

METAL MANIA: CANADA'S MINING BOOM

Introduction

Focus

This *News in Review* story examines the current economic boom for Canada's mining and mineral-production industries. Along the way we review the economic importance of the metal industries for Canada, meet some of the biggest players, and review the environmental impact of Canadian mining giants in the developing world. We also look at the special lure of that most beautiful of metals, gold. Finally, we give you the opportunity to explore a possible career in an industry where the sky seems to be the limit.

Definition

Venture capital refers to money that is invested and risked in new businesses or enterprises.

 Sections marked with this symbol indicate content suitable for younger viewers.

With the current focus on energy resources and the development of Alberta's oil sands, it can be easy to forget that Canada is also one of the world's greatest mining and mineral-producing countries. Hundreds of companies, large and small, are involved in mining and mineral production. Some of these, like Inco, Falconbridge and Barrick are giants with operations all around the globe.

Huge demand from emerging nations like China and India have recently begun to fuel the industry, creating a surge in prices for virtually every mineral Canada produces. As recently as the mid-1990s, minerals were considered some of the least rewarding of commodity investments. Today the industry can hardly keep up with demand.

At the recent Prospectors and Developers Association of Canada convention held in Toronto, the theme was "Mining's Back." More than 13 000 people attended. Tony Andrews, the Association's executive director, trumpeted the good news. "We're right on top of a big recovery right now, and Toronto has become the mining capital of the world," he said (*Toronto Star*, March 6, 2006). "All of the commodities are big. I can't think of one that hasn't been affected by the recent boom. Our industry's biggest challenge is supplying the demand over the next few decades."

Production Challenges

The biggest challenge for the industry will be to locate new deposits to satisfy demand, and billions of dollars will be spent on exploration activities. Last

year \$5-billion was spent world-wide, and \$1-billion was spent right here in Canada. The Toronto Stock Exchange raises more than half the venture capital that is spent on exploration and mining projects around the world.

A second major challenge is finding the people to do the work required. The industry estimates it will need at least 50 000 new employees over the next eight years. At the current rate, only 10 000 young people will choose mining and mineral production as a career. Even the fact that industry workers have some of the highest incomes in the country has failed to make these jobs more desirable.

Nevertheless, the industry is proceeding with optimism. Huge amounts have been invested in projects around the world and will have a significant impact on the economies of many developing countries. Whether that impact will be for good or ill has become a matter of some debate.

Environmental Challenges

Many of the mining projects require major landscape alteration and have a significant environmental impact. Huge tracts of land are turned into open pits; mountains are turned into molehills. Despite serious precautions and the best intentions, accidents do happen. Chemicals leach into waterways. Animal habitats are lost. The way of life of indigenous peoples is changed forever.

In some countries protests are taking place against the foreign companies who have come to work the land. Some of these companies are Canadian. The ultimate impact of these campaigns on the industry may not be known for years.

Emerging Trends

One of the more interesting trends in the mineral industry is featured in the video portion of this module—a massive increase in the recycling of metals. This means that almost all metals are now being recycled, and major Canadian firms are taking the lead. For example, Teck Cominco, one of the world’s largest zinc-mining companies, recently announced it was going to “mine” used computers and televisions for their metals. It hopes to recycle up to 20 000 tonnes of electronic equipment per year at one of its smelters. This particular recycling operation is

not expected to be profitable, but many others are. Thousands of Canadians are already involved in that growing part of the mining and mineral-production industry.

The mining industry tends to go in cycles, with high demand followed by slumps. Most experts are predicting, however, that this positive period should continue for many years. The price of both precious and base metals is on the rise, and investors are actively supporting the markets. The prospect of strong, long-term growth makes this an exciting time to work in the mining and mineral sector.

For Reflection

“The industry is desperate for people. But high school students don’t perceive mining as high-tech and sexy” (Laurelle LeVert, administration director, Lassonde Institute of Engineering Geoscience, University of Toronto, *Toronto Star*, March 12, 2006). When you think of mining and mineral production, what does it bring to mind? Is it all digging rocks? Can you see beyond that to other kinds of jobs that might be available in the industry? Draw up a list of the major pros and cons that you see for a mining career.

