

# General Review

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## **OVERVIEW**

**G**lobal economic activity was buoyant throughout 2000 although, to a large degree, it was driven by strong sustained demand growth in the United States. Many economies, including Canada's, were being driven by their export sector and the United States was a major destination for these products. In many countries, economic activity was mixed but positive and inflation and interest rates were stable. However, the sharp increase in energy prices during the year, driven mainly by significantly higher global oil prices, and weakening consumer demand were beginning to take effect in the marketplace. Indeed, as early as mid-year, there were signs of economic activity levelling off. By the last quarter of 2000, and particularly in December, it was apparent that a significant adjustment had begun as economic activity slowed noticeably, particularly in the United States.

The strong level of world economic activity evident for most of the year benefited the global mineral industry. Prices for most mineral commodities were strong throughout much of the year and this translated into higher revenue and profits for mineral and metal producers. Under-valuation of assets created opportunities for a number of takeovers and consolidations. Although the profits of Canadian producers were up significantly, the industry was not as profitable as might have been expected. With the exception of platinum and diamond activity, mineral exploration continued to be soft. Higher energy prices increased operating costs significantly. Even though more mines closed than opened, mine employment increased following several years of declines. On the fuel side, although revenues increased substantially

due to booming prices for crude petroleum and natural gas, Canadian production increased only modestly.

Canada's real Gross Domestic Product (GDP), measured at market value in 1992 prices, increased by 4.7% to \$921.5 billion in 2000 from \$880.3 billion in 1999. Both interest rates and inflation remained low during 2000, although slightly higher than those experienced in 1999. These factors, combined with employment growth, led to an unemployment rate of 6.8% at the end of 2000, the same rate as at the beginning of the year, but considerably lower than the 1999 average of 7.6%. The value of the Canadian dollar vis-à-vis the U.S. dollar remained weak and closed the year at \$0.6669, down from \$0.6888 at the start of 2000. Total Canadian exports increased to \$417.7 billion, up 15.8% from 1999, while total imports rose by 11.1% in 2000 to \$363.2 billion.

The estimated value of production for all sectors of the mining and fuel extraction industry showed an incredible increase of 55.9% from \$54 billion in 1999 to \$84 billion in 2000. This level set a record for the value of Canadian mineral production, topping the previous all-time high established in 1999. This increase was due principally to the significantly higher prices for crude petroleum and natural gas that prevailed during 2000. When fuels are excluded, the value of production for the mining industry increased by 8.3% to \$18.5 billion from \$17.1 billion in 1999. Of this, metals increased by 13.1% and nonmetals increased by 1.8%. **(The above figures are for domestically mined minerals and do not include the value of primary aluminum production because it is produced from imported bauxite ore, nor do they include the value of recycled material.)**

The value of domestic exports for non-fuel mining and mineral processing products rose to \$49.1 billion (including coal), a 10% increase over 1999. This represented 12.8% of Canada's total domestic exports. Canadian imports of non-fuel mining and mineral processing products, including coal, rose by 13.9% to \$50.7 billion, resulting in a small merchandise trade deficit (total exports minus total imports) of \$255 million in 2000.

Prices for the major metal commodities opened the year on a strong note and rose, peaking, in most cases, in the third quarter of the year. Subsequently, the major nonferrous metals (nickel, copper, zinc, lead and aluminum) actually finished the year at prices lower than at the start of the year. Gold and silver prices peaked earlier in the year; however, palladium and platinum ended the year on an exceptionally strong basis with the price of palladium approaching US\$1000/oz and platinum at over US\$600/oz.

Significant developments affecting the Canadian mineral industry in 2000 included:

- excellent financial performances, particularly by the major integrated companies;
- generally firm mineral commodity prices throughout the year, but softening towards year-end;
- strong mineral development activity continuing in Canada's diamond industry, including the announcement of the decision to develop Canada's second diamond mine;
- a continuing impasse at the Voisey's Bay nickel development in Labrador;
- consolidation in ownership of major Canadian mining operations;
- active exploration for platinum and diamonds while overall exploration activity remained flat;
- more mine closings than openings;
- increased mine employment; and
- increased operating mine and processing costs because of significantly higher energy costs.

## OUTLOOK AND IMPACTS ON THE CANADIAN MINING INDUSTRY

The outlook for the Canadian mining industry in 2001 is clouded by the sharp weakening of the U.S. economy and, to a lesser degree, of the Canadian economy in the last quarter of 2000. Positive economic growth, but significantly less than during the past several years, is still expected, although the possibility of a mild recession remains. Several quarters may be needed to deplete excess inventories in many sectors of the North American economy. The slowdown in the United States will also have an impact on the health of the global economy as many national economies depend on exports to the United States, including Canadian mineral and metal producers. Mineral commodity prices, in general, are expected to remain relatively stable for most of the year. Glob-

ally, corporate consolidations and ongoing mining cost reductions have eliminated some high-cost production and large-capacity, low-cost projects are coming on stream, notably for copper, gold and nickel. The reduction in high-cost operations would be even more striking if the local currencies of most major producing countries were not so weak relative to the U.S. dollar. Major metal prices, despite lower inventories, were not high at the beginning of 2001 and will not respond to upward pressure on prices until consumer and investor-owned inventories overhanging the market are eliminated. Higher petroleum and natural gas prices drove up the demand for thermal coal in 2000 and the price was up in early 2001 by some 15% to about US\$33/t. As well, a contraction in the supply of metallurgical coal over the past several years has led to an increase in early 2001 of about 7.5% in the Japanese reference price to US\$42.75/t. Iron ore prices for standard fines were up by 4.3% for 2001 Japanese reference contracts.

Based on company spending intentions for 2001, exploration expenditures are expected to remain soft. For many companies, diamonds and platinum group metals are the only targets of interest. With the price of gold trading in the US\$260-\$280/oz range for much of 2000, new low-cost, large gold projects scheduled to come on stream, and official sales (sales from gold reserves) still taking place, gold exploration is not attracting the investor interest that it normally does.

The Toronto Stock Exchange (TSE) continued to be the world's leading stock exchange for raising equity for mining companies in 2000, although the number of mining companies listed declined in 2000. At the end of the year, 245 companies were listed with a market capitalization of \$67 billion. This compares to nearly 300 companies in 1999 with a capitalization of \$80 billion.

## CANADIAN ECONOMY

The Canadian economy performed well as GDP grew by 4.7% in 2000 compared to 4.5% in 1999. Although by recent standards interest rates and inflation remained at low levels, the trend in 2000 was edging towards higher interest rates and increasing levels of inflation. The Bank of Canada raised its bank rate by 25 basis points in February, another 25 basis points in March and a further 50 basis points in May, bringing the rate to 6.00% where it remained for the rest of the year. The annual inflation rate averaged 2.7% for 2000, up from 1.7% for all of 1999, but rose to an annualized rate of 3.2% late in the year, a mark just outside the Bank's annual target range of 1-3%. Consumer confidence and spending remained firm. Canada Mortgage and Housing Corporation announced that housing starts increased by 1.1% in 2000 to 151 700 units. According to Statistics

Canada, the value of building permits reached \$37.0 billion in 2000, an increase of 3.4% over 1999. Of this amount, residential homes accounted for \$20.3 billion, an increase of 1.9% from 1999. The Canadian Real Estate Association estimates that house sales across Canada on the Multiple Listing Service declined fractionally from 334 043 in 1999 to 333 198 in 2000. Sales of new vehicles in Canada rose by 3.2% to 1.55 million. Canadian automotive producers announced the production of 2.9 million motor vehicles in 2000, down 2.3% from 1999 levels.

#### CANADIAN ECONOMIC CONDITIONS

Leading Indicators	1999	2000	% Change
Real GDP (\$ billion, 1992 prices)	880.3	921.5	+4.7
Consumer prices (% annual change)	+1.7	+2.7	n.a.
Operating profits (\$ millions)	168.3	197.7	+17.5
Unemployment rate (% annual average)	7.6	6.8	-10.5
Merchandise trade balance (\$ billion)	38.4	59.3	
Housing starts (000)	150.0	151.7	+1.1
U.S. exchange rate (annual average)	0.6730	0.6733	+0.04
International current account balance (\$ millions)	1 690	26 894	n.a.
Global economic output (% change)	+2.5	+3.3	n.a.

Source: Natural Resources Canada.  
n.a. Not applicable.

