

## ECONOMIC VIEWPOINT

# Securing Canada's Position as a Critical Minerals Superpower: The Quebec Mining Industry

By Marc-Antoine Dumont, Senior Economist

In this first in a series of Economic Viewpoints on critical minerals in Canada, we explore the features and future of the Quebec mining industry. With an established foothold in the aluminum and iron ore sectors and 34 active mines extracting everything from copper and lithium to gold, La Belle Province is among the top producers of metals and minerals in Canada. It boasts a wealth of rich mineral reserves and relatively cheap electricity. And its critical minerals strategy and battery initiative are poised to make the province a key global producer of green technologies and critical minerals. However, many obstacles stand in the way of new mines, refining facilities and battery plants. Chief among these are a lack of electricity production and other infrastructure and a tight labour market. High interest rates and insufficient foreign capital compound the costs of these already complex projects. That said, important strides are being made in exploration investment, and plans are in the works to build new power plants. Overcoming these challenges could fuel economic growth and job creation for years to come.

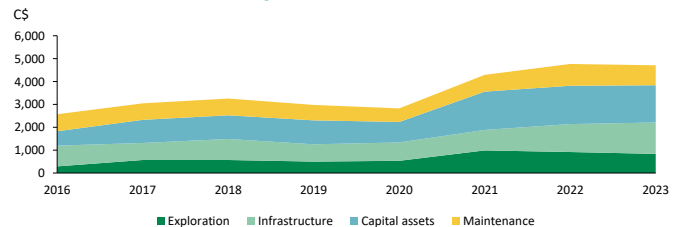
### An Overview of the Quebec Mining Industry

Quebec's abundant mineral reserves have helped its mining industry flourish in recent decades, especially over the past 20 years. Since 2000, 28 mines have been either brought online or reopened, with some dating back to the last century. And that's not counting mines of surface minerals like sand and gravel. According to Statistics Canada, there are now 34 active mines and over 20,000 jobs in the sector (table 1 on page 2). Although the pandemic impacted the mining industry, its real GDP fared better than that of comparable sectors like agriculture and manufacturing. But while real, inflation-adjusted output in most goods-producing industries returned to growth in 2022, mining and quarrying experienced a third consecutive year of decline as supply chain issues and lockdowns continued to be a drag. Yet investment in the industry continued to increase, especially on the exploration side, with annual investment growing 52.2% in 2021 and 10.9% in 2022. The reasons behind the 85% increase are two-fold (graph 1). The first is higher prices and demand for critical minerals, as events in recent years have highlighted the need to accelerate the energy transition and ensure that global mineral production is sufficient to reach this goal. The second is the federal tax credit for exploration, which was introduced in 2022. There are also provincial programs.

Graph 1

Exploration Investment Has Doubled since 2020

Quebec – Investment in the mining sector



Institut de la statistique du Québec and Desjardins Economic Studies

Production values are also healthy after jumping 24.7% in 2021, although price increases are behind most of the gains. Nevertheless, the addition of new mines and the expansion of existing ones will result in larger volumes. Combined with favourable prices, which are expected to hold on to most of their pandemic gains, the mid-term production outlook looks promising. (For more information on our forecast, see our recent [Commodity Trends](#) note.) The number of projects in development has also skyrocketed as the policy agenda and private sector interest have aligned in recent years. In 2022, Quebec, Ontario and British Columbia had by far the most new projects if we

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NOTE TO READERS: The letters k, M and B are used in texts and tables to refer to thousands, millions and billions respectively.

