

QUEBEC'S

# MINERAL INDUSTRY CLUSTER

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SOCIO-ECONOMIC  
CONTRIBUTION TO  
THE DEVELOPMENT  
OF QUEBEC  
AND ITS REGIONS

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2010



Association minière  
du Québec

**AEMQ**  
ASSOCIATION DE  
L'EXPLORATION MINIERE  
DU QUÉBEC

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## MESSAGE FROM THE PRESIDENTS

*The Québec Mining Association and the Québec Mineral Exploration Association asked E&B Data to assess the socio-economic and tax impact of Quebec's mining industry cluster. We felt it was important to update the industry's overall profile, from exploration and mining to primary processing.*

*We are pleased to present the results of this study. We hope it will meet your expectations and give you a better understanding of the mineral industry cluster in Quebec.*

*Good reading.*



**MICHEL LECLERC**  
CHAIRMAN OF  
THE BOARD

Québec Mining  
Association



**GHISLAIN POIRIER**  
PRESIDENT

Québec Mineral  
Exploration Association

**E&B DATA**  
ebdata.com

Founded in 1998, E&B (Economic & Business) DATA is a consulting firm providing information products in economics, business metrics and valuation of established and emerging industrial sectors. E&B DATA specializes its research in business location factors, impact studies and wealth creation conditions.

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**QUEBEC'S MINERAL INDUSTRY CLUSTER MAKES A SUBSTANTIAL CONTRIBUTION TO THE QUEBEC ECONOMY:**

- A contribution of nearly \$7 billion to the GDP (2007), equivalent to 2.4% of Quebec GDP;
- More than 52,000 jobs (full-time equivalent), including 36,000 direct jobs and 16,000 jobs (full-time equivalent) in the Quebec supplier<sup>1</sup> network (2006);
- Wages estimated at \$1.9 billion (2008), excluding suppliers' employees, with wages 42% higher than the average wage in Quebec.

**THE TAXES PAID BY THE INDUSTRY MORE THAN MAKE UP FOR THE PUBLIC SECTOR'S TAX SUPPORT:**

- Average annual net tax revenues of \$281 million for the Quebec government since 2000, in addition to those generated by investment activities and corporate taxes;
- The Quebec government's tax incentives have contributed to the opening of 10 new mines in Quebec since 2000;
- \$8 billion in total exports (raw and processed metals and minerals) in 2008, with average annual growth of 8.2% since 2000.

**ALTHOUGH THE QUEBEC MINERAL INDUSTRY CLUSTER WAS AFFECTED BY THE GLOBAL FINANCIAL CRISIS, RECOVERY IS ALREADY WELL UNDER WAY:**

- A 36% increase in the value of exports between the low point in January 2009 and July 2009, greater than that for exports of goods as a whole;
- 10 capital projects announced (including nine major projects of \$200 million or more per project), for a total of approximately \$4 billion.

**AS WELL, A REGIONAL INNOVATION SYSTEM INTEGRATING PRIVATE AND PUBLIC INITIATIVES CONTRIBUTES TO:**

- *technological* breakthroughs in fields such as hydrogen-fuelled underground vehicles, blasting platforms, or fragmentation or chemical dissolution (lixiviation) technologies that are innovative in terms of their cost and reduced environmental impact;
- *commercial* breakthroughs, as evidenced by the growth in equipment manufacturers' exports (14% annual growth rate in the value of exports since 2000).

On the regional level, the industry contributes to communities through targeted initiatives that involve more than 1,000 local non-profit organizations, in addition to contributing to the development of a network of more than 3,800 suppliers in Quebec, 1,800 of which are located in the Montreal region.

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<sup>1</sup>Source: Statistics Canada, Catalogue n° 26-223-X, Metal ore mining, 2006; Catalogue n° 26-226-X, Non-metallic mineral mining and quarrying, 2006; Catalogue no. 72-002-X, Jobs, earnings and hours, December 2007. Institut de la statistique du Québec, 2004 multipliers.

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This study was conducted by examining a body of primary data (survey and interviews) and secondary data (existing statistics) in order to compile an updated portrait of the industry. The Statistics Canada statistical system was selected because it uses the same conventions for all sectors and thus allows for aggregations and comparisons that would not otherwise be possible.

## INDUSTRY STRUCTURE

The government system of statistical information divides the different activities in the mineral industry cluster into three categories: exploration, mining and quarrying, and processing. While the activities of each of the categories are relatively well documented, the statistical portrait of the entire mineral industry cluster has yet to be established. The following definitions served as the basis for the analysis:

- **EXPLORATION**<sup>2</sup> includes activities that support mining (mines and quarries), excluding oil and gas. They are primarily prospecting activities, sampling (e.g. drilling) and activities leading to the development of a mine complex.
- **MINING AND QUARRYING** of metallic ore (e.g. gold, iron, copper, nickel, zinc, titanium, niobium) and non-metallic minerals<sup>3</sup> (e.g. cement, stone, salt) includes processing and enrichment. This includes plants that process these minerals, whether or not they are located near the mine sites.
- **PROCESSING**<sup>4</sup> of minerals includes the non-metallic mineral products manufacturing sector<sup>5</sup> and some sub-sectors of the primary metals manufacturing industry<sup>6</sup>, excluding those activities not based on mineral resources mined in Quebec (e.g. bauxite).

This analysis focuses on the processing chain for Quebec minerals, from exploration to their processing in Quebec. The observation unit is employment (direct and indirect jobs) as well as business *establishments* whose main activity comprises the above-mentioned operations.

## LIMITS

Using the Statistics Canada system does have some limits with respect to the age of the most recent data. As well, some components of the industry present major hurdles when it comes to measuring their level of activity. This is the case with mining exploration, where several constraints and difficulties of a practical nature were encountered in estimating employment levels (e.g. estimating jobs in terms of person-years in an industry where contract work is widespread; temporary nature of establishments). Moreover, many contacts with mining exploration firms indicated that Statistics Canada may have underestimated the number of jobs. On the specific point of jobs in the exploration sector, E&B DATA believes that there may be a high margin of error in the official statistics, without affecting the orders of magnitude presented in this document for the overall mineral industry cluster.

<sup>2</sup>NAICS 213 (Support activities for mining and oil and gas extraction). NAICS: North American Industry Classification System, the coding system for economic activity used by Statistics Canada.

<sup>3</sup>NAICS 2122 (Metal ore mining) and 2123 (Non-metallic mineral mining and quarrying). Crushing, grinding, cleaning, drying, agglomeration, calcination, chemical dissolution, gravity separation or flotation operations.

<sup>4</sup>NAICS 327 (Non-metallic mineral product manufacturing), NAICS 3311 (Iron and steel mills and ferroalloy manufacturing), NAICS 3314 (Non-ferrous metal (except aluminum) production and processing), and NAICS 3315 (Foundries).

<sup>5</sup>The manufacturing of non-metallic mineral products comprises establishments involved in the cutting, grinding, shaping and finishing of granite, marble, limestone, slate and other stone. The sector also includes establishments that prepare non-metallic minerals (mixing, firing) to manufacture such products as bricks, ceramics, cement and glass.

<sup>6</sup>The manufacturing sub-sectors for primary metals considered for this study include: a) metallurgy (cast iron and processing of pig iron into steel for the production of simple forms of iron and steel), b) production and processing of non-ferrous metals (except aluminum) and c) foundries (pouring molten metal into moulds to manufacture parts, excluding forging and stamping).

