of-year rate of 2.50%. The annual inflation rate (Consumer Price Index) remained within the Bank of Canada's annual target range of 1-3%, averaging 2.6% in 2001, down from 2.7% in 2000. In 1999 the rate was 1.7%. The value of the Canadian dollar in terms of the U.S. dollar averaged \$0.646, down from \$0.673 for 2000. This represents a 4.1% decline and continues the trend of the 1990s when the dollar lost nearly one third of its value. The average annual unemployment rate rose to 7.2% from 6.8% in 2000.

Even with the slowdown in economic activity in 2001, consumer spending was robust. Canada Mortgage and Housing Corporation announced that new housing starts increased by 7.3% to 162 733 units in 2001 as home buyers took advantage of significantly lower mortgage interest rates. Similarly, the Canadian Real Estate Association reported that existing house sales across Canada on the Multiple Listing Service increased by 14% from 333 822 in 2000 to 380 458 in 2001, an all-time high. (The previous high was 335 490 in 1999.)

Statistics Canada announced that new motor vehicles sales rose to a record 1.6 million units in 2001, an increase of 0.6% over 2000. This was due in part to strong sales in the fourth quarter as companies offered strong buying incentives, including zero interest financing, to maintain sales levels following September 11<sup>th</sup>. Of this total, passenger car sales rose 2.4% to 869 000. On the production side, automotive manufacturers in Canada produced 2.4 million vehicles in 2001 (1.3 million passenger cars and 1.1 million vans and trucks), down 11.0% from 2000.

### CANADIAN ECONOMIC CONDITIONS

Leading Indicators	2000	2001	% Change
Real GDP (\$ billions, 1997 prices)	929.6	940.0	1.1
Consumer prices (% annual change)	2.7	2.6	n.a.
Operating profits (\$ millions)	197.7	156.8	-20.7
Unemployment rate (% annual average)	6.8	7.2	7.3
Merchandise trade balance (balance of payments basis) (\$ billions)	59.3	62.6	n.a.
Housing starts (000)	151.7	162.7	7.3
U.S. exchange rate (annual average)	0.6733	0.6458	-4.08
International current account balance (\$ millions)	26 894	29 100	n.a.
Global economic output (% change)	+4.7	+2.5	n.a.

Sources: Statistics Canada; Canada Mortgage and Housing Corporation; Bank of Canada; International Monetary Fund. n.a. Not applicable.

Based on annual averages, employment in Canada rose by 167 100, or 1.1%, in 2001, down from 378 500 in 2000, a 2.6% growth rate over 1999. The average unemployment rate for 2001 was 7.2% although, in the last quarter of 2001, the rate reached 7.7%.

On the trade front, total Canadian merchandise exports fell to \$402.3 billion from \$412.9 billion in 2000, a decline of 2.6%. However, the trade surplus (total exports minus imports) rose to \$59.3 billion, an increase of 5.9% over the \$56.0 billion trade surplus experienced in 2000. Imports totaled \$343.0 billion in 2001 compared to \$356.9 billion in 2000.

Global economic activity (as measured by GDP) increased in 2001 by 2.5%, down sharply from 4.7% in 2000 and 3.6% in 1999. The U.S. economy fell from 4.1% in 2000 to 1.2% in 2001. Western Europe declined from a 3.3% growth rate in 2000 to 1.6% in 2001, with Germany falling from 3.2% to 0.7% and

the United Kingdom falling from 3.0% to 2.4%. Japan fell from a 2.2% growth rate in 2000 to -0.4% in 2001. China declined only slightly from 8.0% in 2000 to 7.3% in 2001. Growth in South America declined to 1.3% from 4.3% in 2000.

## THE CANADIAN MINERAL INDUSTRY

The Canadian mineral industry can be characterized by the following four stages of processing activity:

- Stage 1: Mineral extraction and concentrating industry (for example, gold mining, quarries and sand pits);
- Stage 2: Smelting and refining industry (for example, nonferrous smelting and refining, alloying, and the production of primary steel);
- Stage 3: Nonmetals and metals-based semi-fabricating industries (for example, copper rolling, casting and extruding, and concrete products); and
- Stage 4: Metals fabricating industries (for example, manufacturing of ornamental metal products and machine parts).

While much of the emphasis of this article focuses on Stage 1 activities (the activities of the mining industry), a description of the mineral industry as a whole (Stages 1 to 4) provides a more comprehensive picture of its importance to Canada. In the context of this article, the mineral industry should be taken to

exclude the extraction and processing of crude petroleum and natural gas, but to include both the coal and uranium mining industries.

## GDP OF THE MINERAL INDUSTRY

In 2001, the mineral industry, as defined above, contributed \$35.1 billion, or 3.7% of Canada's total GDP of \$940.0 billion, a decrease of 0.8% from 2000.<sup>2</sup> Mining (mineral extraction and concentrating – Stage 1) contributed 25.0% of the industry's GDP in 2001 while smelting and refining (Stage 2) added a further 21.1% to the total. Nonmetals and metals-based semi-fabricating (Stage 3) accounted for 22.3% and metals fabricating (Stage 4) accounted for the remainder at 31.6%.

For mining (or Stage 1) in 2001, GDP increased by 0.8% to \$8.8 billion as coal mining increased by 3.6% to \$1.1 billion and metal mining increased by 1.0% to \$5.0 billion, while nonmetals, including structural materials, declined by 0.5% to \$2.7 billion. GDP for support activities related to mining and oil and gas (not included in the stage totals given) rose by an estimated 5.5% to \$5.3 billion in 2001.

Because these figures are based on 1997 prices, an increase in the value of GDP indicates an increase in the volume of goods and services produced. These proportions can be misleading, however, in that they are based on 1997 prices and thus may not reflect commodity prices as they were in 2001.

### CANADIAN MINERAL INDUSTRY

Leading Mining Indicators	2000	2001	% Change
Value of non-fuel mineral production (\$ millions)	19 842	19 345	-2.51
Exploration expenditures (\$ millions)	496.7	491.3	-1.1
Metal Price Index (1997=100)			
Precious metals	87.9	83.3	
Base metals	94.4	73.8	
Direct mining employment (000)	51.4	46.4	-9.8
Value of minerals and mineral products domestic exports (\$ billions)	49.5	47.4	-4.3
Mining company operating profits (\$ billions)	3.1	2.3	-25.5
Mine financing (\$ billions) (Gamah International, April 2002)	6.2	5.1	-18.1

Sources: Natural Resources Canada; Statistics Canada; Gamah International.

Note: All the indicators above, with the exception of the Metal Price Index and mining company operating profits, include the coal mining industry.