Employment in Canada rose by 325 000, or some 2.2%, in 2000, down from 427 000, or 3.0% growth, in 1999. The unemployment rate at the end of December 2000 was 6.8%, the same rate that was in effect 12 months earlier at the end of 1999.

On the trade front, total merchandise exports continued to grow, reaching \$417.7 billion in 2000, an increase of 15.8% over 1999. Despite an increase in imports, Canada's trade surplus rose to \$54.5 billion, up from a surplus of \$33.8 billion in 1999 and \$19.1 billion in 1998. The 2000 surplus contributed to Canada's overall international current account surplus of \$26.9 billion. At year-end the Canadian dollar was trading at 66.7¢ in U.S. funds, down from 68.9¢ at the beginning of the year. The average value of the dollar for the year was 67.3¢.

Global economic activity increased strongly in 2000 to an estimated 4.8% growth rate, up from 3.5% in 1999. The U.S. economy continued to perform well with 5.0% growth, up from 4.2% in 1999. The European Union increased by 3.4%, up from 2.6% in 1999, with Germany growing strongly from 1.4% in 1999 to 3.1%

in 2000. The South American economies grew at a 2.7% rate in 2000 compared to 0.1% in 1999. China's growth continued with an 8% growth rate in 2000, up from 7.1% in 1999, while Japan showed growth of 1.5% compared to 0.8% in 1999. However, as 2000 came to a close, there were indications that growth had begun to slow in many economies.

The Canadian mining and mineral processing industries can be characterized by the following four stages of processing activity:

- Stage 1: Mineral extraction and concentrating (for example, gold mining, sand and gravel quarrying);
- Stage 2: Smelting and refining (for example, non-ferrous 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 the importance of this industry 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.

#### CANADIAN MINERAL INDUSTRY

Leading Mining Indicators	1999	2000	% Change
Value of non-fuel mineral production (with coal) (\$ millions)	18 586	19 843	+6.76
Exploration expenditures (\$ millions)	504.3	473.4	-6.1
Metal Prices Index (1992=100)			
Precious metals	85.9	85.3	
Base metals	80.5	97.9	
Direct mining employment (000)	53.3	54.0	+1.2
Value of mineral and mineral product exports including coal (\$ billions)	44.6	49.1	+10.0
Mining company operating profits (\$ billions)	1.4	3.1	+122.8
Mine financing (\$ billions) (Gamah International)	5.3	5.8	+10.1

Source: Natural Resources Canada.

## GDP OF THE MINERAL INDUSTRY

In 2000, the mineral industry, as defined above, contributed \$27.9 billion, or 3.6% of Canada's total GDP of \$786.9 billion. This is an increase of 2.1% over 1999. (In this section, all figures are based on GDP at factor cost and at 1992 prices.) Mining and quarrying contributed 26.9% of the industry's GDP in 2000 while smelting and refining and primary steel production added a further 14.9% to the total. Non-metals and metals-based semi-fabricating accounted for 24.6% and metals fabricating accounted for the remainder at 33.6%.

For mining only (Stage 1), increases in the GDP in 2000 were exhibited by iron mines (up 16% to \$514 million) and potash (up by 10.5% to \$853 million), whereas coal declined by 5.3% to \$944 million. The GDP for services incidental to mineral extraction rose by 41.9% to \$3.5 billion in 2000, probably due to increased activity in the oil and gas sector. The GDP for the other stages increased in 2000 relative to 1999 – Stage 2 was up 1.0% to \$4.2 billion, Stage 3 was up 1.4% to \$6.9 billion, and Stage 4 was up 3.6% to \$9.4 billion.

Because these figures are based on 1992 prices, an increase in the value of production indicates an increase in the volume of goods produced. These proportions can be somewhat misleading, however, in that they are based on 1992 prices. Because current price data by industry are only available up to 1997, they do not reflect commodity prices as they were in 2000.

## CANADIAN MINERAL PRODUCTION

Based on preliminary estimates, the total value of Canadian mineral production (including fuels) reached \$84.2 billion in 2000, an increase of 55.9% over 1999. Of this total, \$65.7 billion was attributable to fuels, reflecting the significantly higher prices received for crude oil and natural gas produced in 2000. The non-fuels portion of the total also contributed to the increased value of total Canadian production, rising by 8.3% to \$18.5 billion.

The value of metal production increased by 13.1% to \$11.1 billion in 2000 from \$9.8 billion in 1999 as significant increases occurred in the value of nickel, copper and platinum group metals. Nickel production rose by 2.4%, but substantially higher prices led to a 48.1% increase in value to \$2.4 billion, making it the highest-value non-fuel mineral produced in Canada in 2000. Copper production rose by 7.2% and, coupled with slightly higher prices, led to a total value of \$1.7 billion. Platinum group metals had a strong year, rising in value to \$464.5 million, an increase of 85.5% over 1999, despite only a small increase in the volume of production of 11.3%. Prices increased

## CANADIAN MINERAL INDUSTRY VALUE OF PRODUCTION

	1999 <sup>r</sup>	2000 <sup>p</sup>	Change
	(\$ millions)		(%)
Metallic minerals	9 796.5	11 078.9	13.1
Nonmetallic minerals	7 315.4	7 448.5	1.8
Total non-fuels	17 111.9	18 527.4	8.3
Fuels	36 899.7	65 698.6	78.0
Total	54 011.6	84 226.0	55.9

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

<sup>p</sup> Preliminary; <sup>r</sup> Revised.

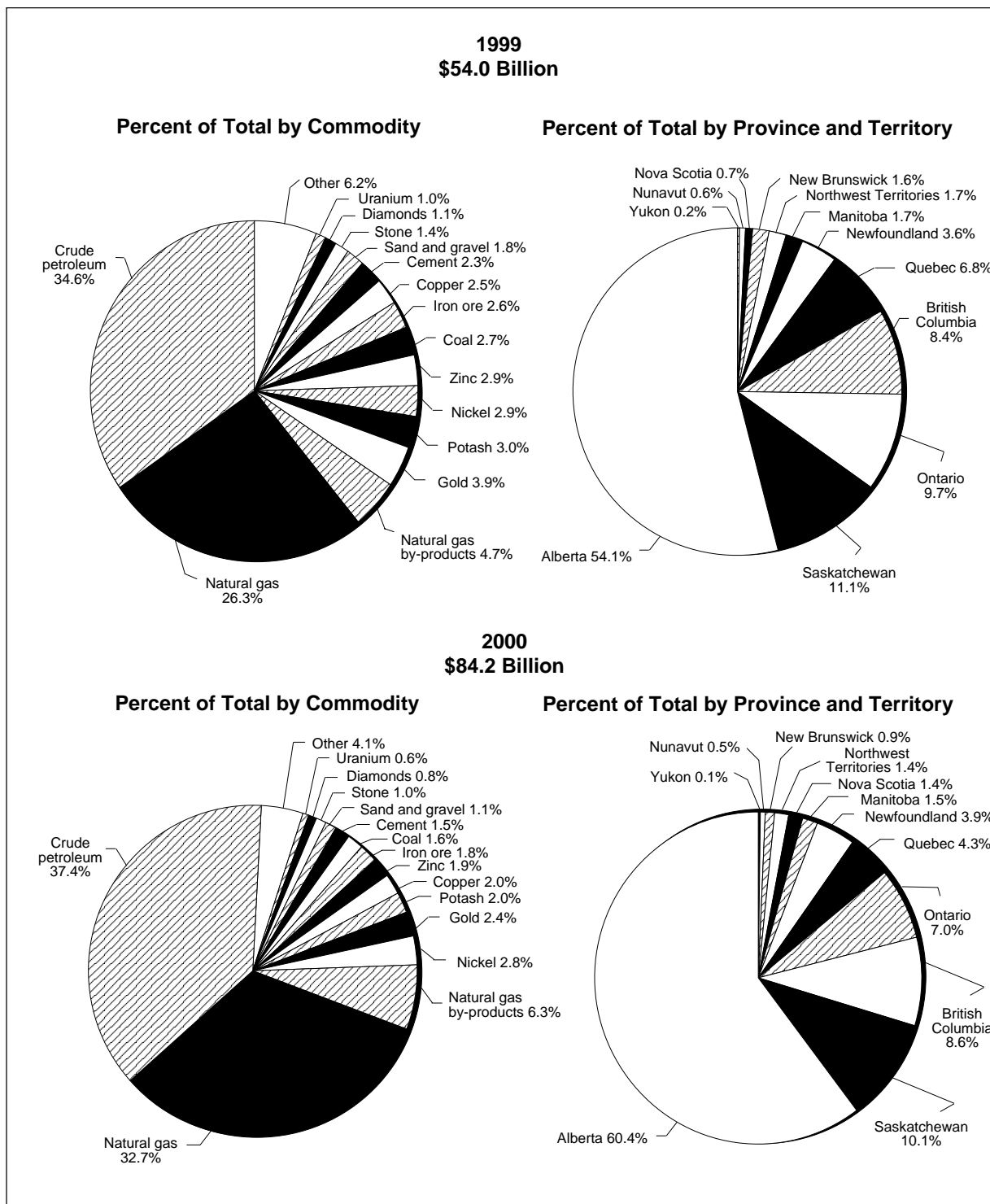
Note: Numbers may not add to totals due to rounding.

dramatically; the price of palladium, for example, more than doubled during the year to over US\$950/oz at the end of the year.