# JOBS

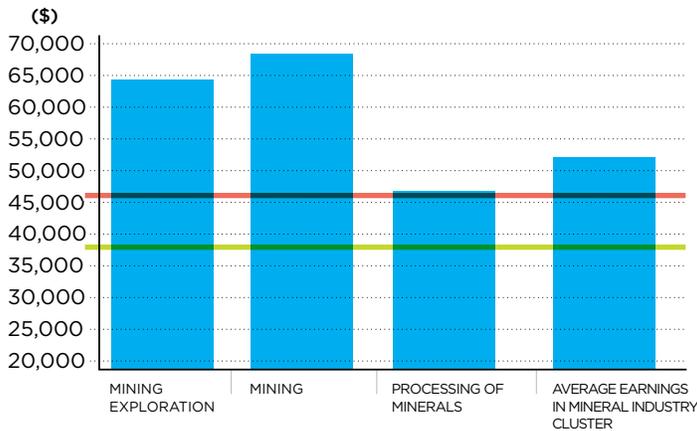
## REASONS FOR THIS ANALYSIS

The level of employment is an important indicator of activity in an industry. This indicator is even more revealing when examining the entire value chain in an industry cluster and reviewing workers' earnings. As well, the importance of an industry in a given territory is not measured solely by the "direct" activity of industry establishments, but also by that of local suppliers, i.e. those operating in Quebec. So-called "indirect" jobs (measured in terms of full-time equivalent) generated by the supplier network are a measure of this activity. Different techniques can be used to estimate this impact, either analyzing accounts payable of companies in the industry cluster or using inter-industry (input-output) modeling techniques.



## CONCLUSIONS FOR QUEBEC

### AVERAGE ANNUAL WAGE OF WORKERS IN THE MINERAL INDUSTRY QUEBEC- 2006<sup>7</sup>



**Average annual wage in sector 11-33**  
(Manufacturing, processing of raw materials, public services, excluding construction)

**Average annual wage, Quebec economy**

There are 1,376 business establishments in Quebec's mineral industry cluster: 280 in exploration, 192 in mining and quarrying, and 904 in processing (2006).

In total, the mineral industry cluster generates a little more than 52,000 direct and indirect jobs (full-time equivalent)<sup>8</sup> in Quebec, with 6% in exploration, 26% in mining and quarrying, and 68% in processing.

Of these 52,000 jobs, more than 36,000 are direct jobs<sup>9</sup> based on the most recent statistics (2006) and approximately 16,000 (full-time equivalent) in the supplier network<sup>10</sup>.

With regard to direct jobs, while there are relatively few jobs upstream (2,000 people in exploration<sup>11</sup>), job numbers are larger downstream (9,200 in mining and quarrying, and 25,100 in processing). This corresponds to estimated total workers' wages of \$1.9 billion (2008).

In relative terms, the average income of direct workers in the mineral industry cluster was \$53,000 in 2006, which is 16% higher than in the manufacturing sector (\$45,100) and 42% higher than in the Quebec economy overall (average of \$37,400). For all of the industry cluster's sub-sectors, average incomes exceed the average for the primary and secondary sectors, i.e. 43% higher for mining exploration at \$64,400, 51% for mining and quarrying at \$68,400 and 3% for processing at \$46,500<sup>12</sup>.

For the jobs generated by the mineral industry cluster in the Quebec supplier network, most of them (10,399, or 66% of jobs with suppliers) are in processing, 28% (4,445) in mining and quarrying, and 6% (900) in exploration.

<sup>7</sup>Source: Statistics Canada, Catalogue n° 26-223-X, Metal ore mining, 2006; Catalogue n° 26-226-X, Non-metallic mineral mining and quarrying, 2006; Catalogue n° 72-002-X Employment, earnings and hours, December 2007. Based on average weekly earnings of all workers (production workers and related workers) including overtime and salaries and wages for the metal and non-metallic sectors. Average annual earnings are weighted by the number of jobs.

<sup>8</sup>Sources: Statistics Canada, Catalogue n° 26-223-X, Metal ore mining; Catalogue n° 26-226-X, Non-metallic mineral mining and quarrying; Catalogue n° 72-002-X, Employment, earnings and hours, December 2007.

<sup>9</sup>Sources: Statistics Canada, Catalogue n° 26-223-X, Catalogue n° 26-226-X, Catalogue n° 72-002-X, 2006.

<sup>10</sup>E&B Data estimate, based on impact multipliers from Institut de la statistique du Québec, 2004. Double counting taken into consideration.

<sup>11</sup>See Approach on the question of jobs in exploration. The industry estimates that this figure is lower than the actual figure. The inter-industry tables used by E&B Data are based on the structure of the Quebec industry in the early 2000s and cannot therefore reflect the strong trend to outsourcing in this industry over the past decade.

<sup>12</sup>These figures are based on average weekly earnings for all workers (production workers and related workers) including overtime. Average annual earnings are weighted by the number of jobs.