## CANADIAN MINERAL PRODUCTION

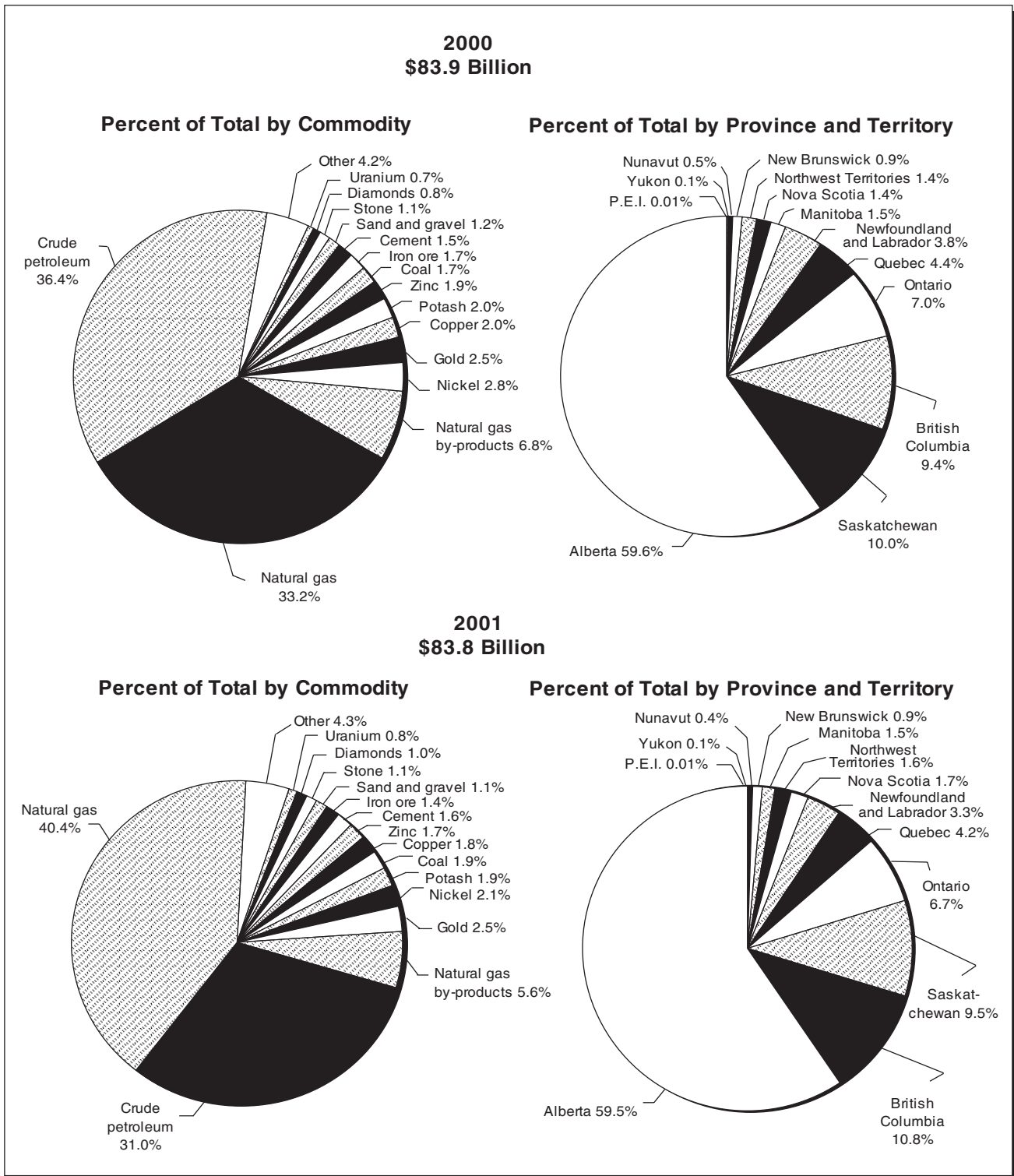
### Production from Canadian Mines, Quarries and Oil/Gas Wells

Based on preliminary estimates and using shipments as the measure of mine production, the total value of Canadian mineral production (including fuels) amounted to \$83.8 billion, just fractionally off the record high of \$83.9 billion set in 2000. The continuing high level of the value of mineral production was due to another strong performance by the fuels sector, up 0.8% to \$66.0 billion. Non-fuels (metals and nonmetals) declined in value by 3.4% to \$17.8 billion, with a sharp fall in metals value more than offsetting a modest increase in the value of nonmetals.

The value of metals production fell by 6.8% to \$10.2 billion in 2001 from \$11.0 billion in 2000 as significant decreases occurred in the values for nickel, copper, zinc, iron ore and cobalt. Gold was the only

<sup>2</sup> In this section, all figures are based on GDP at basic prices and at 1997 prices.

**Figure 1**  
**Value of Mineral Production, Percent Shares by Commodity and by Province and Territory,**  
**2000 and 2001**



Sources: Natural Resources Canada; Statistics Canada.

Note: The provincial/territorial shares may not add to 100% due to rounding.

metal produced in Canada that had a value of production over \$2 billion in 2001. It was Canada's leading metal with a value of \$2.1 billion, an increase of 2.9% and a reflection of an increase in gold output of 2.2%.

Nickel production rose by 1.4%. However, substantially lower prices led to a fall in its value of 24.1% to \$1.8 billion. Copper production was only 1.7% lower in 2001, but lower prices resulted in a value drop of 9.7% to \$1.5 billion. The value of zinc production was off by 9.6% to \$1.4 billion, again due to much lower prices as output was ahead by 7.9%. Iron ore production fell by 23.5%, reflecting lower steel demand in North America. As a result, the value of iron ore production fell 18.9% to \$1.2 billion. Lower prices for cobalt led to a fall of 22.1% in the total production value of \$78.2 million, even though production volumes were up by 1.3%.

#### **VALUE OF CANADIAN MINERAL PRODUCTION<sup>(1)</sup>**

	2000 (r)	2001 (p)	Change
	(\$ millions)		(%)
Metallic minerals	10 988.9	10 245.4	-6.8
Nonmetallic minerals	7 425.7	7 552.3	1.7
Total non-fuels	18 414.7	17 797.7	-3.4
Fuels	65 439.3	65 984.7	0.8
Total minerals	83 854.0	83 782.4	-0.1

Sources: Natural Resources Canada; Statistics Canada, *Canada's Mineral Production, Preliminary Estimates*, 2001, cat. no. 26-202-XIB.

(p) Preliminary; (r) Revised.

(1) The value of non-fuels production is based on shipments.

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

Among the value of other metals, shipments of uranium increased by 42.8% to \$675.6 million (production up by 31.0%), platinum group metals were up by 18.9% to \$568.8 million (production up by 18.6%), and silver declined by 4.0% to \$267.9 million (production up by 4.7%). The value of lead increased by 12.2% to \$108.3 million (production up by 4.3%) and molybdenum rose by 22.8% to \$77.1 million (production up by 22.3%). Mine production of uranium was up almost 25% to about \$600 million.

The value of nonmetal production (including structural materials) rose to \$7.6 billion in 2001, an increase of 1.7% over 2000. Increases in the value of cement, diamonds, salt and clay products more than offset declines in many of the other leading nonmetals, such as potash, sand and gravel, and lime. Potash decreased in value by 3.8% to \$1.6 billion with

a production fall of 9.4%. Nevertheless, potash remained the leading nonmetal produced in Canada and was the only one with a production value greater than \$1.5 billion in 2001.

The value of cement rose to \$1.3 billion, an increase of 4.3%, as production was up by 3.0%, while the value of sand and gravel declined by 1.9% to \$953.2 million (production down by 5.4%). The value of diamond production was up by 35.5% to \$846.9 million as the total number of carats produced increased by 51.3%. The value of salt shipments increased by 27.9% to \$449.5 million as production volumes were up by 11.4%.

Among the other nonmetals, the value of lime fell by 10.6% to \$212.4 million (production fell by 12.0%), clay products rose by 11.3% to \$195.2 million, asbestos fell by 6.7% to \$132.2 million (production down by 5.2%), and gypsum fell by 8.7% to \$96.4 million (production down by 5.3%).

The value of production for mineral fuels rose by just 0.8% in 2001 to \$66.0 billion, an all-time record high. An increase of 21.5% in the value of natural gas to \$33.8 billion (production up by 2.5%) and an increase of 8.4% in coal value to \$1.5 billion (production up by 1.7%) fractionally offset the declines of crude oil and natural gas by-products. The value of crude oil production fell by 15.0% to \$25.9 billion (although there was an increase in production of 2.1%) and natural gas by-products fell by 17.3% to \$4.7 billion (a decline in production of 2.5%).

Based on the value of production for 2001, the top non-fuel commodities were gold (\$2.1 billion), nickel (\$1.8 billion), potash (\$1.6 billion), copper (\$1.5 billion), zinc (\$1.4 billion), cement (\$1.3 billion), iron ore (\$1.2 billion), and sand and gravel (\$953.2 million). In terms of the levels of production of Canada's leading minerals, increases in output of 5% or greater were recorded for diamonds, uranium, molybdenum, platinum group metals, salt and zinc, whereas declines of 5% or more were experienced by iron ore, lime, peat, sand and gravel, gypsum, and asbestos.

The industry may be more important on a regional and community basis as, in many parts of Canada, particularly in the North, it provides a major economic stimulus. Over 100 communities were heavily reliant on the mineral industry in 2000 and approximately 600 000 Canadians lived in these communities.