Gold was Canada's second leading metal with a value of output of \$2.0 billion. This was a decrease of 2.6% compared to 1999 and reflected a 2.4% decline in production. Gold and nickel were the only two metals produced in Canada with a value of production over \$2 billion in 2000. Among the value of other metals, zinc increased by 1.7% to \$1.5 billion (although production was down by 2.9%), iron ore increased by 9.6% to \$1.5 billion (production was up by 5.1%), uranium declined by 7.7% to \$485 million (production was down by 2.3%), silver declined by 5.8% to \$277.3 million (production fell 1.1%), cobalt declined by 10.0% to \$101.1 million (even though production remained virtually the same), lead fell by 17.3% to \$95.8 million (production was down by 7.9%), and molybdenum increased by 8.1% to \$64.4 million (production increased by 9.3%).

The value of production for nonmetals (including structural materials) increased to \$7.4 billion in 2000, a rise of 1.8% over 1999. Increases in the value of potash, cement and diamonds more than offset the declines in salt, asbestos and gypsum. The value of production for potash increased by 4.9% to \$1.7 billion as production rose by 7.5%, reflecting firmer demand for fertilizer products. Although the construction industry was buoyant in Canada during 2000, the experience of the major construction materials was mixed. Cement rose to \$1.3 billion, up 2.2%, with production falling fractionally by 0.2%; sand and gravel declined by 0.2% to \$956.2 million with production increasing by 1.6%; and stone increased by 6% to \$821.9 million while production was up by 2.9%. Diamonds rose in value to \$638.2 million, an increase of 5.3% over 1999. Production increased by 5.3% as Canada's only diamond mine completed its second full year of production.

**Figure 1**  
**Value of Mineral Production, Percent Shares by Commodity and by Province and Territory,**  
**1999 and 2000**



Sources: Natural Resources Canada; Statistics Canada.

Notes: The provincial shares may not add to 100% due to rounding. Prince Edward Island's share is excluded as it is too small to be expressed.

Among other nonmetals, salt declined by 7.3% to \$346.5 million (production declined by 5.9%), lime was up fractionally by 0.6% to \$240.2 million (production was down by 0.7%), asbestos was down 10.6% to \$143.9 million (production was down 5.0%), elemental sulphur was up by 1.4% to \$98.4 million (production was down by 1.6%), and sulphur in smelter gas was down by 5.8% to \$54.5 million (even though production was up by 0.7%).

The value of production for mineral fuels increased dramatically in 2000 from \$36.9 billion to \$65.7 billion, a rise of 78.0%. Sharply higher international prices for crude oil and higher prices for natural gas in North America led to significant increases in the value of Canadian production. On the production side during 2000, coal was down by 4.6% while natural gas was up by 2.4%, natural gas by-products were up by 2.8% and crude oil was up by 7.7%.

Based on the value of production for 2000, the top non-fuel commodities were nickel (\$2.4 billion), gold (\$2.0 billion), potash (\$1.7 billion), copper (\$1.7 billion), zinc (\$1.6 billion), iron ore (\$1.5 billion) and cement (\$1.3 billion). In terms of the production of Canada's leading minerals, increases in output in excess of 5% were recorded for copper, iron ore, platinum group metals, molybdenum, potash and diamonds, whereas declines of 5% or more were experienced by lead, salt, asbestos and gypsum (Table 1).

Geographically, the importance of the industry may be more significant on a regional and community basis as, in many parts of Canada, particularly in the North, it provides a major economic stimulus. Well over 100 communities were heavily reliant on mining 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 2000, accounting for slightly more than 73% of the total. Ontario contributed the largest share of the non-fuel mineral output at 30.8% of the total value while Quebec contributed 19.5%, Saskatchewan, 11.9%, and British Columbia, 11.2%. For the other provinces and territories, Newfoundland accounted for 5.6%, New Brunswick for 4.1%, the Northwest Territories for 3.8%, Alberta for 3.5%, Nunavut for 2.1%, Nova Scotia for 1.2%, and the Yukon for 0.3%. The value for Ontario increased by 11.3% to \$5.7 billion, Quebec was down fractionally by 1.1% to \$3.6 billion, Saskatchewan was up 1.3% to \$2.2 billion, and British Columbia was up 25.5% to \$2.1 billion. When coal is included, the value of Saskatchewan production climbs to \$2.3 billion, up 1.1% from 1999, and the value of B.C. production increases by 14.5% to \$2.8 billion.

Alberta is Canada's major mineral fuels producer with a value of production of \$50.2 billion in 2000,

which accounted for 76.4% of Canada's total. Alberta produces a full complement of mineral fuels: crude petroleum, natural gas, natural gas by-products and coal. Other provinces with significant mineral fuels production are Saskatchewan with 9.6% and British Columbia with 7.9% of Canada's total. Newfoundland accounted for 3.4% and the other provinces and territories accounted for the remaining 2.8%.

Of the six mine openings in 2000, two were in Quebec (gold and asbestos) and there was one in each of Ontario (gold), Manitoba (zinc), the Northwest Territories (gold) and Nunavut (gold). Of the thirteen closings, five were in Quebec (two gold, two copper and one wollastonite), three were in Alberta (coal), two were in Ontario (gold), two were in British Columbia (asbestos and coal), and one was in Manitoba (gold).

## METAL AND MINERAL COMMODITY PRICES

The strength of metal and mineral commodity prices experienced for most of 1999 continued into 2000 in response to the ongoing robustness of the global economy. The GDP for the world economy is estimated to have increased by 4.8% in 2000, up from 3.5% in 1999.

Prices for the major base metals opened strong in 2000 and increased during most of the year before peaking, in most cases, in the third quarter. The notable exceptions were aluminum, which peaked in January, and nickel, which hit its high in March. With the slowdown in economic activity in the last quarter of the year, the major nonferrous metals (nickel, copper, zinc, lead and aluminum) finished the year at prices lower than at the start, despite metal exchange inventories at or near their lows for the year.

Based on trading on the London Metal Exchange, nickel opened the year at US\$3.74/lb with inventories at 47 304 t and ended the year at US\$3.26/lb with inventories at 9678 t. Nickel hit its high of US\$4.84/lb in March and its low of US\$3.20/lb in December. Demand for nickel for use in stainless steel was strong, particularly during the first six months, and the nickel market was affected by events that had an impact on the supply at various times during the year. Copper opened the year at US\$5.4¢/lb, fell to US\$7.2¢/lb in March, peaked at US\$9.1¢/lb in September and declined to US\$8.2¢/lb by year-end. Copper inventories began the year at 789 975 t and ended it at 357 225 t as automotive and construction demand for copper remained strong for most of the year. Zinc began 2000 at US\$5.0¢/lb, moved up to US\$7.9¢/lb in September and, by year-end, had reached its low for the year at US\$4.3¢/lb. Inventories of zinc declined to 194 775 t by the end of the year from 279 050 t at the start. Galvanized steel

demand (a major use of zinc) was strong until the latter part of the year while, overall, global demand-supply for zinc came more into balance in 2000.