Mining Career Pros	Mining Career Cons

METAL MANIA: CANADA'S MINING BOOM

Video Review

Answer the questions in the spaces provided.

Quote

"If you're wondering why the mining industry chooses to meet in Canada every year . . . it's because this country is a key player."
— Havard Gould
CBC, accompanying *News in Review* video

1. What size of materials do metal recyclers look for?

2. What does Chris Boddy describe as "fool's gold"?

3. What term does Chris Boddy use to describe his occupation?

4. What is being created in China as a result of its economic boom?

5. According to Donald Coxe, what does one have when one has "indoor plumbing, electricity, basic appliances, and eventually a car"?

6. Why are so many people unaware of what is happening to the price of metals like zinc and copper?

7. How long is the current upturn in metal prices expected to last? _____
8. What was the last "boom" period for the metals industry? _____
9. Why was it such a good period for the industry?

10. About how many people each year join the middle class in China and India? _____
11. What is preventing the expansion of operations by several major mining companies?

12. In your opinion, how should Canada deal with the labour shortage facing the mining industry?

METAL MANIA: CANADA'S MINING BOOM

Gold: The Glitter

Further Research

One of many excellent Web sources of information on gold, gold prices, and gold as an investment is the Gold Information Network run by Austin Rare Coins Inc. at goldinfo.net. There is also information from the World Gold Council at www.gold.org.

Did you know . . .

Many "gold bugs" (long-term investors in gold) believe that the shiny metal is poised to rise to over a thousand dollars an ounce.

"Gold is pretty, but useless, mostly. We all know that the footnotes to history are chunky with pretty-but-useless and there we would send gold, except . . . gold has other tricks. It is also virtually indestructible and scarce and fiendishly difficult to find and to mine. So, like other beautiful and hard-to-get things, gold has come to convey status and power on those who win it." So wrote Marta Sali (*Detroit Free Press*, October 6, 2000) in an attempt to explain the continuing attraction of gold as an investment.

Gold has been a valued commodity for years and, in the 21st century, retains its place as the "King of Metals." Gold is one of the easiest metals to work with and to shape. Its use for making jewellery and ornaments dates back at least 6 000 years to ancient Sumer in the Middle East. Ancient Egypt turned gold into the basis of its wealth. Egyptian mines produced about 80 per cent of the ancient world's gold, and the Egyptians stored it in their treasury as gold wafers and bars. Goldsmiths were some of the most prized workers in the kingdom.

Around 550 BC, King Croesus of Lydia was responsible for the real beginnings of gold as a legal currency. A fabulously wealthy ruler, Croesus minted the first gold coins with a guaranteed exchange value. Unfortunately, Croesus was soon overthrown by Cyrus the Great of Persia—but he had begun a trend that would last until the 20th century.

The Gold Standard

Lots of things have served as money over the years—stones, shells, ivory,

wampum beads, furs—but the most favoured of all have been precious metals, and especially gold. Gold is durable but easily divisible, easy to handle, and has always had a high intrinsic value. Silver and copper also have played an important monetary historical role (especially as coins). But until fairly recently it was gold that set the standard for how much a country's money was actually worth.

When paper money was first introduced over 300 years ago, it was usually backed by reference to some standard commodity for which it could be exchanged on demand. In the latter part of the 19th century there was an international movement toward using gold as that commodity—so much so that by the beginning of the 20th century almost all countries had adopted it. In effect, this meant that a currency—such as the dollar—could be exchanged for gold at a fixed rate, and that a country guaranteed it had enough gold on deposit to make this exchange.

As a true monetary standard, the gold standard did not have a long history. The United States effectively brought it to an end in 1933 (during the Great Depression) by outlawing the private ownership of gold (except as jewellery). After the Second World War an international fixed exchange rate was created for the sale of gold by foreign governments to the U.S. Treasury, but this fixed rate was abolished in 1971. The price of gold was no longer directly linked to the value of the world's currencies. The values of both gold and currencies are determined by the financial markets.

Did you know . . .

Gold prices are usually given in U.S. dollars per ounce. An ounce is 28.349 grams.

What is Gold Worth?

Since the end of the gold standard, the value of gold on the open market has varied considerably from year to year. Like all other metal commodities, it has seen its ups and downs. At one point (January 1980) it was selling for US\$850 per ounce. By 1999 it was well under US\$300 per ounce.