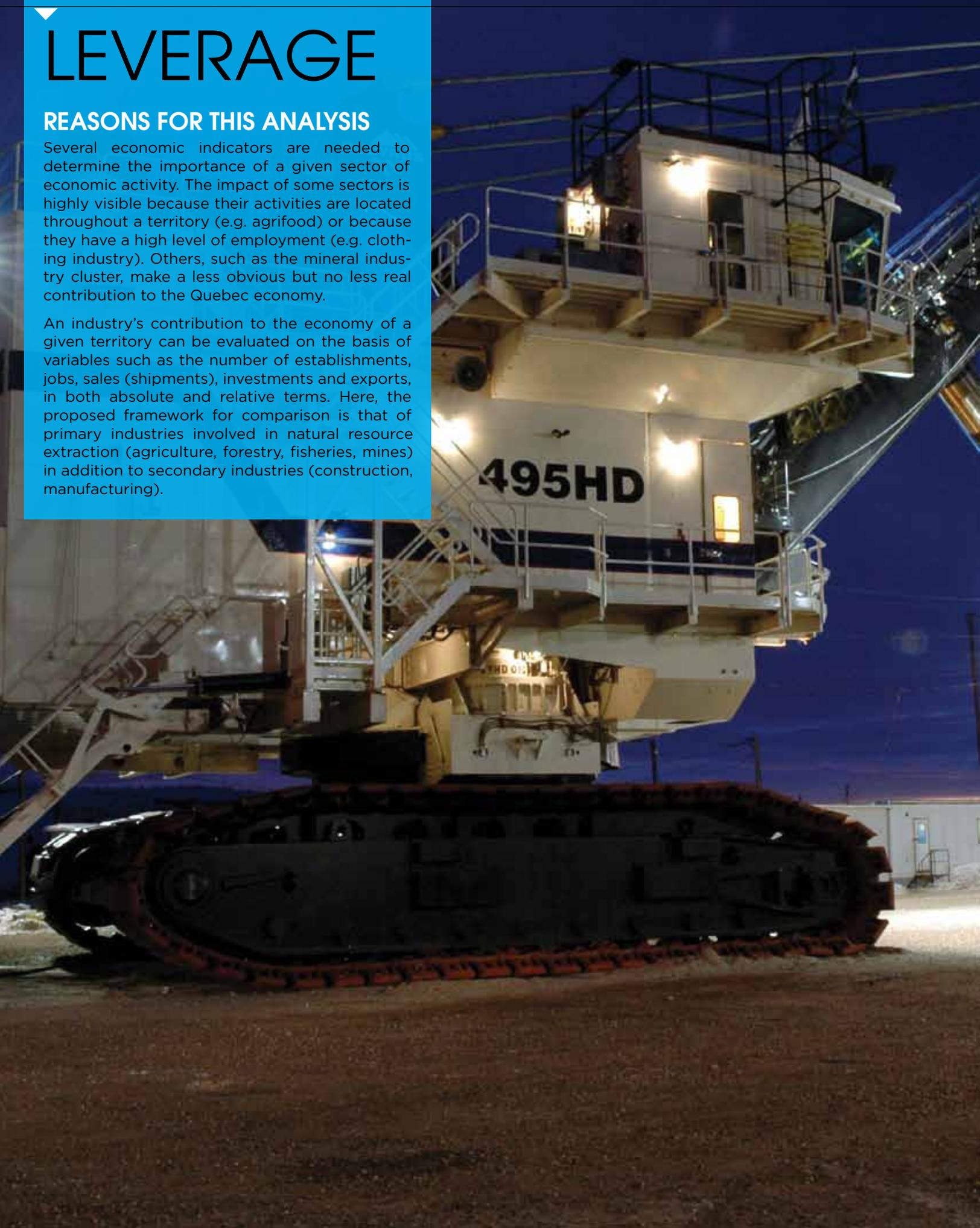


# LEVERAGE

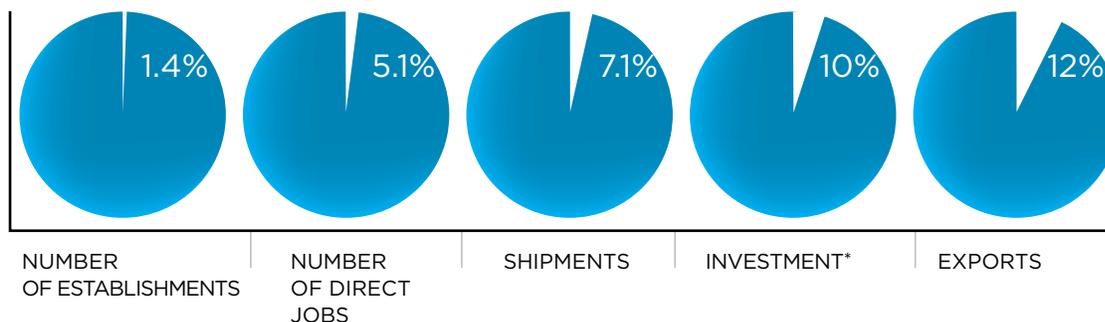
## REASONS FOR THIS ANALYSIS

Several economic indicators are needed to determine the importance of a given sector of economic activity. The impact of some sectors is highly visible because their activities are located throughout a territory (e.g. agrifood) or because they have a high level of employment (e.g. clothing industry). Others, such as the mineral industry cluster, make a less obvious but no less real contribution to the Quebec economy.

An industry's contribution to the economy of a given territory can be evaluated on the basis of variables such as the number of establishments, jobs, sales (shipments), investments and exports, in both absolute and relative terms. Here, the proposed framework for comparison is that of primary industries involved in natural resource extraction (agriculture, forestry, fisheries, mines) in addition to secondary industries (construction, manufacturing).



## COMPARISON OF MINERAL INDUSTRY CLUSTER WITH GOODS PRODUCTION SECTOR - QUEBEC - 2006



Sources: Statistics Canada<sup>13</sup>

## CONCLUSIONS FOR QUEBEC

In comparison with previously defined sectors, the mineral industry cluster represents 1.4% of establishments, 5% of jobs, 7% of shipments, 10% of investments and 12% of exports.

Comparing the Quebec mineral industry cluster with the entire goods production sector reveals the leverage effect the industry has in Quebec. Without considering its indirect effects on employment or tax effects, and despite its small number of establishments, the mineral industry cluster represents a significant proportion of shipments and investments and an even larger share of exports in Quebec. In total, the mineral industry cluster contributes nearly \$7 billion to the GDP (2007), or 2.4% of Quebec's GDP.

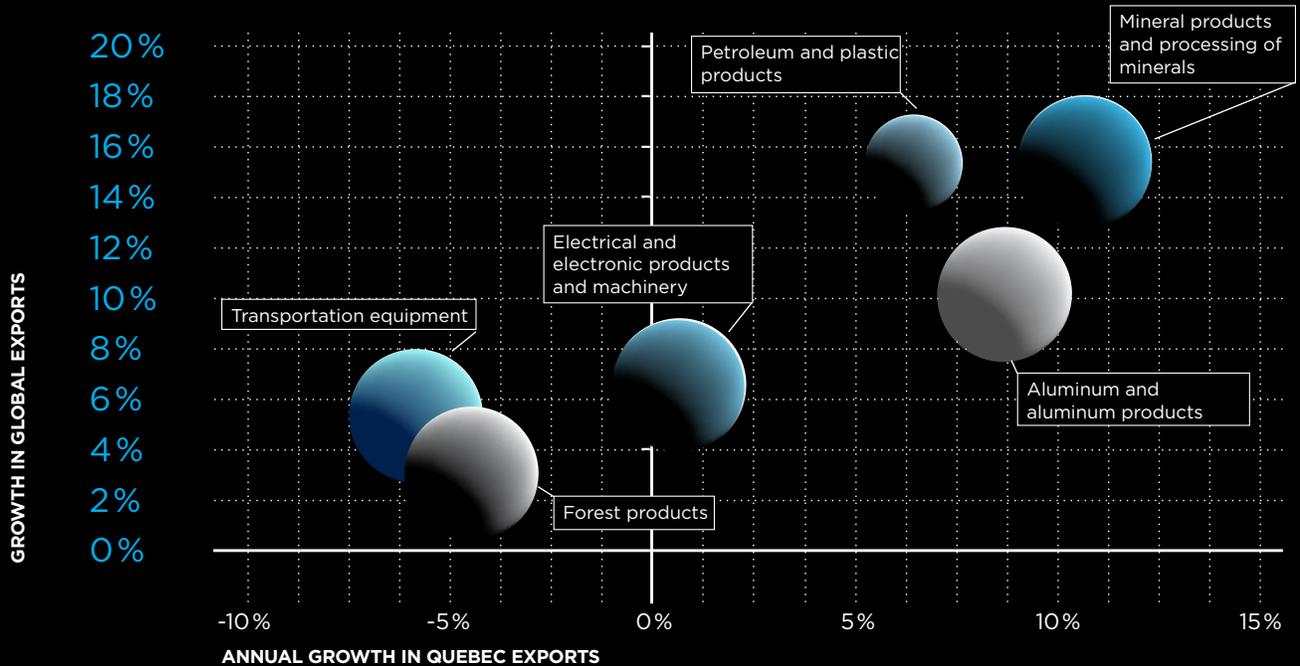
<sup>13</sup> Statistics Canada, Catalogue n° 26-223-X, Metal ore mining, 2006; Catalogue n° 26-226-X, Non-metallic mineral mining and quarrying, 2006; Catalogue n° 72-002-X, Jobs, earnings and hours, December 2007. Number of establishments, Dec. 2007, Table 381-0016. Provincial gross output at basic prices, Table 031-0002.

Flow and stocks of fixed non-residential capital, Canadian trade by industry (NAICS codes). 2006 data, the most recent year for comparative data, except for shipments (2005).

\*Investment includes mining and quarrying, oil and gas extraction, and non-metallic mineral products manufacturing sectors.