Regionally, four provinces continued to dominate the value of Canada's non-fuel mineral output in 2001, accounting for 74.3% of the total. Ontario contributed the largest share of the non-fuel mineral output with 30.9% of the total value while Quebec contributed 19.6%, Saskatchewan contributed 12.9% and British Columbia contributed 10.8%. Among the

remaining provinces and territories, the Northwest Territories and Manitoba each accounted for 5.1%, Newfoundland and Labrador for 4.7%, New Brunswick for 4.3%, Alberta for 3.1%, Nunavut for 1.8%, Nova Scotia for 1.3%, and the Yukon for 0.2%. The value for Ontario decreased by 3.6% to \$5.5 billion, Quebec was down by 4.4% to \$3.5 billion, Saskatchewan was up by 7.2% to \$2.3 billion, and British Columbia was down by 7.3% to \$1.9 billion. When coal is included, the value of Saskatchewan's production rises to \$2.4 billion, up by 7.2% from 2000, and the value of British Columbia's production increases to \$2.9 billion, a decrease of 0.7% compared to 2000.

Alberta is Canada's major fuels producer with a value of production of \$49.3 billion, or 74.7% of Canada's total in 2001. Alberta produces a full complement of mineral fuels: crude petroleum, natural gas, natural gas by-products and coal. Other provinces with significant mineral fuel production are British Columbia with 10.8% and Saskatchewan with 8.6%, respectively, of Canada's total. Newfoundland and Labrador, growing in relative importance, accounted for 3.0% and the other provinces and territories accounted for the remaining 3.0%.

There were only 2 mine openings in 2001, while 14 mines closed (8 were suspensions and 6 were permanent closures). One opening was in Newfoundland and Labrador and the other was in British Columbia. Three of the closures were in Quebec, three were in British Columbia, and two were in Ontario. There was one each in Newfoundland and Labrador, Nova Scotia, New Brunswick, Manitoba, Saskatchewan, and the Yukon. One of the permanent closures was Teck Cominco Limited's Sullivan mine. This mine, located in Kimberley, British Columbia, closed in late 2001 due to ore depletion 92 years after going into commercial production in 1909. The mine was founded on an orebody discovered in 1892 and became one of the world's largest lead-zinc-silver mines and Canada's longest-running mining operation.

### Mineral and Metal Production from Recycled and Imported Materials

Annual statistical series of Canada's mineral production have to date only included the production and value of minerals and metals obtained from Canadian-mined ores and concentrates. Statistics on the production and value of recycled materials or minerals and metals produced from imported ores, concentrates, and recycled minerals and metals have not been generally available, despite the fact that Canada is a major producer of metals, most notably aluminum, from imported ores. Work has started on the development of new statistical series to present information that will characterize the production of these materials in Canada.

## MINERAL AND METAL COMMODITY PRICES

The weakness in mineral and metal commodity prices that was evident in the latter stages of 2000 continued into 2001 as global economic conditions worsened sharply in almost all countries with the notable exception of China. Indeed, GDP for the world economy is estimated to have increased by only 2.5% in 2001, down from 4.7% in 2000.

Prices for most major metals, including nickel, copper, aluminum and zinc, finished 2001 at levels lower than they started the year. Only lead and uranium ended 2001 with higher price levels than at the beginning. Across the world, these lower commodity prices led to mine closures. However, even with lower prices, many higher-cost producers continued to operate due in large part to local currencies that were relatively weak compared to the U.S. dollar.

Based on trading on the London Metal Exchange (daily closings), nickel opened 2001 at US\$3.17/lb with inventories at 9624 t and finished the year at US\$2.58/lb with inventories at 18 966 t. Nickel hit its high for the year in mid-May at US\$3.42/lb and its low at US\$2.00/lb at the end of October. Prices reacted in response to weak demand in major end-use nickel markets throughout much of the year. This was particularly true for stainless steel, the largest market for nickel. Stocks reached a low of 8304 t in mid-March and peaked at 19 002 t in mid-November. Copper opened the year at US\$80.9¢/lb, increased to US\$83.3¢/lb later in January, and then declined throughout the year to a low of US\$59.8¢/lb in early November before recovering to 66.3¢/lb at year-end. Copper use fell during the year, in large part due to reduced demand in the automotive sector. Cutbacks in production were not sufficient to prevent erosion in price levels. Copper stocks began the year at 358 625 t, fell to a low of 322 775 t in early March, and then climbed to reach their high at the end of 2001 of 798 675 t.

Aluminum began the year at US\$71.1¢/lb, increased to US\$78.8¢/lb in late January, declined to a low of US\$56.4¢/lb in early November, and finished the year at US\$60.6¢/lb. The use of aluminum fell, notably in the United States and, notwithstanding global production cutbacks, prices weakened. Indeed, inventories increased steadily from 326 825 t at the beginning of the year to 819 175 t at its end.

Zinc began 2001 at US\$46.2¢/lb, moved up to US\$47.8¢/lb in mid-January, and then steadily declined to a low of US\$33.3¢/lb in early November before recovering slightly to US\$34.8¢/lb to close out the year. Weakened demand and new capacity coming on stream combined to create a large zinc supply surplus, resulting in downward pressures on prices. Stocks began the year at 194 700 t and closed out the

year at more than double that at 433 375 t. The price of lead actually increased in 2001, ending the year at US\$22.9¢/lb, compared to US\$21.2¢/lb at the beginning of the year. It reached a high of US\$23.7¢/lb in mid-March and a low of US\$19.6¢/lb in early July. Lead-acid battery demand weakened in 2001, but limited availability of concentrate had a positive impact on prices, particularly late in the year. Inventories began the year at 131 150 t, increased to 143 930 t in early March, reached a low of 87 000 t in mid-December, and finished the year at 97 050 t.

Gold closed out the year at US\$276.50/oz, up fractionally from US\$271.10/oz at the beginning of 2001. The low for the year (US\$255.95/oz) occurred in early April and the high (US\$293.25/oz) in September following the terrorist attacks in the United States on September 11<sup>th</sup>. Globally, demand was down slightly and this lower demand, combined with a record gold production level in 2001, continued to have a negative effect on the price. Silver prices began the year at US\$4.59/oz, hit a high of US\$4.81/oz in late January, and then declined for most of the year to reach a low of US\$4.07/oz in mid-November. At that point, the price of silver rebounded, finishing at US\$4.50/oz, largely unchanged from the level at which it started the year. The supply of silver increased as China unloaded its silver reserves.

Palladium prices, which were bid up to extraordinary levels in 2000 and early 2001, returned to more normal levels in 2001. Palladium began the year at US\$965.00/oz, reaching a peak price in mid-January of US\$1090.00/oz, and then declined to a low of US\$315.00/oz in late November and ended the year by recovering to US\$440.00/oz. The resumption of Russian supplies entering the marketplace early in the year and the cessation of aggressive buying by one of North America's leading automotive producers were significant factors leading to this major price correction. Platinum prices, which tended to track those of palladium, also contracted in 2001, although not to the same degree as palladium, reverting to the historical pattern of platinum being more valuable than palladium. Platinum started the year at US\$608.00/oz, topped out at US\$639.50/oz in mid-January, declined to US\$415.00/oz in early October, and finished the year at US\$480.00/oz.

The spot price for uranium ( $U_3O_8$ ) was quoted at US\$9.50/lb at the end of 2001, an increase of nearly 34% over the US\$7.10/lb quoted 12 months earlier. During the same period, long-term contract prices for uranium increased from US\$9.25/lb to US\$10.50/lb, an increase of 13.5%. At year-end, cobalt was selling at about US\$6.75/lb, down sharply from the selling price of about US\$10.50/lb a year earlier. Potash was quoted at US\$128.00/t for standard grade, f.o.b. Vancouver, roughly the same as a year earlier. The price for sulphur, f.o.b. Vancouver at the end of 2001 was

US\$15-\$22/t, compared to US\$30-\$36/t at the end of 2000. This drop in prices was largely due to oversupply and strong competition in offshore markets.