However, the price trend since 2001 has been steadily upward. As March 2006 came to an end, the price of gold reached nearly US\$590 per ounce.

Most experts point to scarcity as the main reason for the increase in the value of gold. Most of the gold left to be mined is found in microscopic amounts in some of the poorest parts of the world. In these areas, mining enough gold (one ounce) for a ring requires companies to dig up and haul away about 27 tonnes of rock. This rock has to be pulverized and treated with diluted cyanide to separate rock from gold. The largest of these mines moves 450 000 tonnes per day.

The environmental impact of this kind of mining can be severe (See

“Environmental Costs,” on page 29). Developing countries like Ghana and Guatemala are the source of 70 per cent of the gold mining currently taking place. Mining companies say they are providing great jobs for local workers. Environmentalists claim that these firms—including major Canadian operations like Placer Dome in the Philippines—are getting away with practices that would not be tolerated in wealthier countries.

At the same time, the United States Federal Reserve, which holds the world’s largest gold reserves—over \$120-billion—has joined with most European central banks to severely restrict the amount of gold it sells. This helps keep prices high and makes it economical for companies to use expensive technology to extract the remaining gold deposits.

Most of the new gold—80 per cent of what is mined today—goes to the jewellery market in China and India, where demand increases almost exponentially every year.

For Discussion

What is gold worth to you? Does it have any special cultural significance for you and your family? Does your family invest in the gold market? Is gold or silver jewellery something you enjoy owning and wearing? Why or why not? Would you invest in gold? Why or why not?

METAL MANIA: CANADA'S MINING BOOM

Canadian Miners

Mining's Back

At the beginning of March 2006, Toronto was host city for the 74th annual Prospectors and Developers Association of Canada conference. More than 13 000 people attended this meeting, the theme of which was "Mining's Back." The number of participants is a clear indication of the importance of mining to the Canadian economy.

According to Global InfoMine (www.infomine.com/countries/canada.asp), there are at least 840 mining companies in Canada. Some of these are tiny, but others are giant corporations with interests around the world. The industry is a large player in the Canadian economy, contributing \$41.1-billion in 2003, 4.1 per cent of our Gross Domestic Product.

Here are brief profiles of some of the major players and one relative newcomer to the industry.

Barrick

In March 2006 Barrick (www.barrick.com) completed its acquisition of Placer Dome and became the world's largest gold producer. It operates 26 mines in 10 countries, and exploration and development projects in several other countries. It also has the largest gold reserves in the industry.

Barrick also is a large producer of copper. Its projections for 2006 include 8.6 to 8.9 million ounces of gold, and approximately 350 million pounds of copper. Projected costs of gold production are \$275-\$290 per ounce. With gold currently (March 2006) selling at over \$580 an ounce, the profit margin seems excellent.

Inco

In addition to being the world's second-largest producer of nickel, Inco Ltd. (www.inco.com) also produces copper, cobalt, and platinum. The company has a market share of global nickel sales of approximately 20 per cent.

Inco's main Canadian production facilities are in Thompson, Manitoba, and Sudbury, Ontario. The company

employs over 6 000 people. Inco is also the sole owner of the Voisey's Bay Nickel Company (www.vbnc.com) in Newfoundland and Labrador. It anticipates investing \$3-billion in mining and processing Voisey's Bay nickel over the life of the project. Inco's production facility in Indonesia employs another 3 010 people.

Teck Cominco

Teck Cominco (www.teckcominco.com) bills itself as a "a world leader in the production of metallurgical coal and zinc, in addition to being a major producer of copper and gold." Metallurgical coal describes the various grades of coal suitable for making steel. The company's investments in metallurgical coal meant clear profits even in years when the market for base metals and precious metals was depressed.

The company is actively involved in exploration, with offices in nine countries. Its 2005 net earnings were \$1.3-billion.

Falconbridge

The current incarnation of Falconbridge Limited (www.falconbridge.com) is the result of the 2005 merger of two huge companies, Falconbridge Limited and Noranda Inc. The new company is a major producer in several areas: copper, nickel, zinc, and aluminum. It is the world's eighth largest producer of copper, fourth largest of nickel, and third largest of zinc.