# EXPORTS

## COMPARATIVE GROWTH OF QUEBEC'S MAIN EXPORT SECTORS

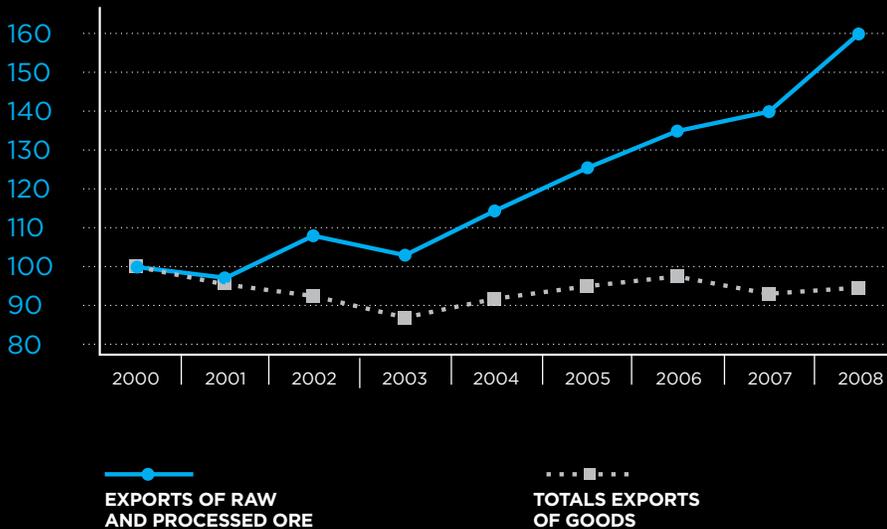


Interpreting the graph: The vertical axis represents the rate of growth (2002-2007) for all exports in all countries for the industries identified. The horizontal axis represents the rate of growth in Quebec exports for the same period, and the size of the circles indicates an industry's share of exports in the total amount of Quebec goods exported in 2007.

Sources: Statistics Canada, United Nations<sup>14</sup>

<sup>14</sup> Statistics Canada. Canadian trade by industry (HS codes), International merchandise trade statistics, United Nations Statistics Division.

**COMPARISON OF VALUE OF EXPORTS OF RAW AND PROCESSED ORE AND ALL EXPORTED PRODUCTS QUEBEC, 2000-2008 - BASE OF 100 FOR 2000**



**REASONS FOR THIS ANALYSIS**

By analyzing the value of exports, it is possible to identify “base sectors,” i.e. those that enrich the economy as a whole by bringing in foreign currency. In addition, growth of the international market for the various industries reveals trends in demand. This analysis therefore makes it possible to determine if an industry is in an international context favourable to its growth or not. This is especially true when emerging from a global financial crisis that affected all sectors of the economy.

**CONCLUSIONS FOR QUEBEC**

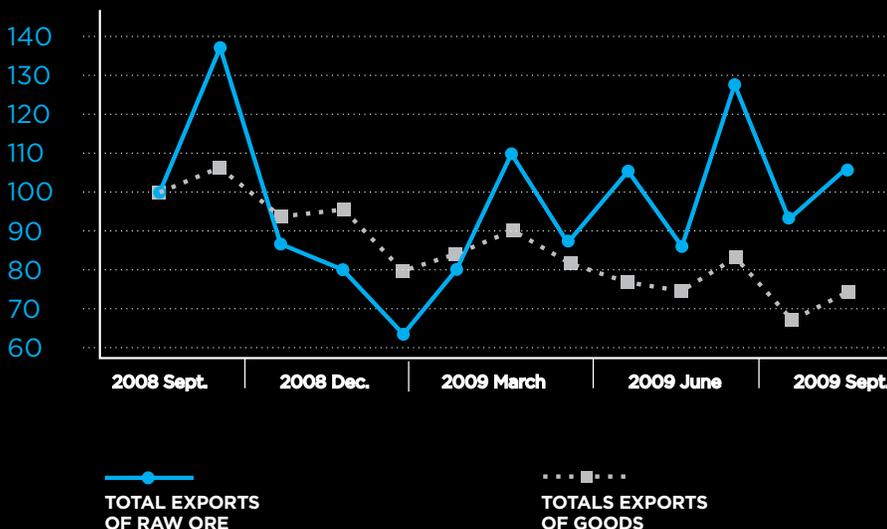
In 2007, the mineral industry cluster’s products represented close to 12% of goods exported in Quebec. From 2002 to 2007, the annual rate of growth in mineral industry cluster exports was 11%, while worldwide growth in exports in this industry was 16%. Although it performs well compared to other Quebec export sectors, there is potential for additional international growth in this sector.

Total value of exports (raw and processed metals and minerals) in 2008 was \$8 billion, representing annual average growth of 8.2% since 2000. Growth picked up pace as of 2003, with an annual average increase of more than 11.5% in the value of exports for ore and more than 18% for the entire mineral industry cluster (2003 to 2008).

Of course, the mineral industry cluster’s exports were affected at the start of the financial crisis in October 2008, but rebounded in early 2009. In September 2009, the value of ore exports, although volatile, had slightly surpassed the level in the previous year (September 2008) whereas the value of all Quebec goods exported remained nearly 25% below the level in September 2008.

Recent data on Quebec mineral exports therefore seems to show that the Quebec’s mineral industry cluster was less affected by the crisis than any other export sector in Quebec.

**COMPARISON OF THE VALUE OF EXPORTS OF RAW ORE AND ALL EXPORTED PRODUCTS QUEBEC, SEPTEMBER 2008-SEPTEMBER 2009 - BASE OF 100 FOR SEPT. 2008**



Source: Industry Canada, Trade by Product (HS codes)

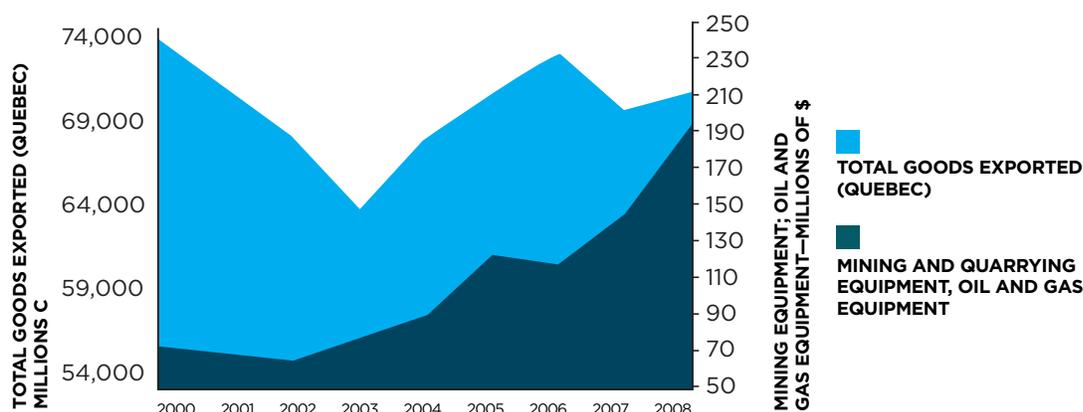
# GROWTH OF AN EQUIPMENT MANUFACTURING INDUSTRY AND SPECIALIZED SUPPLIERS

## REASONS FOR THIS ANALYSIS

The presence of a given industry sometimes leads to the emergence of another industrial sector in the same area. In response to regular demands from an industry, local suppliers, because of their proximity, may respond without any prior expertise in the mining sector (e.g.: machine shops). With experience, some may develop new products, obtain the required certifications and export the products. Local equipment manufacturers and suppliers of specialized products and services can thus take over from foreign suppliers. The growth of an equipment manufacturing industry and specialized suppliers has received little attention so far, due partly to the fact that equipment manufacturing activities have not had a strong presence historically in Quebec.