International coal and iron ore prices are largely determined by annual Japanese reference or benchmark contract pricing. On this basis, coal prices for delivery into the Japanese market increased noticeably in 2001 as metallurgical coal (hard coking) increased by 7.5% to US\$42.75/t f.o.b. and thermal coal (steaming coal) increased by 20.0% to US\$34.50/t f.o.b., the latter due in part to strong oil prices. For iron ore, prices for concentrates bound for Europe and Japan increased by 4.55% and 4.29%, respectively, and by 1.84% for pellets bound for Europe (refer to Table 5 in the Iron Ore chapter).

## RESERVES

In 2000, Canadian reserves of copper, nickel, lead, zinc, molybdenum, silver and gold decreased. No decisions had been made to bring new mines into production for these metals, and the amount of new ore discovered at existing mining operations was insufficient to replace the quantity of ore mined during the year. This continued the ongoing trend of declining ore reserves that had begun in the early 1980s for base metals and in the late 1980s for gold. Improved prices for copper, nickel and zinc were overwhelmed by deteriorating prices for lead, molybdenum and silver, together with the stagnant price of gold.

## EMPLOYMENT IN THE MINERAL INDUSTRY

Combined employment in the four stages of the mineral industry (including coal mining) is estimated to have reached 375 784 in 2001, down 3.4% from the preliminary 2000 level of 388 911. The mineral industry thus accounted for approximately 2.6% of the national employment level of 15.1 million (including both full-time and part-time workers) in 2001.<sup>3</sup>

Employment in Stage 1 (metal, nonmetal [including quarries and sand pits] and coal mining) decreased by 9.8% to an estimated 46 423, down from 51 445 in 2000 as a significant number of mines closed permanently or suspended operations. Employment in metal mining decreased by 15.5% and in nonmetal mining by 5.0%. However, expanded coal mining

<sup>3</sup> Effective this year, these statistics are based on the North American Industrial Classification System (NAICS), which replaces the Standard Industrial Classification (SIC) system. This new classification standard is used by the three partners in the North American Free Trade Agreement (NAFTA), i.e., the United States, Mexico and Canada.

activity led to a 3.2% increase in coal mine employment during 2001.

Employment levels for Stages 2, 3 and 4 were all lower in 2001 compared to the previous year. Employment in Stage 2 decreased by 8.6% to 53 878. Employment increased in the smelting and refining of nonferrous metals and the production of aluminum, but declined in iron and steel. Stage 3 employment fell by 2.9% to 83 779, due in large part to the continued decline in iron foundry employment, which fell by 5.5%. Stage 4 employment in metallic mineral manufacturing decreased by 0.3% to 191 705 as primary metal manufacturing fell by 5.6%. The slowing down of North American economies was the main contributor to these employment decreases.

The level of employment in the sector that provides support for mining, quarries, and oil and gas wells is estimated to have increased by 16.2% to 50 284 in 2001, with the majority of those jobs servicing the oil and gas extraction industries. This sector provides drilling services, conducts exploration, and provides other services linked to mineral extraction. In 2001, the number employed in mining diamond drilling was estimated to be about 1300, roughly the same as in 2000. Because there are no establishment-based surveys undertaken at this time by either Natural Resources Canada or Statistics Canada for these support activities industries, these numbers should be viewed with caution.

## MINERAL INDUSTRY TRADE

Canada is one of the world's largest exporters of minerals and metals. The export of these commodities and more refined mineral products has a significant impact on Canada's overall merchandise balance of trade, and hence on the national standard of living. In 2001, the value of domestic exports of minerals and mineral products, including fuels, increased fractionally by 0.5% to \$100.3 billion from \$99.8 billion in 2000 (Table 2). With respect to the four stages of production, increases in exports in Stages 1 and 2 were sufficient to overcome decreases in Stages 3 and 4.

The United States is the leading destination by far for Canada's minerals and mineral product exports (non-fuel, but including coal), receiving total exports valued at \$36.2 billion in 2001, or 76.3% of total exports. The European Union followed with 9.7%, Japan with 3.6%, Mexico with 0.5%, and all other countries with 9.9%. The top 20 countries accounted for 97.2% of total domestic exports. Based on the four stages of production, the United States accounted for 33.6% of Stage 1 exports, 76.1% of Stage 2, 83.9% of Stage 3, and 91.6% of Stage 4.

The value of domestic exports of metallic minerals and mineral products (all four stages of production)

decreased by 5.5% to \$36.1 billion, compared to \$38.2 billion in 2000. On a commodity basis, decreases in the value of exports occurred for zinc (-21.7%), gold (-11.9%), nickel (-11.4%), iron and steel (-6.3%), and copper (-2.9%). Increases were shown by uranium (+47.9%), platinum group metals (+2.8%) and aluminum (+2.6%). Two commodity groups (aluminum, and iron and steel) accounted for 51.4% of these exports in 2001. For Stage 1 metallic commodities only, domestic exports decreased by 6.0% to \$3.7 billion in 2001. For individual metallic commodities in Stage 1, domestic exports declined for copper (-11.8%), zinc (-11.8%) and iron ore (-10.3%), while exports increased for molybdenum (+15.8%), platinum group metals (+14.3%) and aluminum (+3.3%). Three commodities, iron ore, copper and aluminum, represented 58.1% of all Stage 1 metallic exports in 2001.

The total value of domestic exports of nonmetallic minerals and mineral products (for all four stages) declined to \$9.3 billion in 2001 from \$9.5 billion in 2000, a decrease of 1.5%. Decreases were experienced by nitrogen (-11.1%) and potash and potassium compounds (-8.5%), while increases occurred for salt and sodium compounds (+30.0%), cement (+8.6%), and glass and glassware (+8.1%). Two commodity groupings, potash and potassium compounds, and glass and glassware, accounted for 37.5% of total nonmetallic domestic exports. For Stage 1 only, total domestic exports of nonmetallic commodities decreased by 1.0% to \$1.8 billion from \$1.9 billion in 2000. Exports that declined were sulphur and sulphur compounds (-37.5%) and asbestos (-15.1%). Exports increased for diamonds (+14.9%) and peat (+4.2%). Diamonds alone represented 40.9% of all Stage 1 nonmetallic domestic exports in 2001.

For mineral fuels, the total value of domestic exports increased by 5.3% to \$54.9 billion, up from \$52.1 billion in 2000. Natural gas exports increased by 24.5% to more than offset the 9.5% fall in petroleum exports. Domestic exports of coal and coke were up from \$1.9 billion in 2000 to \$2.0 billion in 2001, an increase of 6.0%. Of the total mineral fuels domestic exports (four stages), natural gas accounted for 46.7% and petroleum 45.5%. Stage 1 mineral fuels accounted for 79.4% of all domestic exports.

The value of total imports of minerals and mineral products, including fuels (four stages), decreased by 7.5% to \$64.2 billion from \$69.4 billion in 2000. Excluding fuels, but including coal, imports declined to \$46.6 billion in 2001, down from \$51.2 billion, a fall of 9.0%. Of this amount in 2001, shipments from the United States accounted for 69.0% of this total with the European Union at 8.8%, Mexico at 3.3%, Japan at 2.2%, and all other countries at 16.7%. The top 20 countries accounted for 93.0% of total imports. For the four stages of production, imports from the United States accounted for 63.4% of Stage 1



imports, 45.1% of Stage 2, 71.0% of Stage 3, and 72.3% of Stage 4.

The total value of metal imports decreased to \$37.1 billion in 2001 from \$41.7 billion in 2000, a decline of 11.0%. Decreases occurred for copper (-45.4%), gold (-15.4%), iron and steel (-12.1%), and aluminum (-2.8%). The latter two commodities, iron and steel, and aluminum, accounted for 53.7% of all metal imports in 2001. For nonmetals, import values were down by 1.2% to \$8.2 billion from \$8.3 billion in 2000. Commodities that declined in 2001 were phosphate and phosphate compounds (-17.9%) and graphite (-9.3%). Gains were experienced by salt and sodium compounds (+16.5%) and clays and clay products (+2.2%). Two commodities, glass and glassware products, and clay and clay products, accounted for 47.1% of total imports of nonmetals in 2001.