The company is also "one of the world's largest recyclers and processors of metal-bearing materials." The company employs about 14 500 in locations in 18 countries. Its growth strategy is to

Did you know . . .

To many observers, Canada's major mining companies represent very attractive takeover targets for companies in the U.S., Europe, and Asia.

discover, acquire, and develop nickel and copper deposits around the world.

Cameco

Cameco (www.cameco.com) is the world's largest supplier of uranium—about 20 per cent of demand. Its major holdings are high-grade mines—the world's largest—in northern Saskatchewan. It also obtains uranium through U.S. subsidiaries in Wyoming and Nebraska. Cameco spends about \$24-million annually on uranium exploration, mostly in Canada and Australia.

Cameco also owns Canada's only uranium refining facilities, including the world's largest, in Blind River, Ontario. A second Ontario plant manufactures fuel rods for CANDU reactors. Cameco is also involved in the generation of electricity as a partner in Bruce Power, which operates nuclear reactors in Ontario.

Follow-Up Activity

All of the five major Canadian companies profiled above seem to share some characteristics. In your notebook, make a list of four or five of these that seem especially suited to ensuring corporate success. Compare this list with those of your classmates.

Breakwater is a smaller, but an ambitious company. From its description, would you say it is on the right track? Why? Explain fully.

Breakwater

Breakwater Resources Ltd.

(www.breakwater.ca) “is a mineral resource company engaged in the acquisition, exploration, development, and mining of base metal and precious metal deposits in the Americas.” Breakwater currently has three producing zinc mines: one in British Columbia, a second in Honduras, and a third in Chile. A fourth mine is being developed in Quebec and is expected to begin production in 2007.

Breakwater's immediate plans, including exploration, are limited to the four sites it currently operates or is preparing for operation. Exploration on other Breakwater projects is being carried out by other companies. These thus earn an interest in any successful future developments at those sites.

METAL MANIA: CANADA'S MINING BOOM

Economic Impact

Definition

The *Gross Domestic Product* is the value of all the goods produced and services provided in a country, but excludes transactions with other countries.

Further Research

Information in this section comes from Natural Resources Canada at http://mmsd1.mms.nrcan.gc.ca/mmsd/facts/canFact_e.asp?regionId=12.

How important are the mining and metal industries to Canada's economy? In 2003, mining and mineral processing were responsible for 4.1 per cent of Canada's Gross Domestic Product, for a total of \$41.1-billion. Here are some other facts and figures that describe their important role.

Mineral Production

The four minerals of highest value produced in Canada (2002) are:

1. Gold (\$2.3-billion)
2. Nickel (\$1.9-billion)
3. Potash (\$1.6-billion)
4. Copper (\$1.4-billion)

In terms of world rank in overall production of specific minerals, Canada is:

- first in the production of uranium and potash
- third in the production of primary aluminum (Canadian aluminum is made from bauxite and alumina imported from other countries)
- in the top five for all of the following: nickel, asbestos, zinc, cadmium, titanium concentrate, platinum group metals, salt, molybdenum, copper, gypsum, cobalt, and diamonds

The total value (2003) of metals produced in Canada was \$20.2-billion. These were produced by:

- 190 principal metal, non-metal and coal mines
- 50 smelters, refineries, and steel mills

Mining and Mineral Employment

In 2003, 389 000 Canadians were directly employed in the mining and mineral-processing industries. Of these 389 000:

- 47 000 worked in mining
- 59 000 worked in smelting and refining
- 283 000 worked in manufacturing mineral products

The average weekly income in this sector (2003) was over \$1 000; and this average has continued to climb. It is one of the highest industry averages in Canada.

Women work in all areas of the mining and mineral production sector. The Women's Association of the Mining Industry of Canada will celebrate its 85th anniversary in 2006.

Every job created in the mining and mineral production industry means at least one other job is indirectly created in another sector of the Canadian economy.

International Trade

About 80 per cent of Canada's annual mineral production is exported to other countries. In 2001, minerals and mineral products accounted for 12.6 per cent of total Canadian exports. Canada, the world's largest producer of uranium, exports 85 per cent of that production to other countries. Its chief customers are Japan, Europe, and the United States.

In volume, more than 65 per cent of all products loaded at Canadian ports for international trade are mineral-related.