## EVOLUTION IN EXPORTS OF MINING AND QUARRYING EQUIPMENT, AND OIL AND GAS EQUIPMENT COMPARED TO TOTAL EXPORTS OF GOODS - QUEBEC - 2000-2008 - MILLIONS OF \$



Source: Institut de la statistique du Québec, Trade by industry in Quebec and in Canada.

### EXAMPLES OF EQUIPMENT EXPORTS

SECTOR	EQUIPMENT
EXPLORATION	Drills and drilling equipment
	Geomatics software
	Remote sensing equipment
MINING AND QUARRYING	Roger drill (for risers)
	Communication equipment for enclosed spaces
	Mine support structures
	Ventilation equipment
	Dismountable crushing plants
	Blasting platforms
	Risers
PROCESSING	Tools for measuring ore loads
	Crushers
	Flotation plants

## CONCLUSIONS FOR QUEBEC

Available statistics<sup>15</sup> suggest that in the mining equipment sector, Quebec exports have enjoyed strong growth in recent years and have reached a significant level of export.

- Exports of mining equipment have increased from less than \$65 million in 2000 to nearly \$196 million in 2008. Equipment manufacturers' exports are equivalent to more than 10% of the value of minerals exported by Quebec in 2008.
- This growth corresponds to an annual rate of 14%, while growth decreased slightly for overall exports of Quebec goods in this period. It should be noted that losing the advantage of the US exchange rate over the past decade does not seem to have had any negative impact on the value of exports. This is partly due to high demand, but also to the competitive advantage provided by innovation in terms of the margin for negotiation and setting prices on foreign markets.

Obviously, the growth and diversity in exports of equipment and specialized systems represent major commercial advances, which can be attributed to technological breakthroughs.

Source: Research based on supplier files provided by the six leading mining companies (Agnico-Eagle, ArcelorMittal, Iamgold, Inmet, QIT and Xstrata).

<sup>15</sup> Available statistics integrate data for mining equipment with those for gas and oil equipment, but the latter seems fairly limited in relation to the overall group.



# INNOVATION

## REASONS FOR THIS ANALYSIS

While innovation is one of the drivers of an industry's growth and competitiveness, it does not result from a process whose outcome is assured, either technologically or commercially. Some modes of industrial and regional organization make it possible, however, to optimize innovation in specific regions.<sup>16</sup> In particular, there are regional innovation systems (RIS) whose geographic scope can vary (city, region, province) but which have in common the sharing of information and research between companies, universities and research centres. The presence of such a system in Quebec may suggest a basis of a sustainable competitive advantage for the mineral industry cluster.

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<sup>16</sup> See the work of Lundvall, Freeman et al. since the 1980s.

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## CONCLUSIONS FOR QUEBEC

In Quebec, several universities (INRS, McGill, Polytechnique, Laval, UQAC, UQAM and UQAT) are active in the mineral industry cluster, through programs (nine identified) and/or research chairs. A total of 20 chairs were identified, relating to a particular aspect or the entire mineral industry cluster. As well, there are at least six research consortiums. They include the *Consortium de recherche en exploration minière* (CONSOREM), *Consortium de recherche minérale* (COREM), *Diversification de l'Exploration minérale au Québec* (Divex) and *Société de Recherche et de Développement minier* (SOREDEM). Studies involving both industries and universities have led to several specific projects, including:

- use of hydrogen as fuel for vehicles in underground mine (e.g. hybrid shuttle-loaders);
- technologies for thermal fragmentation;
- techniques for breaking rock without explosives;
- water decontamination processes;
- processes for the chemical dissolution of gold;
- other (e.g. antivibratory handles).

This regional innovation system extends both organizationally (companies, universities and government agencies) and geographically (major urban centres and the regions). To date, this system has fostered technological advances and commercial breakthroughs.

# CONTRIBUTION TO SOCIO-ECONOMIC DEVELOPMENT OF THE REGIONS

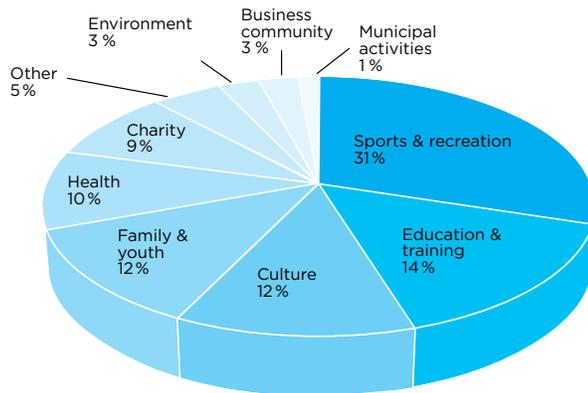
## REASONS FOR THIS ANALYSIS

At the local level, the contribution of local mining industry cluster companies takes the form of job opportunities for local workers, procurement from local suppliers, local taxes and support for civil society, which comprises non-profit organizations that contribute to the community in some manner. This contribution to the socio-economic development of the regions is part of the social aspect of sustainable development and warrants closer examination to obtain a better understanding of an industry's contribution.



## NON-PROFIT ORGANIZATIONS THAT RECEIVE DONATIONS FROM LARGE MINING COMPANIES

QUEBEC - 2006 - 2008



Sources: E&B DATA survey of the six major mining companies. Includes more than 10 facilities in Quebec (Agnico-Eagle, ArcelorMittal, Iamgold, Inmet, QIT and Xstrata).

## MINING INDUSTRY, TRANSPORT EQUIPMENT AND INFRASTRUCTURES

TYPE	INFRASTRUCTURES & EQUIPMENT
RAIL	1,000 km track
	Nearly 100 locomotives
MARITIME	2 deep-water ports
	10 docks
	1 ice-breaker
AIR	1 landing strip
	1 large-capacity aircraft

Source: E&B DATA survey of the six major mining companies (Agnico-Eagle, ArcelorMittal, Iamgold, Inmet, QIT and Xstrata)

## CONCLUSIONS FOR QUEBEC

In the resource regions, the share of wages and salaries paid in the mining Regional County Municipalities by mining companies represents about 26% of all wages in these counties.<sup>17</sup> In addition to this direct contribution to local purchasing power, mining establishments also spend on procurement from local suppliers. Excluding salaries and wages, local and regional operating expenses for members of the *Association minière du Québec* was approximately \$900 million in 2009<sup>18</sup>.

Along with local spending related to operations, the mining companies contribute to local recreational infrastructures (e.g. arenas and swimming pools), where the operating cost and/or maintenance comes from the initial funding or the local taxes paid by companies in the mineral industry cluster.

The breakdown of donations to non-profit organizations by the six major mining companies corresponds more or less to a government portfolio. Of the approximately 1,000 non-profits that receive support, 31% are involved in sports and recreation, 14% in education and training, 12% in culture, 12% in family and youth services (other than sports and recreation, education and training) and 10% in health.

Companies are sometimes prompted to make a commitment to maintain the quality of life of their fellow citizens when public administrations make budget cuts in some social programs. This support, of course, has benefits for the main employers—and is often the case with mines—since it helps attract and retain workers and their families in the regions, with a quality of life and community environment that is acceptable and appealing.

In the resource regions, the mining companies' contribution cannot be measured solely in monetary terms since a significant part of their contribution is made in time, equipment (e.g. loans of office equipment), or services (e.g. transportation and emergency services).