The balance of trade generated (total mining and mineral processing industry exports, including fuels, minus total mining imports, including fuels) increased by 18.9% in 2001 to \$37.9 billion. This trade surplus compares to \$31.8 billion in 2000 and \$17.7 billion in 1999. For the total economy, the trade surplus rose to \$59.3 billion in 2001 (+5.8%) from \$56.0 billion in 2000 and \$34.7 billion in 1999.

## INVESTMENT BY THE MINERAL INDUSTRY

Information on exploration expenditures and capital spending provides a useful indication of market conditions and of the perspectives that management and investors in the Canadian mining industry hold on future market conditions in relation to present productive capacity. In 2001, based on year-end valuations, 208 mining companies were listed on the Toronto Stock Exchange with a market capitalization of \$91 billion, compared to 245 mining companies with a market capitalization of \$67 billion in 2000 and approximately 300 companies with capitalization of \$80 billion in 1999. Also, at the end of 2001, the Canadian Venture Exchange included over 1200 junior mining and exploration companies.

### Exploration Expenditures

Final exploration data for 2000 show that exploration and deposit appraisal expenditures amounted to \$496.7 million, compared to \$504.3 million in 1999, a decrease of 1.5%. Preliminary estimates for 2001 indicate a further decline to \$491.3 million. Revised company spending intentions for 2002, however, rebounded to show a slight gain to \$518.2 million.

In 2000, increases in exploration and deposit appraisal expenditures were experienced in New Brunswick, Ontario, Manitoba, Saskatchewan and

Nunavut, with decreases in the other provinces and territories. Only Ontario had expenditures in excess of \$100 million in 2000 with spending at \$117.9 million, which accounted for 23.7% of total Canadian expenditures.

Mine complex development expenditures (including capital and repair expenditures) were \$3.6 billion in 2000, up 21.9% from 1999, with Quebec at 32.2% and Ontario at 22.3% of the total leading the way. Preliminary figures for 2001 show a further increase of 6.0% to \$3.8 billion with a sharp increase in the Northwest Territories for diamond mine expenditures. Company forecasts are estimated at \$3.2 billion in 2002, a decrease of 17.7% from 2001, but still up from the \$3.0 billion experienced in 1999.

The level of mineral exploration activity is closely linked to mineral commodity prices, so it is not unexpected that, when prices are depressed, exploration expenditures decline. When commodity prices show signs of strength, the mineral exploration industry can be expected to respond with increased activity.

### Capital Investment

In 2000, capital expenditures for construction and materials and equipment in the mining and mineral processing industries increased by 13.7% to reach \$7.3 billion. However, company spending intentions indicate that capital expenditures will fall to \$5.9 billion in 2001 and \$4.8 billion in 2002. This reflects the declining trend of new mine development in Canada. Of these totals, capital investment for the mineral extraction and concentrating industry (Stage 1) are estimated at \$2.8 billion in 2001, down from \$3.0 billion in 2000 but up from \$2.5 billion in 1999. The estimate for 2002 is \$2.3 billion. Capital investment in the smelting and refining industry (Stage 2) declined by 18.3% to \$724.6 million in 2001 from \$887.2 million in 2000. In 1999, capital expenditures were \$851.5 million. In 2002, reports on company spending intentions indicate an estimated level of \$655.5 million. For the nonmetals and metals-based semi-fabricating industries (Stage 3), capital investment fell sharply by 38.6% to \$1.6 billion in 2001 from \$2.6 billion in 2000 and \$2.3 billion in 1999. Another significant decline to \$1.2 billion is indicated for 2002. The metals fabricating industries (Stage 4) declined to \$802.4 million in 2001 from \$819.4 million in 2000 and \$840.7 million in 1999. Company intentions show a further drop to \$676.1 million in 2002.

In 2000, capital investment (construction, materials and equipment) in the total Canadian economy stood at \$187.4 billion. Estimates indicate an increase to \$195.9 billion in 2001 to be followed by a slight decline to \$194.0 billion in 2002. In 2000, investments in the mineral industry (Stages 1-4) accounted for 3.9% of these total Canadian capital expenditures.

This is estimated to drop to 3.0% in 2001 and 2.5% in 2002. When repair expenditures on structures, machinery and equipment are included, expenditures in the mining and mineral processing industries totaled \$11.6 billion in 2000, the latest year for which repair data are available. Of this total, \$4.5 billion was in Stage 1. The total in 2000 for all four stages represented 5.0% of the total capital and repair expenditures within the Canadian economy.

## HIGHLIGHTS IN THE CANADIAN MINING INDUSTRY

### Corporate Developments

Corporate operating profits in the Canadian mining industry were \$2.3 billion in 2001, compared to \$3.1 billion in 2000, but were higher than the \$1.4 billion recorded in 1999.

In March, North American Tungsten Corporation Ltd. announced that it would be re-opening its CanTung tungsten mine located in the Northwest Territories, near the Yukon border, north of Watson Lake, Yukon. Sandvik AB and Osram Sylvania Products Inc., leading producers and users of tungsten, will purchase all of the mine's concentrate output, estimated at some 900 000 t, over a three-year period. The mine, which last operated in 1986, and the MacTung deposit located some 160 km to the north are estimated to represent the Western World's largest high-grade proven tungsten reserves and to comprise some 15% of the world's proven tungsten resource base. The mine and mill are expected to be operating in early 2002.

In May, Cameco Corporation finalized arrangements to invest in the Bruce Power Limited Partnership (Bruce Power), which has leased the Bruce A and Bruce B power stations from Ontario Power Generation until 2018. The stations are located near Kincardine in southern Ontario. Cameco, the world's largest uranium supplier, will be the exclusive supplier of uranium fuel for the facilities and will purchase \$43 million of finished fuel inventory for resale to the partnership as needed. Ownership of Bruce Power is made up of British Energy (85%) and Cameco (15%). The 85% equity of British Energy can be reduced to 79.8% if the two main unions representing employees take up their full equity interest in the partnership that is available to them: the Power Workers Union (up to 4.0%) and the Society of Energy Professionals (up to 1.2%).

In June, Sherritt Coal Partnership, a partnership of Sherritt International Corporation and a subsidiary of the Ontario Teachers Pension Fund Board, completed the acquisition of all the securities of the Luscar Coal Income Fund (LCIF). The LCIF is an

open-ended trust that has invested in the securities of Luscar Coal Ltd. On September 14, 2001, Sherritt Coal Partnership announced the change of its name to Luscar Energy Partnership (LEP). Luscar produces approximately 38 Mt/y of coal from mines in western Canada.

In September, the Iron Ore Company of Canada (IOC) suspended reconditioning of its pellet plant in Sept-Îles, Quebec, due to deteriorating market conditions, particularly in North America and Europe, IOC's major markets. The \$360 million project was scheduled to come on stream in mid-2002 at a production rate of 4.5 Mt/y. Earlier in the year, the offer by Rio Tinto plc to purchase the 18.9% of IOC owned by the Labrador Iron Ore Royalty Income Fund (LIORIF) was turned down. However, Rio Tinto did manage to purchase a 20% stake in LIORIF. Ownership of IOC is split among three companies: Rio Tinto (56.1%), Mitsubishi Corporation (25.0%) and LIORIF (18.9%).

In November, Noranda Inc. announced that it was going to close its Gaspé copper smelter, located at Murdochville, Quebec, for six months effective at the end of April 2002, citing weak market conditions. The custom smelter treats copper concentrates from around the world, as well as recycled copper materials.

In December, the Prince coal mine, located at Point Aconi, Nova Scotia on Cape Breton Island, was closed. The mine, owned and operated by the Cape Breton Development Corporation (Devco), a federal Crown corporation, was shut down following unsuccessful efforts to sell the operation. It was the last mine producing coal in the Sydney coalfield of Nova Scotia and its closure brought to an end a period of coal mining that began in the early 1700s. Subsequent to the cessation of coal mining at Prince, later in December, Devco sold its surface assets (coal pier, the railroad infrastructure and the coal preparation plant) to Emera Inc., the parent company of Nova Scotia Power Inc. Emera will use the purchased assets to transport imported coal to the nearby coal-fired power stations at Point Aconi and Lingan.