Recycling Minerals

It is estimated that 10 million tonnes of metals, valued at \$3-billion, are recycled annually in Canada.

There are over 3 000 companies with over 20 000 employees involved in metal recycling in Canada.

Canada imports and exports about 5.2 million tonnes of recycled metals per year. Eighty-five per cent of this trade is with the United States.

Land Use

Canada's total land area is 1.01 billion hectares. Of this total, fewer than 0.4 million hectares are used by mining operations. Since mining began in Canada, only 0.03 per cent of the country's land has been used for mining.

Review Quiz: Your Knowledge

1. What is the most valuable mineral produced in Canada? _____

2. In the production of two minerals, Canada is the world leader. What are they?
1. _____ 2. _____

3. What was the total value of all minerals produced in Canada in 2003?

4. What was the average weekly salary in 2003 of a worker in the mining and mineral industries?

5. What percentage of Canada's mineral production is exported to other countries? _____%

METAL MANIA: CANADA'S MINING BOOM

Environmental Costs

“This month a Philippine province sued the world’s fifth-largest gold company, Canada-based Placer Dome, charging that it had ruined a river, bay, and coral reef by dumping enough waste to fill a convoy of trucks that would circle the globe three times. Placer Dome, which also runs three major mines in Nevada, answered by saying that it had ‘contained the problem’ and already spent \$70-million in remediation and another \$1.5-million in compensation” (*The New York Times*, October 24, 2005).

That there are environmental costs associated with mining is a well-known fact. The devastation caused by open pit mining is especially notorious (for a brief overview of this method see www.digistar.mb.ca/minsci/surf/openpit.htm.) This type of mining permanently alters the terrain and the ecosystem in which it takes place.

In Canada . . .

In Canada, almost all mining, no matter what the method, includes plans for landscape restoration and remediation once the mining in a particular area has been completed. In fact, according to the Natural Resources Canada Web site (http://mmsd1.mms.nrcan.gc.ca/mmsd/facts/canFact_e.asp?regionId=12), “Today mining represents a temporary land use, disrupting relatively small areas of land for a specific (usually short) period of time. Once the ore deposit is depleted, the land is reclaimed for other uses, including recreation.”

Many of Canada’s mining operations are monitored on a routine basis. For example, Environment Canada’s Metal

Mining Effluent Regulations require mine operators to regularly monitor aquatic systems for negative effects caused by mining effluent.

While Canadian law and regulations help ensure good mining practices in this country, all is not necessarily rosy elsewhere. As the Philippine lawsuit against Placer Dome demonstrates other countries may not be as fortunate.

. . . and Elsewhere

In 2005, *New York Times* reporters spent several months studying mining—especially gold mining—in the Americas, Africa, and Europe, and came to some alarming conclusions. “Some metal mines, including gold mines, have become the near-equivalent of nuclear waste dumps that must be tended in perpetuity. Hard-rock mining generates more toxic waste than any other industry in the United States, according to the Environmental Protection Agency. The agency estimated last year that the cost of cleaning up metal mines could reach \$54-billion” (*The New York Times*, October 24, 2005).

The situation is even more problematic in poorer countries. As ore deposits become depleted in rich countries, and their mining practices come under more intense scrutiny, prospecting and mining efforts increasingly shift to developing countries.

The *Times* points to a huge mine in northern Peru at Yanacocha run by Newmont, the world’s largest gold-mining company. What were once rolling green hills have been blasted and reassembled into bare mountains of ore. These mountains are lined with hoses that trickle water laced with

cyanide over the rock to separate it from the gold—a process that goes on for years. This process, called cyanide heap leaching, is considered to be the most cost-effective way of obtaining tiny bits of gold from ore.

Unfortunately, there is another major product of this type of mining. All the newly exposed rock contains sulfites; when this is exposed to the air it forms sulfuric acid. Not only is the sulfuric acid itself a pollutant, it also releases heavy metals—cadmium, lead, mercury—which are extremely dangerous even in low quantities. The environmental problems can persist for years, even when basic remediation procedures, such as covering over the exposed rock piles, are performed. (Newmont has information on cyanide management and its approach to it at www.newmont.com/en/social/cyanide/index.asp.)