Assessing the value of financial contributions to local communities is complex since, in addition to annual payments, there are one-time contributions or investments which are more difficult to tally. Some examples:

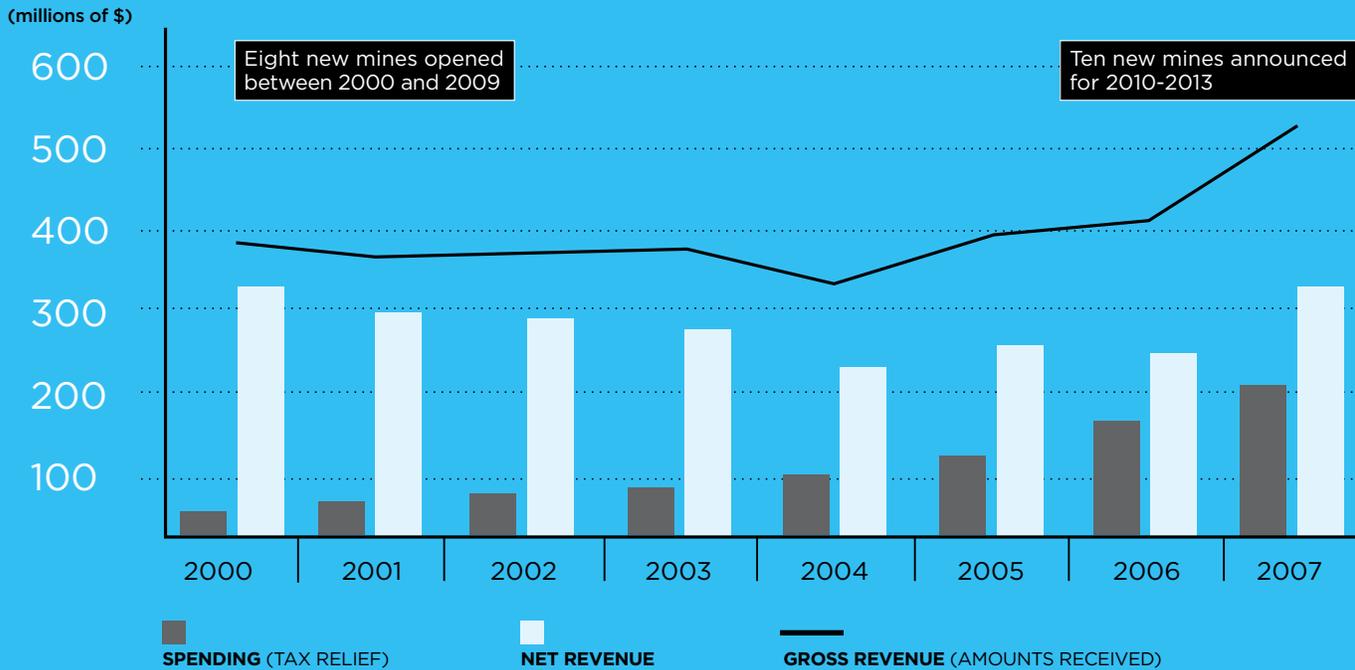
- More than \$35 million in revenue sharing in 2008 with Quebec First Nations communities, excluding donations to First Nations non-profits (e.g.: festivals).
- The large mining companies have developed or maintain transportation infrastructures and equipment whose reconstruction value has been established by E&B DATA at more than \$6 billion.

<sup>17</sup> Sources: *Institut de la statistique du Québec* and E&B DATA.

<sup>18</sup> Source: *Association minière du Québec* – 2009 economic and tax statistics.

# TAX CONTRIBUTIONS

## QUEBEC GOVERNMENT TAX REVENUES AND EXPENDITURES IN THE MINERAL INDUSTRY CLUSTER - 2000 TO 2007 (ESTIMATED)



**Revenue for the Quebec government:** Income tax on direct and indirect wages in the exploration, mining and quarrying and processing of mineral resources, taxes paid on products and services (excise tax, QST), mining royalties, claims and leases, and other payments (prospectors, staking tags, etc.).

**Expenses for the Quebec government:** tax credits for resources, repayable credits for losses, basic deductions of 100% of Canadian costs for flow through shares, deductions related to resources, fuel tax refunds accorded to mining companies.

Sources: E&B DATA, based on statistical data from the following sources: (1) Public accounts of Quebec; (2) *Institut de la statistique du Québec*, 2004 multipliers, *Tableaux d'impact économique du modèle intersectoriel du Québec*; (3) Statistics Canada: Table 304-0015: Manufacturing sales, North American Industry Classification System; Quebec; Sales of manufactured goods (shipments); Catalogue n° 26-223-X (Metal ore mining) and n° 26-226-X (Non-metallic mineral mining and quarrying); (4) Natural Resources Canada: Exploration expenditures, mineral production in Canada, by province and territory.

## REASONS FOR THIS ANALYSIS

The Quebec government's strategic support for the mineral industry cluster has been designed to meet the needs of an industry characterized by the risk inherent in discovering new ore deposits and by cycles associated with steep variations in the price of raw materials. It must also mitigate the impact of closing old mines by opening new mines.

- The Quebec government's actions take the form of a series of tax incentives, including tax credits for flow through shares (allocation of risk), accelerated tax depreciation system; tax credit for resources, taking into account the location of the site (sharing the risk with the government for the development and occupation of the territory); fuel tax refunds (shared with agricultural and forestry industries) and deduction of one-third of the capital paid by mining companies<sup>19</sup>.

The impact of these tax expenditures is, however, reduced by tax revenues related to the economic activities of the overall mineral industry cluster. Thus, while government aid is largely focused upstream, i.e. on exploration, most of the benefits are downstream in mining and quarrying and processing. If the workers' provincial income tax throughout the industry cluster is taken into account, along with other revenues such as tax on the added value of transactions in Quebec, a more complete portrait of the impact on public finances is obtained.

## CONCLUSIONS FOR QUEBEC

### ON AVERAGE

From 2000 to 2007, with \$110 million in average annual tax spending in support of the industry, the Quebec government took in \$391 million in new gross tax revenues, for average net revenues of \$281 million per year.

### 2007

For 2007, the latest year for which complete statistics are available, the gross tax receipts of the Quebec government were \$531 million, including:

- \$395 million in income tax on direct and indirect workers;
- \$37 million in taxes (notably taxes on added value);
- \$99 million in revenues on mineral rights and claims paid by the exploration sector.

For this same year, credits and deductions for the mineral industry totalled \$204 million. Net tax revenue for the Quebec government was \$327 million for 2007<sup>20</sup>, an increase compared to an average of \$281 million between 2000 and 2007.

Although support via direct tax assistance, technical support or financing is aimed primarily at mining exploration, these tools allow the government to contribute actively to the development of a strong mineral industry cluster. As well, support for exploration has produced results since eight new mines (Fabie Bay, East Amphi, Langlois, Croinor, Lac Herbin, Goldex, Casa Berardi and Persévérance) opened between 2000 and 2009, and 10 more are expected to open between 2010 and 2013. The opening of these new mines led to the creation of 1,230 direct jobs that offset the loss of 994 jobs in the 10 mines shut down since 2000<sup>21</sup>.

<sup>19</sup> A mining company can reduce its tax on capital by 33 1/3% provided that its gross earnings for the year are derived from a mineral resource.

<sup>20</sup> Estimate. Corporate income tax was not estimated, nor were company and worker contributions to the Quebec Pension Plan and *Commission de la Santé et de la Sécurité du Travail du Québec*. The financial guarantee for remediation was also not taken into account.

<sup>21</sup> Source: "Mine Openings, Reopenings, Closings, Expansions and Temporary and Definitive Closings in Canada, 1994 to 2007, Natural Resources Canada.