Lead prices remained within a narrow range for the year, opening at US\$21.5¢/lb and closing the year at US\$21.4¢/lb, having peaked at US\$23.5¢/lb in September and hitting their low of US\$18.1¢/lb in April. Lead inventories opened the year at 176 675 t and fell to 130 650 t by year-end. Globally, the demand for batteries continued to be firm and lead exports from China remained strong. Aluminum began the year at US\$73.3¢/lb, peaked at US\$79.2¢/lb later in January, dipped to its low in April of US\$63.4¢/lb, and recovered to end the year at US\$70.8¢/lb. Aluminum inventories declined by over half during the year, beginning at 771 275 t in January and ending 2000 at 321 850 t. Demand for aluminum by the automotive industry was strong for most of the year. Besides the slowing of economic activity towards the end of the year, aluminum market dynamics were affected during the year by corporate consolidations and smelter cutbacks caused by the energy crisis on the west coast of the United States.

For precious metals, gold closed out the year at US\$272.65/oz, down from US\$281.50/oz at the start of 2000. Although gold hit US\$312.70/oz in mid-February, gold prices were negatively affected by ongoing official sales of gold, principally the regular gold sales by the Bank of England, notwithstanding the September 1999 *Washington Agreement* under which European banks agreed to limit gold sales. Gold dropped to its low for the year in October at US\$263.80/oz. Hedging, a general lack of investor interest, and continuing efforts by producers to lower mining costs also weighed on the market. However, companies operating in certain countries (e.g., Australia) benefited from the strength of the U.S. dollar as gold prices rose in terms of local currency. Silver began the year at US\$5.30/oz, hit its high of US\$5.37/oz in late January, and then declined steadily to US\$4.58/oz on the last trading day of 2000. By year-end, the United States Defense National Stockpile Center delivered the last of its remaining stockpile of silver to the United States Mint for coinage. Palladium was again affected by uncertainty of supply from Russia, which currently supplies about two thirds of the market, and the price skyrocketed to reach US\$970/oz in late December. The price began the year at US\$443/oz, declined slightly to US\$433/oz, finished the year at US\$954/oz, and then hit US\$1085/oz in mid-January 2001. Platinum prices, which averaged about US\$440/oz in January, hit a high of US\$622/oz in December 2000 and finished the year at US\$611/oz, up 37.9% for the year, but significantly less than the price level reached by palladium.

For other mineral commodities, the spot price for uranium ( $U_3O_8$ ) was quoted at US\$7.10/lb at the end of

2000, a decline of 26% from US\$9.60/lb at the beginning of the year. During the same period, long-term contract prices for uranium fell by about 10% to US\$9.25/lb. At year-end, high-grade cobalt was selling at about US\$13.50/lb. Entering 2000, sulphur price quotations on a free on board (f.o.b.) basis were between US\$35 and US\$39/t. Quotations rose to US\$40-\$42/t by February and then plateaued until June when they started to show some weakness. By the end of 2000, prices had decreased to US\$30-\$32/t, largely in response to increased competition from Middle Eastern producers in some of Canada's traditional markets. Quoted prices for potash, f.o.b. Vancouver, were unchanged from 1999 at US\$110-\$129/t for standard grade and US\$128-\$132/t for granular. Coal prices, which are largely determined by Japanese reference contracts, declined in 2000. High-grade metallurgical coal for export declined by 5% to US\$39.75/t while export thermal coal fell by 4% to US\$28.75/t. Japanese iron ore reference prices increased, with the price for fines increasing by about 4.3% and the price for lump ore increasing by about 5.8%. Pellet prices for European markets were up by just under 6%.

## RESERVES

Canadian reserves of copper, molybdenum, lead, nickel, silver and gold decreased significantly during 1999 and zinc reserves maintained the same level as at the end of 1998. Because prices were lower in 1999 than in 1998, the ore reserve calculations used by companies resulted in ore reductions at many operations. Lower metal prices reduce the level of reserves because lower-grade reserves become uneconomical to mine and are removed from reserves. However, production is normally the main factor reducing the reserves at individual mines. Mine closures also contribute to reducing reserve levels. Canadian reserves of copper, nickel, lead, zinc, molybdenum and silver have declined steadily since the early 1980s, and gold began a gradual decline in the late 1980s.

## EMPLOYMENT IN THE MINERAL INDUSTRY

Combined employment in the four stages of the mineral industry (including coal mining) is estimated to have reached 401 400 in 2000, 3.7% above the revised 1999 level of 387 200. The mineral industry thus accounted for approximately 2.7% of the national employment level of 14.9 million (full and part-time) in 2000.

Employment in Stage 1 (metals and nonmetals, including structural materials and coal mining) increased for the first time since 1995. Employment was estimated at 54 000 in 2000, an increase of 1.2%

over 1999. Employment in metal mining increased by 2.1%, in nonmetal mining by 0.8%, and in structural materials by 6.5%, the latter reflecting continuing strength in construction activities. The closure of some coal mining operations led to a 7.8% drop in coal mine employment during 2000.

Employment levels for Stages 2, 3 and 4 were all higher in 2000 compared to the previous year. Employment in Stage 2 increased by 1.6% to 61 200, with gains in the smelting and refining sector offsetting decreases in the iron and steel sector. Stage 3 employment rose by 5.0% to 101 832 with gains in the semi-fabrication activities involving steel pipe and tube, aluminum and copper. Stage 4 employment in metallic mineral manufacturing increased by 4.3%. The strong North American economies contributed to these employment increases.

The level of employment in the sector that provides services incidental to mining, quarries or oil and gas wells increased by 12.4% to 45 647 in 2000. The sector provides drilling services, conducts exploration, and provides other services. In 2000, the number employed in diamond drilling related to mining was 1819, the same as in 1999. Because there is no establishment-based survey undertaken at this time by either Natural Resources Canada or Statistics Canada for Services Incidental to Mining, these numbers should be viewed with caution.

## MINERAL INDUSTRY TRADE

Canada is one of the world's largest exporters of minerals and metals, and 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 2000, the value of domestic exports of minerals and mineral products, including fuels, increased by 37.8% to \$98.9 billion from \$71.8 billion in 1999 (Table 2). The increase was largely due to a substantial increase in the value of mineral fuels. All four stages of production showed increases, with the largest increase being in Stage 3.

Again in 2000, the United States was by far the leading destination for Canada's minerals and mineral product exports (non-fuel, but including coal) of \$49.1 billion; it was the destination for 78.1% of domestic exports. Japan at 4.0% and the United Kingdom at 2.5% followed. The top 20 countries accounted for 97.2% of total domestic exports. Based on the four stages of production, exports to the United States accounted for 35.9% of Stage 1, 77.1% of Stage 2, 85.3% of Stage 3, and 92.2% of Stage 4.

The value of total domestic exports of metallic minerals and mineral products increased by 13.2% to \$37.9 billion in 2000, up from \$33.5 billion. On a

commodity basis, an increase in the value of exports was seen for aluminum (11.2%), copper (20.6%), iron and steel (12.6%), nickel (44.9%), and platinum group metals (67.6%). Uranium exports fell by 13.4% and gold exports declined by 7.9%. Two commodities, iron and steel and aluminum, accounted for 50.2% of these exports in 2000. The value of Stage 1 domestic exports for metallic commodities rose by 12.7% to \$3.6 billion. For individual commodities in Stage 1, domestic exports increased for copper (75.5%), platinum group metals (105.3%), iron and steel (14.4%), and aluminum (7.3%), while exports fell for lead (-24.0%) and gold (-19.6%). Three commodities (iron ore, aluminum and copper) represented 58.5% of all Stage 1 metallic exports.

The total value of domestic exports of nonmetallic minerals and mineral products rose to \$8.1 billion, up by 2.1% from \$7.9 billion in 1999. Gains were experienced in the value of exports of potash and potassium compounds (15.1%), sulphur and sulphur compounds (4.2%), and glass and glassware (3.9%). Exports that declined in 2000 were gypsum (-38.0%) and nitrogen (-2.2%). Potash and potassium compounds accounted for 30.0% of all nonmetallic exports.

Domestic exports of structural materials (now part of nonmetallic minerals) increased in value during 2000 to \$1.2 billion, an increase of 9.8% from \$1.1 billion in 1999. The value of cement exports, which accounted for 61.1% of total structural exports in 2000, rose by 1.5% to \$746.8 million. Gains were experienced by granite (12.8%), dolomite (33.1%), marble, travertine and other calcareous stones (45.6%), and other non-specified structural materials (46.1%).