The Diavik diamond project made significant progress in 2001 with major construction activities under way, including construction of the mill, capable of processing 5000 t/d of kimberlite ore, and the water diversion dikes. These dikes will enable open-pit mining of the four kimberlite pipes offshore near East Island in Lac de Gras in the Northwest Territories. The \$1.3 billion development, which will be Canada's second diamond mine, is scheduled to come on stream in April 2003. Current estimates of proven and probable reserves in the mine plan are 25.6 Mt of kimberlite at a grade of 4.0 ct/t having a value of US\$63/ct. The project is owned 60% by Diavik Diamond Mines Inc., a wholly owned subsidiary of

Rio Tinto plc, and 40% by Aber Diamond Mines Ltd., a wholly owned subsidiary of Aber Diamond Corporation.

Canada's potential third diamond mine at Snap Lake, located some 110 km south of the Ekati diamond mine in the Northwest Territories, is now on schedule to start production in 2006, and not 2004 as had been earlier indicated. De Beers Canada Mining, the owner of the kimberlite dyke project, has decided that more time is required for the permitting process and to further evaluate the resource and the mining plan. A land and water use permit application was filed in early 2001 with the Mackenzie Valley Land and Water Board to develop a 3000-t/d underground diamond mine. The current estimated reserves by De Beers for Snap Lake are 22.8 Mt at 1.63 ct/t with a value of \$US100/ct.

Consolidations continued to have an impact on the Canadian mineral industry in 2001 as significant mergers and takeovers occurred. In July, Teck Corporation and Cominco Ltd. merged to form Teck Cominco Limited. The new Teck Cominco will be a diversified mining and metals company with interests in mines producing gold, copper, zinc and metallurgical coal in North and South America and Australia, as well as zinc-refining complexes in British Columbia and Peru. It will be the fourth largest North American-based base-metal mining and refining company and the third largest in market capitalization. In October, the BHP Billiton Group completed its \$687 million takeover of Dia Met Minerals Ltd., thus acquiring Dia Met's 29% ownership in the Ekati diamond mine in the Northwest Territories and upping its total ownership in the diamond mine to 80%. In December, Barrick Gold Corporation completed the merger with Homestake Mining Company, making the new company the second largest gold producer in the world in terms of production and first in terms of market capitalization. Operations are located primarily in North America, Australia and South America. The new Barrick is estimating production of 5.7 million oz in 2002 from a reserve base of 84.3 million oz.

Inco Limited and the Government of Newfoundland and Labrador resumed discussions on the development of the Voisey's Bay nickel-copper-cobalt orebody in June. However, by year-end, although discussions were still ongoing, there were no signs of agreement. One of the major issues is where the ore will be processed, with the position of the province being that the mining plan should include the smelting of ore from the mine within the province.

Other important events in 2001 included:

- Northgate Exploration Limited expanding its inferred resources to 442 Mt grading 0.4 g/t gold

and 0.23% copper at its Kemess North project, 7 km north of its Kemess South gold-copper mine in western British Columbia;

- Goldcorp Inc. increasing gold reserves at its high-grade mine at Red Lake, Ontario, to 1.85 million tons grading 2.05 oz/ton (70.5 g/t);
- North American Palladium Ltd. opening its \$220 million mine expansion at Lac des Îles, in northern Ontario, which will increase mill throughput to 15 000 t/d; and
- Agnico-Eagle Mines Limited opening its new Penna shaft, the deepest single-lift shaft in North America, at its recently expanded LaRonde mine near Rouyn-Noranda.

## Industry and Government Initiatives

The Government of Canada, through Natural Resources Canada (NRCan), in full collaboration with the provincial and territorial governments and the mineral industry, undertakes activities to promote and support Canada's minerals and metals industry and mining-related equipment and services sectors. In 2001, these activities included:

- missions to Mexico (Minister-led), Korea and Japan;
- participation by NRCan in a number of trade shows and exhibitions, e.g.:
  - EXPOMIN-AMERICA 2001 - Santo Domingo, Dominican Republic,
  - Prospectors and Developers Association of Canada's International Convention, Trade Show and Investors Exchange - Toronto, Canada, and
  - Investing in the Americas Conference, Miami, United States;
- new projects under the Targeted Geoscience Initiative by the Geological Survey of Canada, including:
  - a geological study of diamond-bearing rock in the Fort à la Corne area of Saskatchewan, with Saskatchewan Energy and Mines and industry, and
  - geological research in the Flin Flon, Lynn Lake and Leaf Rapids areas in Manitoba, with Manitoba Industry, Trade and Mines.

In the Economic Statement and Budget Update of October 18, 2000, the Minister of Finance announced a temporary 15% investment tax credit for investors in flow-through shares of mineral exploration companies. This Investment Tax Credit for Exploration

(ITCE) is designed to assist junior mining companies in raising new equity through the issuance of flow-through shares and applies to eligible exploration expenses incurred after October 17, 2000, and before January 1, 2004.

In addition to the federal ITCE, several of the provincial governments have established similar tax credit programs. As part of its December 4, 2000, Economic and Fiscal Statement, the Ontario government announced that it would provide a 5% tax credit for Ontario investors in mining flow-through shares. This tax credit measure would complement the federal ITCE program. In its March 30, 2001, budget, the Government of Saskatchewan introduced a 10% tax credit for individuals who purchase flow-through shares in junior mineral exploration companies. In September 2001, the Quebec government announced the extension of its existing enhanced deduction program for flow-through shares until the end of 2003. In its April 22, 2002, budget, the Government of Manitoba introduced a 10% personal income tax credit for resident investors in flow-through shares of qualifying mineral exploration companies.

In April, the Government of Ontario and Laurentian University in Sudbury, Ontario, signed an agreement for a four-year, \$8 million program aimed at developing advanced technologies for mineral exploration. Laurentian's Mines and Minerals Research Centre will manage the Ontario Mineral Exploration Technologies Program (OMET) and will be assisted by a committee of technical advisors from industry, universities and the wider geoscience research community. This advisory committee will evaluate proposals and make recommendations to the OMET Management Board, which will comprise officials from the Ontario Geological Survey, Ontario university geology departments, and the Chair of the Ontario Geological Survey Advisory Board.

In July, the Yukon government and North American Tungsten Corporation Ltd. signed a road maintenance agreement in support of the company's re-opening of its CanTung tungsten mine in the Northwest Territories. The agreement provides for the Yukon to spend approximately \$900 000 on the re-opening, upgrading and maintenance of the Nahanni Range Road to the Yukon/Northwest Territories border, which is the only road access to the mine site. Once in operation, year-round maintenance will be shared, with the company responsible for approximately 70 km from the mine site, of which some 13 km are in the Northwest Territories and the balance is in the Yukon.

In August, the Government of British Columbia announced that, effective July 31, 2001, individuals who invest in flow-through shares may claim a credit equal to 20% of their British Columbia flow-through

mining expenditures to reduce British Columbia income tax. The Mining Flow-through Share Tax Credit is a non-refundable credit and any unused credit at the end of a taxation year may be carried back three years or carried forward ten years. The existing METC (Mining Exploration Tax Credit) 20% tax credit would remain for companies that do not use flow-through shares to finance their exploration activities.

In August, it was announced that the Canada-Quebec Infrastructure Work Program would provide \$6.6 million of the \$7.1 million required to relocate part of Highway 117 near Val-d'Or, Quebec, with McWatters Mining Inc. providing the balance. The relocation would enable McWatters to expand its open-pit operations at its Sigma-Lamaque gold mine.

In November, the Yukon government announced that the Yukon Mineral Exploration Tax Credit had been extended until April 1, 2003. The tax credit was implemented on April 1, 1999, to encourage mineral exploration in the Yukon. Under the program, individuals and corporations can apply for a tax credit of up to 25% for eligible off-mine-site mineral exploration expenditures. Prior to April 1, 2001, the rate was 22%. In the same month, the Yukon government announced increased funding of \$850 000 for the Yukon Mining Incentives Program and a commitment of \$500 000 for the Regional Mineral Development Program.