The World Bank has as its mission “to fight poverty with passion and professionalism for lasting results—to help people help themselves and their environment by providing resources, sharing knowledge, building capacity and forging partnerships in the public and private sectors” (www.worldbank.org). It has been a leader in bringing international mining companies to countries with little else to offer but their natural resources.

In 2004 the bank completed a reassessment of its investment policies toward mining corporations. Its first new investment upon completion of the study was in Guatemala. The beneficiary was a major Canadian gold mining company, Glamis Gold Corp. Glamis is based in Reno, Nevada, but listed on the Toronto Stock Exchange.

The plans for the mine, officially known as the Marlin project, have led to huge local opposition. An American hydrologist reviewed the mine’s environmental impact statement, and found it lacking. The two main areas: a failure to address the large quantities of water it will use, and insufficient information on the large quantities of waste it will produce.

A non-binding referendum was held in which the local villagers voted virtually unanimously against the mine. Villagers set up roadblocks to prevent mine equipment from moving into the area, and at least one person was killed and several others injured in clashes with police.

Glamis—with a \$45-million investment from the World Bank—has continued with the project, and is predicting success and large profits. Visit the Glamis Web site at www.glamis.com for an extensive presentation, with photographs, of the work taking place at Marlin.

For Discussion

1. When a dispute arises between indigenous peoples and a mining company, who bears the ultimate responsibility for its resolution? Is it the company exploiting the area or the government that invited it to do so? What should be the company’s response to local pressure?
2. Is it realistic to expect an international corporation to meet the same environmental standards in both wealthy and developing countries? Are there reasons why some exemptions might be given?

METAL MANIA: CANADA'S MINING BOOM

A Career in Mining and Minerals

One theme that repeated over and over at this year's Prospectors and Developers Conference in Toronto was the industry's shortage of younger workers. Here are some facts:

The total mining workforce in Canada is 87 700. Of this number, 57 000 are expected to retire by 2014, when the mining industry will require a workforce of at least 90 000. It is estimated that there will be fewer than 10 000 younger workers headed into the industry to replace the retirees.

Meanwhile, weekly earnings for mining employees are second only to those of oil and gas workers. Patricia Dillon, president of the prospectors association, (quoted in the *Toronto Star*, March 12, 2006) recognizes the problem. "We're trying to get more youth to consider a career in this industry. People don't understand that we are a very high-tech sector and a very high-paying industry."

Laurelle LeVert, administration director at the University of Toronto's Lassonde Institute of Engineering Geoscience, also laments the way in which younger people view the mining industry (also in the March 12, 2006, *Toronto Star*): "The industry is desperate for people. But high school students don't perceive mining as high-tech and sexy." Lassonde has 80 students enrolled over its four-year program. According to LeVert, their future is assured. "All of my graduates have their pick of places to work. We can't turn out enough of them to satisfy the industry."

Jobs in the industry are—and will continue to be—available at all levels, and the industry is attempting to recruit all kinds of people, including those less traditionally associated with mining, such as women, Aboriginal Canadians, and new Canadians.

Here is your opportunity to explore a career in mining and minerals. The five Web sites listed below provide information on a wide variety of mining careers. You may wish to supplement these with additional information provided by your school's guidance or careers counsellor. Use the information to fill out the worksheet on page 32. Be prepared to share the results of your research.

1. Natural Resources Canada: Careers in the Mining Industry (www.nrcan.gc.ca/mms/scho-ecol/jobs/car_e.htm) — A brief introduction to several careers
2. Canadian Institute of Mining, Metallurgy and Petroleum (www.cim.org/minerals/careers.cfm)
3. Minerals Council of Australia (www.minerals.org.au/careers/) — Video/photograph presentations of 30 different careers
4. "Careers in Mining: A Handbook Compiled by the Muskoka Nipissing Parry Sound Local Training and Adjustment Board" (www.exploretetrades.ca/documents/Mining_Handbook.pdf) — A 73-page booklet in PDF format
5. Ontario Mining Association: "Rock On! Career Opportunities in Ontario's Mining Industry" (www.rock-on.ca)

Mining and Mineral Careers Worksheet

Name: _____

Career Title: _____

Job Description

Skills Required

Working Conditions

Education/Training

Salary Expectations

Additional Comments

My Remaining Questions