Significant increases in domestic exports of petroleum and natural gas led to a value of \$51.6 billion in 2000 for fuel exports, an increase of 76.7% over 1999 as sharp price increases for these commodities were experienced during the year. Domestic exports of coal and coke declined by 11.0% in 2000 to \$1.8 billion. Petroleum accounted for 53.5% of total fuel exports with natural gas accounting for 39.0%.

The value of imports of mineral products, including fuels, increased by 25.4% from \$54.9 billion in 1999 to \$68.9 billion in 2000. Excluding fuels, but including coal, imports of mineral products amounted to \$50.7 billion with shipments from the United States accounting for 68.9% of this total. Mexico at 3.5%, China at 2.8% and Japan at 2.6% followed. The top 20 countries accounted for 93.7% of total imports. For the four stages of production, imports from the United States accounted for 65.6% of Stage 1 imports, 48.7% of Stage 2 imports, 65.5% of Stage 3 imports, and 73.8% of Stage 4 imports.

The total value of metal imports increased by 15.0% to \$41.2 billion in 2000 with increases in iron and steel (10.7%), aluminum (12.6%) and copper (101.8%)



leading the way. These three commodities accounted for 61.8% of all metals imports in 2000. For non-metals, imports were up by 10.4% to \$6.8 billion from \$6.2 billion in 1999, led by glassware (13.0%), phosphate and phosphate compounds (25.0%), and abrasives (6.3%). Graphite imports dropped by 6.8%. Glass and glassware accounted for 41.7% of all non-metal imports by value in 2000. The value of imports of structural materials in 2000 amounted to \$1.5 billion, an increase of 8.6% over \$1.4 billion the previous year. Clay and clay products, which accounted for two thirds of total structural imports in 2000, increased by 9.6% to \$979.5 million. Fuel imports were up by 67.6% as the value of petroleum imports rose by 76.9%. Petroleum accounted for 89.3% of total fuel imports in 2000.

Higher values of imports of mineral products, particularly from Stage 4, led to a negative balance of trade in 2000 of \$255.0 million. This compares to a positive balance of \$1.2 billion in 1999 and \$2.7 billion in 1998. For the total economy, the trade surplus rose to \$54.5 billion in 2000 from \$33.8 billion in 1999 and \$19.1 billion in 1998 as higher exports exceeded the increase in imports.

## INVESTMENT BY THE MINERAL INDUSTRY

Information on exploration expenditures and capital spending provides a useful indication of market conditions and of the view held by management and investors in the Canadian mining industry on future market conditions in relation to present productive capacity. In 2000, based on year-end valuations, 245 mining companies were listed on the Toronto Stock Exchange with a market capitalization of \$67 billion, compared to approximately 300 companies with capitalization of \$80 billion in 1999.

### Exploration Expenditures

Final exploration data for 1999 show that exploration and deposit appraisal expenditures amounted to \$504.3 million, compared to \$655.9 million in 1998. Preliminary estimates for 2000 indicate a decline to \$473.4 million. Company spending intentions for 2001 show a further drop to \$457.7 million. Exploration for palladium, diamonds and tantalum continue to be bright spots. Enhanced flow-through share incentives announced by the Government of Canada in late 2000 and additional incentives from the provinces and territories may help stimulate more interest in future exploration activities.

With the exception of Nunavut, Manitoba and New Brunswick, all provinces and territories experienced declines in exploration and deposit appraisal expenditures in 2000.

Mine complex development expenditures (including capital and repair expenditures) were \$3.0 billion in 1999. Preliminary figures for 2000 show an increase of 4.4% to \$3.1 billion. Company forecasts are estimated at \$3.3 billion in 2001, a rise of 6.4%. Ontario and Quebec are expected to have the largest expenditures in both years, although expenditures in the Northwest Territories have increased dramatically from \$88.9 million in 1999 to an anticipated \$324.7 million in 2000 and \$619.5 million in 2001.

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

Capital expenditures for construction and materials and equipment in the mining and mineral processing industries are estimated to reach \$7.1 billion in 2000, up from \$6.4 billion in 1999. Company spending intentions are expected to fall to \$5.9 billion in 2001. Capital expenditures for the mining and quarrying industry (Stage 1) are estimated at \$2.6 billion in 2000, up 6.8% from \$2.5 billion in 1999. A decline to \$2.4 billion is anticipated in 2001. Capital investment in the primary metals and mineral semi-fabricating industries (Stages 2 and 3) rose to \$3.5 billion in 2000, up from \$3.1 billion in 1999, an increase of 13.6%. In 2001, company spending intentions indicate a decline to \$2.6 billion. Fabricated metals (Stage 4) rose to \$924.9 million in 2000, up 10% from \$840.7 million in 1999, and a slight decline to \$918.9 million is indicated for 2001.

In 1999, capital investment in the total economy stood at \$171.3 billion. Estimates indicate an increase to \$179.9 billion in 2000 and \$183.1 billion in 2001. In 1999, investments in the mineral industry (Stages 1 to 4) accounted for 3.7% of the total capital expenditures in the Canadian economy. This is estimated at 3.9% in 2000 and it could fall to 3.2% in 2001. When repair expenditures to structures, machinery and equipment are included, expenditures in the mining and mineral processing industries totaled \$10.8 billion in 1999, the latest year for which repair data are available. The 1999 level represented 5.1% of the total capital and repair expenditures within the Canadian economy.

## HIGHLIGHTS IN THE CANADIAN MINING INDUSTRY

### Corporate Developments

Profits for the industry were markedly higher in 2000 due in large part to higher base-metal prices for most

of the year. Corporate operating profits for the mining industry increased by 122.8% to \$3.1 billion from \$1.4 billion in 1999. In 1998, profits were \$1.1 billion.

The formal decision to bring Canada's second diamond mine into production, the Diavik diamond project at Lac de Gras, located some 35 km southeast of the Ekati mine (Canada's first diamond mine), and 300 km north of Yellowknife in the Northwest Territories, was announced in December 2000. The project is a joint venture between Diavik Diamond Mines Inc. (DDMI), a wholly owned subsidiary of Rio Tinto plc, and Aber Diamond Mines Ltd., a wholly owned subsidiary of Aber Diamond Corporation. DDMI owns 60% of the project and is the project operator with Aber owning the remaining 40%. The positive production decision follows the receipt of a bankable feasibility report in May 2000 and brings into effect the environmental agreement with the Government of Canada, the Government of the Northwest Territories (GNWT), respective Aboriginal groups and DDMI; the socio-economic monitoring agreement between GNWT and DDMI; and participation agreements between Aboriginal groups and DDMI. The estimated \$1.3 billion project is now targeted to come into production in early 2003 based on a construction schedule commencing in early 2001. The current mining plan calls for four kimberlite pipes to be mined (A-154 South, A-154 North, A-418 and A-21), with production to come initially from surface mining and then move to underground mining for A-154 South and A-418 as these pits deepen. In mid-2000, total proven and probable reserves of the four pipes were estimated at 25.7 Mt with an average grade of 4.2 ct/t at a price of US\$74/ct. Aber has indicated its intentions to market its 40% share of Diavik production, including operating its own diamond sorting facility. As well, Aber has announced a business relationship with diamond manufacturer Overseas Diamonds N.V. and a marketing alliance with Tiffany & Co., which includes an agreement to sell the jeweller at least US\$50 million worth of diamonds annually over a 10-year period.

A potential third Canadian diamond mine made strong progress during 2000. Indeed, at year-end, DeBeers Canada Mining completed the acquisition of the Snap Lake project, a diamondiferous kimberlite dyke prospect, with the purchase of Aber Diamond Mines Ltd.'s 32.2% interest for \$173 million. Several months earlier, DeBeers acquired an initial 67.8% stake through the \$305 million takeover of Winspear Diamonds Inc. The project is located in the Camsell Lake region of the Northwest Territories, some 220 km northeast of Yellowknife. During 2000, pre-feasibility work continued as underground exploration and development moved the project further along towards a production decision. In April 2000, a pre-feasibility study indicated a mineable resource equivalent to 22 million recoverable carats with a

value of US\$118/ct, with capital costs estimated at \$269 million for a 3000-t/d underground operation. Later in July, Winspear announced an updated scoping study that recalculated the estimated recoverable diamonds to a depth of 750 m at 67 million ct. As well, at mid-year, the company confirmed an extension to the size of the dyke.