# EXPLORATION

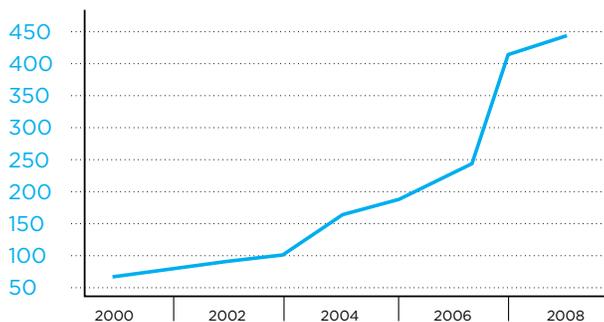
## REASONS FOR THIS ANALYSIS

All industries seek new sources of business in order to ensure their continued existence. The mineral industry conducts research and development downstream on uses for metals and upstream on finding new deposits, through exploration. This requires high levels of investment over many years so that existing reserves can be replaced. The level of activity on this latter point and the associated funding are critical elements in evaluating the viability and the very future of the mineral industry cluster in the economy and in the regions.



## CONCLUSIONS FOR QUEBEC

### EXPLORATION EXPENDITURES QUEBEC - 2000 -2008 (IN MILLIONS OF \$)



Source: Natural Resources Canada, based on federal-provincial-territorial records of mining exploration spending, evaluation of deposits and development of mine complexes (June 2009).

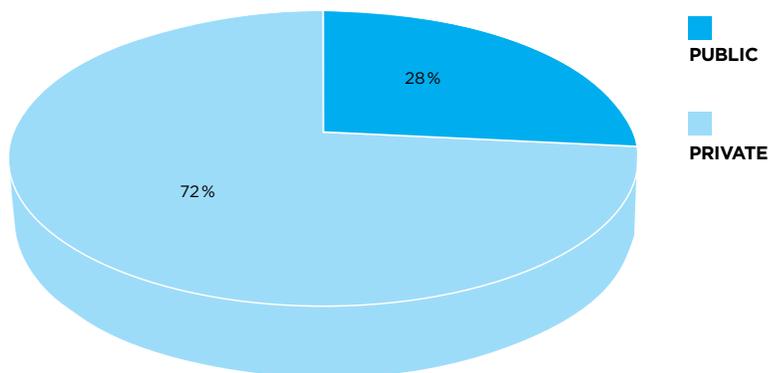
Note: Excludes *Géologie Québec*.

The exploration industry is increasingly active in Quebec, and its activities have grown by an average of 65% per year since 2000 to \$441 million in 2008, including a tax contribution from the government for 23% of total expenses. For every dollar provided by the government of Quebec, the private sector invests \$2.55, specifically the SMEs (the “juniors”).

This activity is primarily in the Nord-du-Québec region (57% of exploration expenditures), followed by the Abitibi-Témiscamingue region (32%), and the Côte-Nord region, (8%). The activity is intense in the Abitibi-Témiscamingue region considering the land area because of its exceptional geological features (Cadillac Fault zone)<sup>22</sup>.

<sup>22</sup>Sources: *Ministère des Ressources naturelles et de la Faune* and *Institut de la statistique du Québec* (2007).

### DISTRIBUTION OF FUNDING FOR EXPLORATION SPENDING QUEBEC - 2008



Sources: Natural Resources Canada, based on federal-provincial-territorial records of mining exploration expenditures, evaluation of deposits and development of mine complexes. *Ministère des finances du Québec, 2008*.

Note: Public funding includes spending by *Géologie Québec* and fiscal spending in tax credits and benefits. Private funding includes the portion invested by mining exploration companies, after deduction of tax credits and benefits.

# INVESTMENT

## REASONS FOR THIS ANALYSIS

In addition to jobs or exports, an industry's viability depends of various types of investments for the purpose of modernizing or expanding facilities or upgrading them in order to comply with environmental regulations or health and safety standards. Analysis of recent and projected data regarding investments can shed light on the future of an industry within an economy.



## NEW MINING PROJECTS ANNOUNCED IN QUEBEC

PROJECT	COMPANY	ORE	REGION	ANNOUNCED AMOUNT \$M
Canadian Malartic	Osisko	Gold	Abitibi-Témiscamingue	1 000
Éléonore	Goldcorp	Gold	Nord-du-Québec	750
Westwood	Iamgold	Gold	Abitibi-Témiscamingue	514
Raglan Sud	Canadian Royalties et Jilin Jien Nickel Industry	Nickel	Nord-du-Québec	500
Lac Bloom	Consolidated Thompson Lundmark	Iron	Côte-Nord	410
Matoush	Ressources Stracteco	Uranium	Nord-du-Québec	343
Renard et Lynx	Stornoway	Diamonds	Nord-du-Québec	308
Lac MacLeod	Western Troy Capital Ressources	Copper/molybdenum	Nord-du-Québec	248
Laronde II	Agnico-Eagle	Gold/silver/zinc/copper	Abitibi-Témiscamingue	233
Coulon	Mines Virginia	Copper/zinc	Nord-du-Québec	16

Source: E&B DATA, based on public announcements and validated with industry representatives (September 2009).

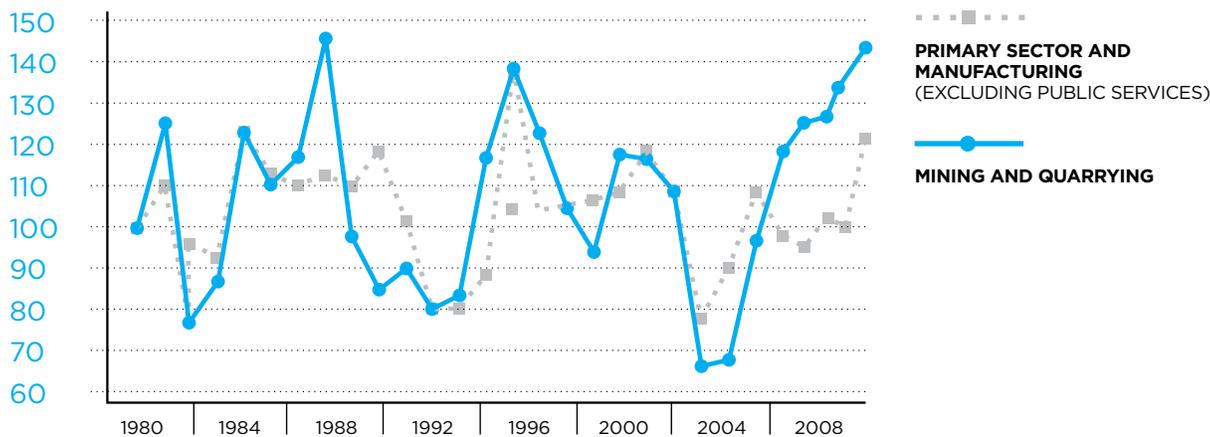
## AMOUNTS ATTRIBUTED TO INVESTMENTS, BY TYPE OF PROJECT

YEAR	NUMBERS OF RESPONDENTS	BREAKDOWN BY TYPE OF INVESTMENT			
		Modernization	Expansion	Exploration	Environmental and other
2006	13	53%	20%	22%	5%
2007	13	53%	34%	8%	5%
2008	16	61%	18%	17%	3%
2009	10	41%	47%	10%	2%

Source: E&B DATA - Survey of mining establishments

Note: Data for 2009 is estimated.