Also in November, the Department of Indian Affairs and Northern Development (DIAND) and Miramar Giant Mine Ltd., a wholly owned subsidiary of Miramar Mining, signed an agreement to extend the life of the Giant gold mine near Yellowknife, Northwest Territories. Miramar will continue to source Giant ore as a supplemental feed to its nearby Con mill while DIAND will contribute \$300 000 per month towards environmental compliance and holding costs.

In December, the Northern Ontario Heritage Fund Corporation (Heritage Fund) provided \$3 047 700 to the Ontario Prospectors Association (OPA) to complete the restructuring of the association. In November 2000, the Heritage Fund had provided nearly \$1 million as the first phase of a two-phase \$4 million investment. With the government funding, the OPA has been restructured into a more modern, professionally staffed association to serve the prospecting community in Ontario. In addition, it will now have the resources to partner with industry to leverage more investments in grass-roots mineral exploration opportunities.

Also in December, the Government of Saskatchewan revised its royalty regime for uranium production in the province to include a basic and a tiered royalty effective January 1, 2001. The basic royalty remains unchanged at 5% of gross sales of uranium and is

reduced by the province's resource credit equal to 1% of the gross sales of uranium. The tiered royalty is also based on gross sales of uranium, but only applies if the sales price of uranium exceeds prescribed levels adjusted for inflation and is only applicable after reductions for any capital allowances for a new mine or mill construction and certain mill expansions. Under the new regime, the marginal tax rate ranges from 4% to 19%, compared to 4% to 50% under the former regime.

## PROFILES OF THE LEADING MINERALS PRODUCED IN CANADA

### Gold

Canada has a long history of being one of the world's leading producers of gold. In 2000, Canada was the fifth largest global gold producer, trailing South Africa, the United States, Australia and China. Canada-based Barrick Inc. and Placer Dome Inc. are two of the top global gold-producing companies. Regionally, gold mining is carried out in all provinces and territories with the exception of New Brunswick, Nova Scotia and Prince Edward Island. Gold refineries are located in Quebec and Ontario. The main use for gold is in jewellery manufacturing with other important uses including electronics, dentistry and coinage.

In 2001, gold was Canada's leading metal as the value of gold shipments increased by 2.9% to \$2.1 billion. The volume of shipments increased by 2.2% to 157 854 kg.

### Copper

In global terms in 2000, Canada was ranked as the fifth leading producer of copper behind Chile, the United States, Indonesia and Australia. Canada-based Noranda Inc., Hudson Bay Mining and Smelting Co. Limited and Inco Limited are major world producers of copper. Regionally, copper is mined in New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan and British Columbia. Primary smelters are located in Quebec, Ontario and Manitoba with refineries in Quebec, Ontario and British Columbia. Copper's properties, especially its high electrical and thermal conductivity, good tensile strength, relatively high melting point and resistance to corrosion, make it and its alloys attractive for electrical transmission, water tubing, castings and heat exchangers.

In 2001, the value of copper production in Canada decreased by 9.8% to \$1.5 billion with production down by 1.7% to 611 160 kg. In value terms, copper was Canada's third leading metal in 2001.

### Zinc

Canada was the world's third largest producer of zinc in 2000, trailing China and Australia and ahead of Peru and the United States. Canada-based Teck Cominco Ltd. and Noranda Inc. are two of the largest zinc producers in the world. Regionally, zinc is mined in New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, British Columbia and Nunavut, with metallurgical plants located in Quebec, Ontario, Manitoba and British Columbia. The main uses of zinc are as a coating (galvanizing) for steel to protect it from corrosion, the manufacture of brass and bronze, and die-casting.

In 2001, the value of zinc production decreased by 9.6% to \$1.4 billion, although production increased by 7.9% to 1 009 571 kg. Zinc was Canada's fourth leading metal based on value of production.

### Nickel

Canada is the world's third leading nickel producer behind Russia and Australia. In 2001, the next leading producers were New Caledonia and Indonesia. Globally, the industry is relatively small and is dominated by several large producers, including Canada-based Inco Limited and Falconbridge Ltd. Nickel is mined in the provinces of Ontario, Manitoba and Quebec, with smelters in Ontario and Manitoba and refineries in Ontario and Alberta. Nickel's resistance to corrosion, high strength, pleasing appearance and suitability make it useful in many applications. Major markets include stainless steels (which use about 65% of nickel production), nickel and copper-based alloys, electroplating, alloy steels, and foundry products.

In 2001, the value of Canadian nickel production fell by 24.2% to \$1.8 billion, even though production amounted to 183 643 kg, an increase of 1.4% over 2000. Based on its value of production, nickel was Canada's second leading metal in 2001.

### Iron Ore

Historically, Canada has been a major producer of iron ore with North American steel producers being the major users of Canadian-mined iron ore. In global terms, however, Canada ranked eighth in production in 2000 behind Brazil, Australia, China, Russia, India, the United States and Ukraine. The major Canadian-based producers of iron ore are the Iron Ore Company of Canada and Quebec Cartier Mining Company. Regionally, production takes place in Newfoundland and Labrador, Quebec and British Columbia. Iron ore is upgraded in Canada for steel-making use as pellets, concentrates or sinter.

In 2001, the value of Canadian production fell by 18.9% to \$1.2 billion, with production falling by 23.5% to 27 Mt. Iron ore was Canada's seventh leading mineral commodity in terms of value.

## Uranium

Canada is the world's largest producer and supplier of uranium with exports accounting for about 80% of production. Globally, in 2000, the next leading producing countries were Australia, Niger, Namibia and Uzbekistan. All Canadian production occurs in Saskatchewan, with Canada-based Cameco Corporation being the world's largest producer. Cameco operates Canada's only uranium refining and conversion facilities, which are located in Ontario. Uranium is used principally as a fuel for nuclear power generating plants.

In 2001, the value of shipments from mines in Canada increased by almost 25% to nearly \$675.6 million with volume shipped of 12 992 tU, up by 31%. The value of uranium mine production was up almost 25% to about \$600 million for the 12 522 tU produced, a 17% increase.

## Potash

Potash refers to a group of potassium-bearing minerals and chemicals. The dominant potash product is potassium chloride, a naturally occurring pink, salty mineral for which Canada is the world's leading producer and exporter. Internationally in 2000, Russia, Belarus, Germany, Israel and Jordan were the other leading producers. Regionally in Canada, potash is produced in Saskatchewan and New Brunswick with the Potash Corporation of Saskatchewan Inc. being the largest potash producer and exporter in the world. Fertilizer use consumes over 90% of the output. Other uses include detergents, ceramics, chemicals and pharmaceuticals.

The value of Canadian production fell by 3.9% in 2001 to \$1.6 billion as the production volume fell by 9.4% to 8184 t.

## Diamonds

Canada became a diamond producer in 1998 with start-up of the Ekati mine in the Northwest Territories. The first full year of production was 1999. On a global scale, it is estimated that, in 2000, Canada ranked seventh in terms of the value of diamond production. This ranking will rise with the scheduled start-up of the Diavik mine in 2003 and the Snap Lake project in 2006 in the Northwest Territories. Besides jewellery manufacturing, tools and equipment manufacturing are important markets for diamonds.

In 2001, the value of diamond production in Canada increased by 35.5% to \$846.9 million as production rose by 51.3% to 3685 ct.

## OUTLOOK AND TRENDS FOR THE CANADIAN MINERALS AND METALS INDUSTRY

The flat to negative economic growth experienced globally, particularly in the last six months of 2001, is expected to turn around by the middle of 2002. Weaker consumer spending, excess inventories and diminished industrial investment, much of which were evident before September, and the terrorist attacks in the United States on September 11<sup>th</sup>, all contributed to the slowdown in economic activity. Globally, a U.S.-led revival in 2002 is expected to benefit all industrialized economies, and particularly Canada's as the bulk of Canada's exports flow into the United States. In addition, an early recovery in Asia appears likely. In Canada, continued low interest rates, minimal inflation rates, lower energy prices, the effects of government tax cuts and continued aggressive sales incentives by manufacturers and retailers are expected to be the foundation for an economic recovery in 2002.