In May, North American Palladium Ltd. (NAP), Canada's only primary platinum group metals producer, embarked on a \$208 million expansion plan, buoyed by high prices for both palladium and platinum. The decision followed the expansion of resources and reserves of palladium and associated metals in 1999 and the receipt of a positive feasibility report to ramp up palladium production from the property. A new mill, rated at 15 000 t/d, was under construction and is scheduled to come on stream in mid-2001 to replace the existing 2400-t/d mill. Development of the expanded open pit to feed the concentrator was under way at mid-year. The company estimates that, beginning in 2002, it will produce 250 000 oz of palladium per year at a cash cost of US\$160/oz, making it the lowest-cost primary palladium producer in the world. NAP has announced that it now sells 100% of its palladium production to a major automotive manufacturer under a five-year contract. The purchase prices are at a minimum of US\$325/oz on 100% of production and a ceiling price of US\$550/oz on 50% of production, based on average monthly London Metal Exchange prices. There is no upper limit price on the other half of production.

Also in May, Breakwater Resources Ltd. acquired the Bouchard-Hébert and Langlois zinc mines from Cambior Inc. for \$48 million. The sale of the two mines, located in the Abitibi region of northwestern Quebec, was part of Cambior's financial restructuring plan, which was required to satisfy the significant losses incurred from gold hedging programs in 1999. When its restructuring program is completed, Cambior indicated that it will focus on gold mining as it has retained all of its core gold assets. With this new strategy, the company will be better able to develop its gold properties and to participate in the consolidation process expected in the gold sector.

Goldcorp Inc.'s new Red Lake gold mine began pouring gold in August, following settlement in April of a long-running strike that was settled with agreement by union members to decertify the union. Throughout the strike, development work continued and the company was successful in finding and outlining high-grade gold resources and reserves. Subsequently, the mine had its official opening in October with commercial production announced as of January 1, 2001. The underground mine and surface mill have a design production rate of 545 t/d and production in 2001 is forecast to be in excess of 300 000 oz. The company announced in January 2001 that reserves are now calculated at 1.8 Mt grading 1.69 oz/t with an inferred resource of 435 000 t

grading 2.02 oz/t using a price of US\$275/oz, thus making it one of the richest operating gold mines in the world.

In September, the Joint Review Panel of the Alberta Energy and Utilities Board and the Canadian Environmental Assessment Agency recommended that the Cheviot coal mine project in Alberta receive regulatory approval from the Government of Canada. The project, a joint venture between Luscar Coal Ltd. and CONSOL of Canada Inc., is located near Hinton and is expected to produce over 3 Mt of metallurgical coal for export markets. Although the Panel recommended that the project should proceed in 1997, a federal court directed that the Panel reconvene in early 2000 to hear additional evidence. By year-end, although a federal response to the Panel's recommendation had not yet been forthcoming, the Government of Alberta reissued a new mine permit for the project. Subsequently, in April 2001, the project received federal government acceptance.

In October, Noranda Magnesium, owned 100% by Noranda Inc., announced that the Magnolia magnesium plant, located at Danville, Quebec, had produced its first ingots of magnesium metal. The project, with an estimated cost of approximately \$840 million and owned 80% by Noranda Magnesium and 20% by Société générale de financement du Québec, is expected to begin commercial production in the second half of 2001. Its capacity is rated at 63 000 t/y of magnesium output using Noranda-developed technology to extract magnesium from serpentine mine tailings.

Major consolidation activities had an impact on the Canadian mineral industry in 2000. Rio Tinto plc became the major owner of the Iron Ore Company of Canada Limited (IOC) as a result of its acquisition of North Ltd., which owned 56.1% of IOC. Later in the year, Rio made an offer, through its wholly owned subsidiary, Rio Tinto Canada Inc., to buy all units of the Labrador Iron Ore Royalty Income Trust, the owner of 18.9% of IOC, and royalty and commission fees paid on IOC sales. The offer is estimated at approximately \$405 million. Mitsubishi Corporation owns the remaining 25% of IOC. Inco Limited was successful with its \$200 million offer to buy back its Class VBN shares that were issued as part of its purchase of the Voisey's Bay nickel-copper-cobalt deposit in Labrador in 1996. As a result, Inco now has total control over the deposit. Noranda Inc. announced late in 2000 that, as a result of additional purchases of Falconbridge Limited shares, its ownership of Falconbridge had reached approximately 55%, up from 49.9% at the end of 1999. Also in 2000, Teck Corporation increased its ownership in Cominco Ltd. to 50.1%, due in part to a general offer to Cominco shareholders. Billiton Copper Holdings Inc., a wholly owned subsidiary of Billiton plc, was the successful purchaser of Rio Algom Limited, paying approxi-

mately \$1.7 billion for the company in the latter part of 2000. The successful bid topped a lower bid by Noranda Inc.

The development of the Voisey's Bay nickel-copper-cobalt orebody was suspended in January 2000 as talks with the Government of Newfoundland and Labrador about a mining licence for the project officially broke down. The Government reiterated its position that all of the ore had to be processed in the province, whereas Inco would not commit to anything that might prove to be uneconomic. In early 2001, with a new premier in place for the provincial government and a new chief executive appointed for Inco, formal talks began between the Government of Newfoundland and Labrador and Inco on potential development of the project. The company is developing a special hydrometallurgical process that could be used to process the sulphide nickel ore found at Voisey's Bay. The process, still at the laboratory stage, would have to be tested as a pilot project. If successful, the process would allow Inco to process ore within the province and thus fulfill the province's key demand that the nickel be processed in Newfoundland before being shipped out of the province.

Other important events in 2000 included a strike by the Canadian Auto Workers Union (Mine/Mill Local 598) against the Sudbury operations of Falconbridge Limited, which began on August 1, 2000, idling four nickel-copper mines and mill and smelter operations. The nearly seven-month-long strike was settled in February 2001. Late in the year, Teck Corporation announced an agreement to sell its 50% ownership in the Niobec niobium mine in Quebec (50% owned by Cambior Inc.) to Mazarin Inc. for \$47 million. Mazarin has also agreed to purchase Teck's 25% interest in the Oka niobium project for \$3 million, subject to Niocan Inc.'s consent. In the last quarter of the year, Agnico-Eagle Mines Limited completed another expansion of the mill at its LaRonde gold mine, raising capacity to 4535 t/d. As a result of this increase in capacity, the company expects to be able to produce at a rate in excess of 300 000 oz of gold per year by the end of 2001.

## Industry and Government Initiatives

The Government of Canada, spearheaded by Natural Resources Canada, in conjunction with provincial governments, the territories and the mineral industry, has undertaken a number of activities to promote and support Canada's minerals and metals industry and mining-related equipment and services sectors. In 2000, these included:

- The announcement, in the 2000-2001 Budget, of the allocation of \$15 million over three years for the new Targeted Geoscience Initiative (TGI) to ensure that Canada's geological information infrastructure continues to be state-of-the-art to

stimulate new investment in mineral exploration. In collaboration with provincial and territorial geological surveys, TGI projects were initiated in nine provinces and the three territories.

- **Asian Trade Mission in January 2000:** The Minister of NRCan – accompanied by some 70 resource-based companies, three provincial ministers, and Aboriginal and municipal leaders – led a successful trade mission to China, South Korea and Japan. This mission laid the groundwork for the successful participation in the Prime Minister's Team Canada mission to China in February 2001.
- **European Mission in September 2000:** The Minister of NRCan led a departmental delegation to Brussels and Berlin to meet with decision-makers in the European Commission, the German government and the Canadian and European business communities. The visit signaled to the European Union (EU) the value that the Government of Canada places on the bilateral relationship, opened better channels of communication and information exchange, and laid the groundwork for more timely Canadian engagement in various EU legislative and regulatory processes.
- **Development of geographic information systems (GIS):** This will help northern and Aboriginal communities with the use of technology and developing data that will aid them in making decisions about their environment and economic resources.

In its 2000-2001 budget presented in March 2000, Quebec extended until December 31, 2001, the maximum 175% deduction of certain qualifying exploration expenses in certain locations for provincial tax purposes.

The Ontario Budget of May 2000 included initiatives that have an impact on mining activities in Ontario. The province is reducing the mining tax rate from 20% to 10% and enacting a 10-year tax holiday for new mines in remote areas aimed at promoting development in the Far North and in distant Aboriginal communities. As well, it is encouraging investment in mineral exploration by enacting a 30% tax deduction for Ontario residents who own flow-through shares for mineral exploration and reducing the corporate tax rate from 15.5% to 8.5%. In December the province indicated that it would harmonize its tax incentives with those of the federal government by offering a 5% refundable tax credit that, in dollar terms, is equivalent to the previously announced 30% tax deduction.