## CAPITAL INVESTMENTS IN THE MINING INDUSTRY QUEBEC - 1980-2008



Index: 100 for 1980

Source: Statistics Canada, Table 31-0002.

## CONCLUSIONS FOR QUEBEC

The comparative analysis of capital investments in the mining industry shows more pronounced cycles than in the rest of the economy, but also more activity since the economic slowdown. Overall, growth in the value of capital investments in the mining industry has averaged 8% annually since 2000, compared to 6% for the rest of the Quebec economy.

Between 2006 and 2008, 53% to 61% of expenses have been used to modernize equipment, 18% to 34% for expansion, and 3% to 5% for environment-related expenses. In addition to these activities, new projects valued at approximately \$4 billion have been announced. When considering only projects valued at more than \$200 million, there are nine new development projects, including five in the Nord-du-Québec region, three in the Abitibi-Témiscamingue region and one in the Côte-Nord region. The schedule for completion, which depends on economic recovery, has not yet been determined. However, the impact on employment will be significant. For instance, the *Comité action mines* for the Nord-du-Québec region estimates that 1,000 workers will be needed to fill new positions on sites that will be developed in the next five years.<sup>23</sup>

<sup>23</sup>The Lure of the North (an organization funded by Xstrata zinc, Xstrata Nickel, Mines Opimaca (Goldcorp), three Quebec government ministries, the James Bay school board, *Centre d'études collégiales de Chibougamau*, and two paragonovernmental organizations).

An appropriate information base is essential to allow for a renewed discussion of an industry's contribution to Quebec society in the context of sustainable development. In this regard, it is useful to examine the contribution of Quebec's mineral industry cluster from a value chain perspective.

In 2006, there were 36,000 direct jobs in the Quebec mineral industry cluster. Overall, this industry cluster accounts for 12% of total goods exported in Quebec.

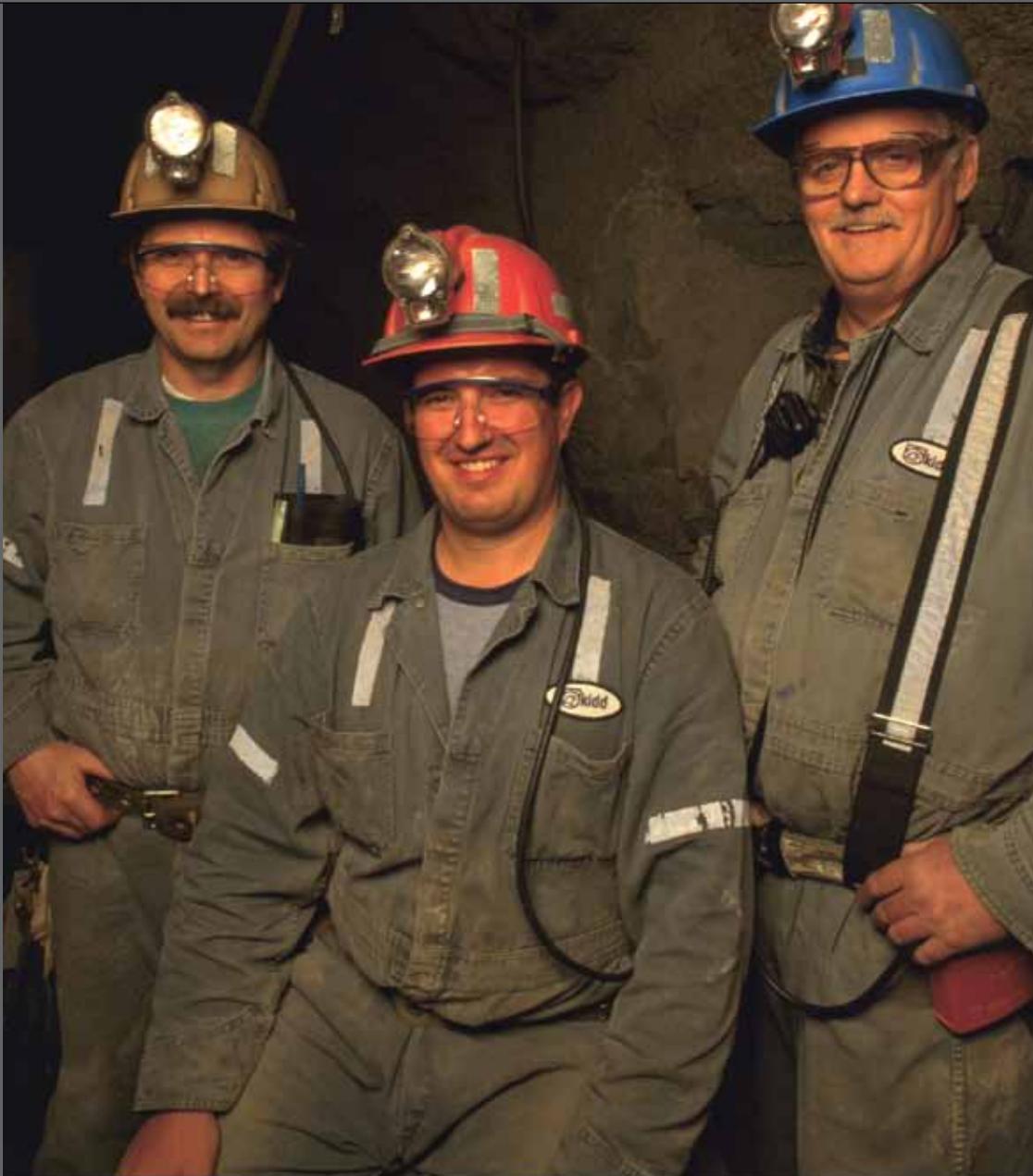
Government support helps compensate for the sharp cycles in the industry, as well as the risk inherent in mining exploration. Overall, the Quebec economy and the government's public finances benefit from the mineral industry cluster's success.

Quebec's mineral industry cluster is the top performer on foreign markets when compared to all other major industrial sectors in the province, in an international market that has grown rapidly in recent years and for which analysts predict a recovery based on a strong underlying demand in newly industrialized countries in the first half of the 21<sup>st</sup> century.

The industry cluster's success has benefits for regions, not just those where mines are located (1,800 suppliers identified in the Montreal region). Some of these suppliers have developed expertise that is recognized abroad: mining equipment exports are one of the dynamic sectors in Quebec, often bolstered by close ties with most Quebec universities and more than 20 research chairs and centres.

Lastly, development work announced for the opening of 10 new mines will contribute to the strength of Quebec's economic recovery.





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- **NATURAL RESOURCES CANADA** (minerals and metals sector);
- **MINISTÈRE DES RESSOURCES NATURELLES ET DE LA FAUNE, MINES SECTOR** (mining taxation branch, mine site remediation branch);
- **COMITÉ SECTORIEL DE MAIN-D'ŒUVRE DE L'INDUSTRIE DES MINES;**
- **MINISTÈRE DES FINANCES;**
- **INSTITUT DE LA STATISTIQUE DU QUÉBEC** (economic and sustainable development statistics branch, mining sector);
- **STATISTICS CANADA;**
- **INDUSTRIAL RESEARCH CHAIR IN ENVIRONMENT AND MINE WASTES MANAGEMENT, POLYTECHNIQUE-UQAT;**
- **CHAIRE DE RECHERCHE EN RESTAURATION DES SITES MINIER ABANDONNÉS,** Université du Québec in Abitibi-Témiscamingue;
- **CONSORTIUM DE RECHERCHE MINÉRALE COREM;**
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Photos: Québec Mining Association and Québec Mineral Exploration Association



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