As 2001 came to a close, most economists were beginning to raise their expectations for the Canadian economy in 2002 as there were signs that the slowdown, which began in 2001, may be shorter and less severe than initially thought. Strong consumer spending continued to underpin the economy. Most economists are forecasting Canadian GDP growth of about 3.0-3.5% in 2002, compared to the 1.5% experienced in 2001. For 2003, strong growth is expected to continue with real GDP expected to rise by about 3.6%.

Globally, forecasters are looking at about 2.8% GDP growth in 2002, up from the 2.5% growth in 2001. A 4.0% growth rate is forecast for 2003. The U.S. economy is forecast to increase by about 3.0% in 2002 and perhaps by slightly more than that in 2003. The Euro Zone is expected to experience growth of about 1.0% in 2002 and about 3.0% in 2003. South America (excluding Mexico) is looking at negative growth of about 1.5% in 2002 with a recovery of perhaps 3.0% growth in 2003, although continuing financial difficulties in Argentina and Venezuela may jeopardize this. Mexico's economy is expected to grow by about 1.7% in 2002 and by a robust 4.5% in 2003. Japan's economy is forecast to decline by 1.0% in 2002 and to grow by 1.1% in 2003. South Korea is expected to grow strongly by 5.5% in 2002 and by 6.0% in 2003, with China at 7.3% in 2002 and 7.5% in 2003.

The health of the global minerals and metals industry suffered in 2001 with softer demand conditions coupled with overcapacity for many mineral commodities, particularly the major base metals, crippling the industry and causing most commodity prices to remain weak for much of the year. Prices should firm up in 2002 with improving demand conditions as the global economy recovers and the effects of consolidations, mergers and closures in certain mining sectors take hold. Consequently, overall minerals and metals supply should be more in line with expected demand conditions.

The Canadian minerals and metals industry should benefit from the expected upturn in global economic activity. The firming of gold prices in late 2001, which has continued into early 2002, should benefit many Canadian companies. While new mine development will remain weak, exploration activity should strengthen, principally due to higher gold prices,

investment incentives and the ongoing strong interest in diamonds in many parts of Canada.

Notes: (1) Information in this review was current as of July 19, 2002. (2) This and other reviews, including previous editions, are available on the Internet at [www.nrcan.gc.ca/mms/cmy/index\\_e.html](http://www.nrcan.gc.ca/mms/cmy/index_e.html).

## NOTE TO READERS

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**TABLE 1. CANADA, PRODUCTION OF LEADING MINERALS, 2000 AND 2001**

		Volume		Percent Change 2001/2000	Value		Percent Change 2001/2000
		2000 (r)	2001 (p)		2000 (r)	2001 (p)	
		(000 tonnes except where noted)		(\$ millions)			
<b>METALS</b>							
Gold	kg	154 384	157 854	2.2	2 053.8	2 112.4	2.9
Nickel		181	184	1.4	2 323.8	1 763.3	-24.1
Copper		622	611	-1.7	1 684.1	1 520.6	-9.7
Zinc		936	1 010	7.9	1 567.3	1 416.4	-9.6
Iron ore		35 247	26 981	-23.5	1 424.4	1 155.2	-18.9
Uranium	tU	9 921	12 992	31.0	473.2	675.6	42.8
Platinum group	kg	15 304	18 154	18.6	478.5	568.8	18.9
Silver	t	1 169	1 224	4.7	279.0	267.9	-4.0
Lead		143	149	4.3	96.6	108.3	12.2
Cobalt	t	2 022	2 048	1.3	100.4	78.2	-22.1
Molybdenum	t	6 980	8 540	22.3	62.7	77.1	22.8
<b>NONMETALS</b>							
Potash (K <sub>2</sub> O)		9 033	8 184	-9.4	1 644.2	1 581.5	-3.8
Cement		12 612	12 986	3.0	1 258.7	1 312.5	4.3
Sand and gravel		238 901	225 991	-5.4	971.2	953.2	-1.9
Stone		118 222	119 805	1.3	881.3	884.1	0.3
Diamonds	000 carats	2 435	3 685	51.3	624.9	846.9	35.5
Salt		12 164	13 548	11.4	351.4	449.5	27.9
Lime		2 525	2 221	-12.0	237.6	212.4	-10.6
Clay products		..	..	..	175.4	195.2	11.3
Peat		1 277	1 187	-7.0	174.0	167.9	-3.5
Asbestos		310	294	-5.2	141.7	132.2	-6.7
Gypsum		8 572	8 119	-5.3	105.7	96.4	-8.7
Nepheline syenite		717	734	2.4	62.4	64.4	3.3
Quartz (silica)		1 508	1 567	3.9	41.2	41.4	0.3
Sulphur, in smelter gas		831	832	0.1	56.6	35.5	-37.3
Soapstone, talc, pyrophyllite		85	55	-35.3	25.5	16.6	-34.7
Sulphur, elemental		8 621	8 080	-6.3	92.4	1.2	-98.7
<b>MINERAL FUELS</b>							
Natural gas	million m <sup>3</sup>	167 790	171 966	2.5	27 827.7	33 814.9	21.5
Petroleum, crude	000 m <sup>3</sup>	127 809	130 526	2.1	30 523.6	25 941.3	-15.0
Natural gas by-products	000 m <sup>3</sup>	30 543	29 789	-2.5	5 660.7	4 681.7	-17.3
Coal		69 163	70 361	1.7	1 427.4	1 546.8	8.4

Sources: Natural Resources Canada; Statistics Canada, *Canada's Mineral Production, Preliminary Estimates*, 2001, cat. no. 26-202-XIB.

.. Not available; (p) Preliminary; (r) Revised.

Notes: Numbers have been rounded. Percent changes are based on unrounded data.

**TABLE 2. CANADA, VALUE OF DOMESTIC EXPORTS, TOTAL EXPORTS (INCLUDING RE-EXPORTS), IMPORTS AND BALANCE OF TRADE OF MINERALS AND MINERAL PRODUCTS, STAGES I-IV (CUSTOMS BASIS), 1997-2001**

	1997	1998	1999	2000	2001
	(\$000)				
<b>TOTAL MINING, INCLUDING FUELS</b>					
Domestic exports	71 497 519	68 382 987	71 861 568	99 760 255	100 272 302
Total exports	72 967 313	69 521 529	73 031 845	101 236 115	102 016 024
Imports	50 001 459	53 725 050	55 326 622	69 388 071	64 160 286
Balance of Trade	22 965 854	15 796 479	17 705 223	31 848 044	37 855 738
<b>NON-FUEL MINING</b>					
Domestic exports	41 714 556	42 810 685	42 643 711	47 643 967	45 417 794
Total exports	42 544 308	43 799 352	43 671 837	48 954 023	46 746 568
Imports	37 152 635	42 913 543	43 763 988	50 004 848	45 313 316
Balance of Trade	5 391 673	885 809	-92 151	-1 050 825	1 433 252
<b>TOTAL NON-FUEL MINING, INCLUDING COAL</b>					
Domestic exports	44 449 126	45 333 227	44 688 047	49 516 640	47 402 881
Total exports	45 279 935	46 322 890	45 719 662	50 828 808	48 732 160
Imports	38 031 799	44 055 070	44 880 463	51 176 440	46 576 292
Balance of Trade	7 248 136	2 267 820	839 199	-347 632	2 155 868
<b>TOTAL ECONOMY</b>					
Domestic exports	280 033 595	297 509 218	331 433 928	385 363 738	373 447 193
Total exports	298 072 001	318 444 012	355 105 966	412 900 022	402 295 585
Imports	272 946 323	298 386 345	320 378 550	356 851 381	343 002 846
Balance of Trade	25 125 678	20 057 667	34 727 416	56 048 641	59 292 739

Sources: Natural Resources Canada; Statistics Canada.