In July 2000, as a result of amendments to the federal *Income Tax Act*, British Columbia announced that the 20% refundable Mining Exploration Tax Credit to companies could be passed on to flow-through share investors retroactive to August 1, 1998.

In October, the Canadian Industrial Energy End-Use Data and Analysis Centre (CIEEDAC), an independent authority on industrial climate change performance, released information that, for the combined metal mining (less iron ore) and nonferrous metal smelting and refining sectors, energy consumption in 1998 was 13.5% less than 1990 levels and 1.2% less than 1997. With respect to greenhouse gas emissions, which include direct and indirect emissions, 1998 emissions for the same sectors were 16.4% less than 1990 levels and 8.8% less than 1997 levels.

In the Economic Statement and Budget Update of October 18, 2000, the Government of Canada proposed that a temporary 15% income tax credit be made available to individual investors who incur, either directly or through a partnership, exploration expenses pursuant to a flow-through share agreement. The expenses must be incurred by a corporation in the period after October 17, 2000, and before January 1, 2004, and must be for grassroots exploration conducted from or above surface.

On November 6, 2000, the Yukon announced that from April 1, 2001 to April 1, 2002, it would increase its refundable tax credit to companies from 22% to 25% of eligible mineral exploration expenditures.

In December, The Mining Association of Canada (MAC) announced the 1999 survey results for the Accelerated Reduction/Elimination of Toxic Substances (ARET) initiative, a voluntary program for individual Canadian companies. For the mining and metal processing companies that participate in this MAC survey, all ARET substances remain below the 1992 base-case levels and all, but possibly copper and arsenic, are expected to meet the original 50% target reduction by 2000. The reductions achieved to 1999 are arsenic, -49%; cadmium -71%; copper, -28%; hydrogen sulphide, -62%; lead, -73%; mercury, -93%; nickel, -78%; and zinc, -81%.

## PROFILES OF THE LEADING MINERALS PRODUCED IN CANADA

### Gold

Canada has long been one of the world's leading producers of gold. In 1999 (the latest year for which world data are available), Canada trailed only South Africa, the United States, Australia and China in the production of this precious metal. In 2000, Canada's gold output decreased from 157.6 t to 153.8 t, a decline of 2.4%. The value of gold shipments decreased by 2.6% to \$2.0 billion. The average price of gold improved slightly to US\$279.03/troy oz in 2000, but is still low by historical standards. The gold price closed out the year at US\$272.65/oz and, for the first part of 2001, is averaging about

US\$270/oz. Gold prices have been adversely affected by official sales of gold, although the 1999 *Washington Agreement*, under which European banks agreed to limit sales through 2004, has brought some stability to the market. Hedging, a general lack of investor interest, and a strong U.S. dollar have also weighed on the market. In an effort to reduce production costs, the relatively fragmented gold mining industry has been consolidating, and will continue to consolidate, with several mergers already announced and more expected.

Although Canadian gold production declined in 2000, employment increased to an estimated 8387, compared to just over 8200 in 1999. The 2000 employment level, however, remains lower than the recent peak of 10 100 in 1997.

## Copper

The volume of copper produced in Canada increased by 7.2% in 2000 to 623 500 t, an increase attributable to the re-opening of two mines temporarily closed in 1999. This amount was still below the 690 800 t produced in 1998. Copper prices fluctuated around US80¢/lb for the first half of the year, then rose, peaking to average nearly US89¢/lb in September. The average price for 2000 was US82.3¢/lb, an increase from the 1999 average of US\$71.3/lb. The price of copper has declined over the first half of this year and was trading at just over US70¢/lb.

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. World use is expected to increase by about 3% in 2001, down from over 6% in 2000, based on slower demand in western Europe and Asia, strong demand in Mexico, and a slower increase in copper use in the United States. A number of promising new applications for copper in the construction, transportation and electrical and electronics industries could provide significant growth opportunities.

## Zinc

Canada is the world's third largest producer of zinc, trailing China and Australia in 1999. 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. In 2000, zinc production (recoverable zinc in concentrates shipped) declined by 2.9% to 935 700 t. As older mines near closure, zinc production in Canada is expected to decrease further in 2001. Zinc prices averaged US\$51.2¢/lb in 2000, a

4.9% increase over 1999. Over the first six months of 2001, prices have averaged US\$44.3¢/lb. For 2001, the zinc market is expected to be in surplus for the Western World market.

## Nickel

Canada is the world's second largest nickel producer, behind Russia and ahead of Australia and New Caledonia. Nickel's resistance to corrosion, high strength, pleasing appearance and suitability as an alloying agent are characteristics that make it useful in many applications. Major markets include stainless steel (which uses about 65% of nickel production), nickel- and copper-based alloys, electroplating, alloy steels, and foundry products.

In 2000, nickel production in Canada increased by 2.4% over 1999 to 181 000 t. The value of nickel produced in 2000 rose dramatically by 48.1% to \$2.4 billion. Nickel prices averaged US\$3.92/lb in 2000, substantially above the 1999 average of US\$2.73/lb. The price was supported by increased stainless steel demand and lower-than-expected production from some Australian projects. For the first half of 2001, the price has retreated and averaged US\$3.00/lb for that period. Currently, the price is US\$2.76/lb. The global nickel industry is relatively small and is dominated by several large producers. This often leads to price volatility as large new projects come on stream or delays caused by unexpected technical problems curtail production. For the next few years the price is expected to average in the US\$2-\$4/lb range.

## Iron Ore

Iron ore production levels in Canada increased by 5.1% in 2000 to 35.7 Mt. The value of production increased by 9.6% to \$1.54 billion. Over 80% of the volume and 75% of the value of iron ore mine shipments are exported. The United States was the largest single customer, receiving 34% of the shipments in 2000. The EU was the recipient of 53% of shipments of Canadian iron ore in 2000.

The situation in the iron ore market improved substantially during the second half of 1999 and into 2000. Japanese steel production surged in the first half of 2000, resulting in increases in the Japanese iron ore reference prices with the price of fines rising by about 4.3% and the price of lump ore rising by about 5.8%. Pellet prices for European markets were up by just under 6%. Further price increases are forecast for 2001.

Another factor is aiding iron ore producers in their negotiations with major consumers. Iron ore freight rates have risen sharply, giving consumers less scope to seek better prices from producers farther afield.

## Uranium

Canada is the world's largest producer and supplier of uranium, exporting about 80% of its production. The United States is the largest market for Canadian uranium. The world's two largest uranium-producing companies have operations in Canada. Uranium production in Canada declined by 2.3% in 2000 to 9919 t. (Production is defined as the metal content [U] reported by producers of uranium precipitates or concentrates.) Despite this decline, uranium still ranks solidly among Canada's top 10 metal commodities in terms of value of production (in 2000, \$485.3 million). World uranium (U<sub>3</sub>O<sub>8</sub>) spot prices were quoted at US\$7.10/lb at the end of 2000, a significant decline from US\$9.90/lb at the beginning of the year. The price has since risen, averaging US\$7.72/lb for the first quarter of 2001.

## Potash

The term "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. Fertilizer use consumes over 90% of output. Other uses include detergents, ceramics, chemicals and pharmaceuticals. In 2000, potash was the third most valuable non-fuel mineral produced in Canada, trailing only nickel and gold. In 2000, the value of potash produced in Canada totaled \$1.71 billion, a 4.9% increase over 1999. The potash industry in Canada employed about 3400 workers in nine underground mines and two solution mining operations in Saskatchewan and in New Brunswick in 2000.

Canada is the world's largest potash exporter with a 43% share of international trade. Canada ships to some 40 countries but, in 2000, the United States purchased 58% of the total. Together with China (13%) and Brazil (8%), these three markets accounted for almost 80% of export sales.

Quoted prices for potash, f.o.b. Vancouver, were unchanged from 1999 at US\$110-\$129/t for standard grade and US\$128-\$132 for granular.

It is estimated that world potash deliveries will decline 7% to 23.5 Mt (K<sub>2</sub>O equivalent) in 2001 compared to 2000.

## Diamonds

In its first full year of production, Canada's only diamond mine produced 2.4 million ct valued at \$606.3 million. In 2000, the second year of operation, the Ekati mine in the Northwest Territories produced 2.6 million ct valued at \$638.2 million. A formal decision to bring Canada's second diamond mine into production, the Diavik diamond project at Lac de Gras,

located about 35 km from the Ekati mine, was announced in December 2000. The project is now targeted to come into production in early 2003, based on construction commencing in early 2001. A potential third mine, the Snap Lake project, also in the Northwest Territories, made strong progress in 2000.

Exploration for diamonds continued in several regions of Canada during 2000, although at a somewhat slower rate than in 1999. Preliminary data indicate that diamond exploration expenditures decreased from \$109 million in 1999 to about \$94 million in 2000. Exploration was focused principally in the Northwest Territories, but Ontario, Nunavut and Alberta also attracted significant diamond exploration activity, as did Saskatchewan, Manitoba and Quebec.

## OUTLOOK

The outlook for the Canadian mineral industry was unclear as 2001 began, although it was becoming more apparent that global economies were slowing down. This was particularly evident in the United States, where the economy grew at a weaker pace in the last three months of 2000 – a 1.1% annual rate as consumers reduced their spending and companies reacted to softening demand by curtailing investment activity and reducing high inventory stockpiles. Since the United States is a major market for Canadian metals and minerals, if this slowdown in growth continues into 2001 as is now expected, Canadian exports of these materials and the performance of Canadian producers will be negatively affected. Reflecting this slowdown in global activity, most major metal prices early in 2001 were at the low end of their range of the past 18 months, although Japanese reference prices for metallurgical coal, thermal coal and iron ore were higher.

Although steelmaking, a major user of metals and minerals, was holding up reasonably well in terms of production on a global basis, profitability was a major concern and more producer consolidations are likely. In North America, steelmaking had slowed noticeably in the last half of 2000, due in part to a reduction in automobile production and a large influx of steel imports that U.S. and Canadian steelmakers claimed were dumped or imported at subsidized prices. Formal trade actions to evaluate these allegations are under way. A continued reduction in steel production in the United States and Canada will have a negative impact on the Canadian minerals industry.

Most economists are forecasting Canadian GDP growth of about 2.1% in 2001, down from 4.7% in 2000. Inflation is expected to be at the upper limit of the Bank of Canada's 1-3% target range, with energy price pressures pervading the economy. The Bank of Canada reduced its bank rate by 0.25% to 5.75% in

January 2001, the first reduction in the rate since May 1999, indicating that the reduction was necessary taking into account the Canadian economic outlook and a reduction in the corresponding U.S. interest rate. Subsequently, further 0.25% decreases brought the Canadian bank rate down to 4.5% by the middle of 2001.

Globally, forecasters are looking at GDP growth of about 3% in 2001, down from 4.8% in 2000. A 3.8% growth rate is forecast for 2002. The United States is forecast to decline from 5% growth in 2000 to about 1.8% in 2001. Western Europe is expected to experience growth of about 2.3% in 2001 and South America about 2.9%, both figures lower than in 2000. Japan, after growing modestly by 1.5% in 2000, is forecast to show no growth in 2001. Growth rates in Southeast Asia should average about 3.5%, well below the rates achieved in 2000.

Canadian mining companies will continue to be under pressure to reduce costs in order to stay competitive in the global marketplace and to generate acceptable returns to investors. New mine development, other than for diamonds, will continue to be

weak. Exploration activity, with the exception of diamonds and platinum group metals, can be expected to be flat at best. Notwithstanding this, mining in Canada will continue to make a major contribution to the Canadian economy in 2001.

*Notes: (1) Information in this review was current as of August 31, 2001. (2) This and other reviews, including previous editions, are available on the Internet at [http://www.nrcan.gc.ca/mms/cmj/index\\_e.html](http://www.nrcan.gc.ca/mms/cmj/index_e.html).*

## NOTE TO READERS

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**TABLE 1. CANADA, PRODUCTION OF LEADING MINERALS, 1999 AND 2000<sup>p</sup>**

		Volume		Percent Change 2000/1999	Value		Percent Change 2000/1999
		1999 <sup>r</sup>	2000 <sup>p</sup>		1999 <sup>r</sup>	2000 <sup>p</sup>	
		(000 tonnes except where noted)		(\$ millions)			
<b>METALS</b>							
Gold	kg	157 617	153 781	-2.4	2 099	2 045	-2.6
Copper		582	623	7.2	1 366	1 688	23.5
Iron ore		33 990	35 707	5.1	1 406	1 541	9.6
Zinc		963	936	-2.9	1 540	1 567	1.7
Nickel		177	181	2.4	1 592	2 358	48.1
Uranium	tU	10 157	9 919	-2.3	526	485	-7.7
Silver	t	1 174	1 161	-1.1	295	277	-5.8
Platinum group	kg	13 872	15 439	11.3	250	464	85.5
Cobalt	t	2 014	2 013	0.0	112	101	-10.0
Lead		155	143	-7.9	116	96	-17.3
Molybdenum	t	6 250	6 833	9.3	60	64	8.1
<b>NONMETALS, INCLUDING STRUCTURAL MATERIALS</b>							
Potash (K <sub>2</sub> O)		8 475	9 107	7.5	1 634	1 714	4.9
Salt		12 686	11 935	-5.9	374	347	-7.3
Peat		1 180	1 194	1.2	164	168	2.4
Asbestos		337	320	-5.0	161	144	-10.6
Sulphur, elemental		8 656	8 515	-1.6	97	98	1.4
Sulphur in smelter gas		843	849	0.7	58	55	-5.8
Diamonds	000 carats	2 429	2 558	5.3	606	638	5.3
Gypsum		9 345	8 548	-8.5	107	96	-10.1
Nepheline syenite		676	703	4.0	57	61	5.6
Cement		12 634	12 612	-0.2	1 232	1 259	2.2
Sand and gravel		242 369	246 331	1.6	958	956	-0.2
Stone		109 184	112 348	2.9	775	822	6.0
Lime		2 565	2 547	-0.7	239	240	0.6
Clay products		..	..	..	165	175	6.5
<b>MINERAL FUELS</b>							
Petroleum, crude	000 m <sup>3</sup>	122 247	131 631	7.7	18 698	31 503	68.5
Natural gas	million m <sup>3</sup>	162 219	166 078	2.4	14 192	27 581	94.3
Coal		72 497	69 149	-4.6	1 474	1 315	-10.8
Natural gas by-products	000 m <sup>3</sup>	28 805	29 600	2.8	2 535	5 299	109.1

Sources: Natural Resources Canada; Statistics Canada, *Canada's Mineral Production, Preliminary Estimates*, 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 TO IV, 1996-2000**

	1996	1997	1998	1999	2000
			(\$000)		
<b>TOTAL MINING, INCLUDING FUELS</b>					
Domestic exports	67 867 537	71 497 524	68 382 983	71 790 654	98 893 225
Total exports	69 082 166	72 967 314	69 521 400	72 960 781	100 368 715
Imports	42 333 331	49 987 070	53 304 329	54 912 684	68 851 291
Balance of trade	26 748 835	22 980 244	16 217 071	18 048 097	31 517 424
<b>NON-FUEL MINING</b>					
Domestic exports	39 368 642	41 714 560	42 810 682	42 572 850	47 275 875
Total exports	40 078 786	42 544 308	43 799 223	43 600 825	48 585 507
Imports	31 494 434	37 138 246	42 501 584	43 360 799	49 488 897
Balance of trade	8 584 352	5 406 062	1 297 639	240 026	-903 390
<b>TOTAL NON-FUEL MINING, INCLUDING COAL</b>					
Domestic exports	41 989 016	44 449 130	45 333 223	44 617 186	49 096 321
Total exports	42 700 792	45 279 935	46 322 761	45 648 649	50 408 065
Imports	32 251 990	38 017 410	43 643 110	44 477 285	50 663 023
Balance of trade	10 448 802	7 262 525	2 679 651	1 171 364	-254 958
<b>TOTAL ECONOMY</b>					
Domestic exports	259 265 000	281 255 740	297 509 000	331 346 516	384 131 878
Total exports	275 773 600	299 089 922	322 517 000	360 608 800	417 657 600
Imports	232 648 033	277 751 100	303 420 400	326 820 900	363 163 500
Balance of trade	43 125 567	21 338 822	19 096 600	33 787 900	54 494 100

Sources: Natural Resources Canada; Statistics Canada.