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## Overview of the Quebec Mining Industry

Key indicators	Mid-term outlook	2020	2021	2022	2023	2015–2023 average
<b>Economic statistics</b>						
Real industry GDP (% change)	●	-3.2	-1.5	-3.2	n/a	1.5
As a % of total real GDP		1.3	1.2	1.1	n/a	1.3
Investment (\$B)	●	2,821	4,293	4,762	4,706	3,435
% change		-5.3	52.2	10.9	-1.2	9.6
Capital assets, and repair and maintenance (\$B)	●	1,485	2,406	2,620	2,494	1,878
% change		-13.7	62.0	8.9	-4.8	10.3
Exploration and deposit appraisal (\$B)	●	534	990	914	835	608
% change		6.1	85.4	-7.7	-8.7	21.3
Jobs (number)	●	19,460	21,530	20,285	n/a	19,613
% change		-7.2	10.6	-5.8	n/a	1.8
Compensation per hour worked (\$)	●	58	57	61	n/a	52
% change		17.0	-3.1	7.2	n/a	2.7
Productivity (\$)	●	142	124	127	n/a	131
% change		13.8	-12.7	2.4	n/a	1.1
Total production (\$M)	●	9,725	12,128	12,036	n/a	10,203
% change		-18.4	24.7	-0.8	n/a	0.7
<b>Key metal prices (US\$/ton)</b>						
Aluminum	●	1,704	2,473	2,706	2,255	2,031
Copper	●	6,175	9,312	8,832	8,486	6,878
Cobalt	●	31,441	52,434	63,269	33,924	28,442
Graphite	●	485	560	830	716	634
Lithium	●	486	546	827	726	634
Iron ore 62% Fe	●	108	160	120	118	95
Iron ore 65% Fe	●	104	191	144	137	n/a

Legend : ● Difficult ● To be monitored ● Promising

n/a: not available

Statistics Canada, Institut de la statistique du Québec, Datastream, Bloomberg and Desjardins Economic Studies

include mines and refining facilities (graph 2). So overall, things are looking up for the industry.

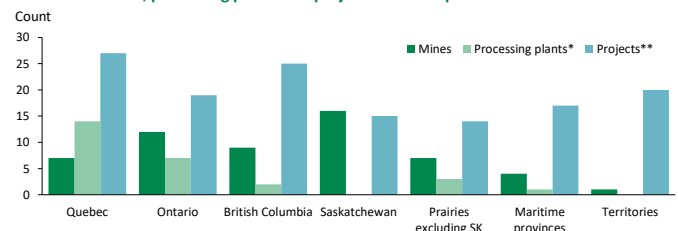
### Quebec’s Key Metals

Although Quebec’s mining industry is relatively well diversified, some minerals occupy a more prominent role than others, such as iron ore and aluminum. Iron ore is mined in the Labrador Trough, which is considered the industry flagship. At the same time, a new wave of investment funded the expansion of the Mont-Wright mining complex in 2021 and the restart of the Bloom Lake mine in 2018. Since the turn of the millennium, iron ore production has more than doubled, from 14.1 million tons to 35.3 million in 2022.<sup>1</sup>

Quebec’s edge and interest in this mineral lie in the quality of the iron it produces. The steel industry is decarbonizing by converting

**Graph 2**  
Most New Projects Are Concentrated in Quebec, Ontario and British Columbia

Number of mines, processing plants and projects in development across Canada in 2023



\*Includes refining and manufacturing facilities; \*\* Includes mines and refining and manufacturing facilities. SK: Saskatchewan  
Natural Resources Canada and Desjardins Economics Studies

its traditional coal-fuelled smelters to electric arc smelters. These require a high-grade ore because they were originally designed to use scraps. As the share of arc smelters rapidly increases and scrap inventories struggle to keep up, demand for Quebec

<sup>1</sup> Based on available data from Statistic Canada table 16-10-0022-01.

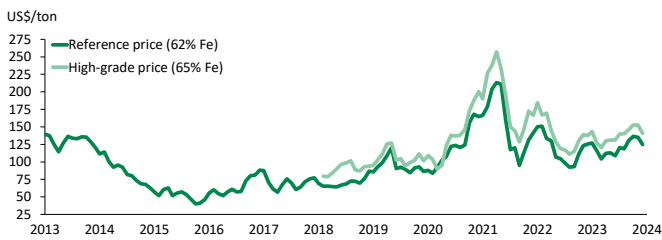
high-grade ore is rising.<sup>2</sup> This trend will most likely continue for many years as very few countries are capable of producing an ore of sufficient quality for arc smelters. With the price of the international reference 62% Fe facing some challenging years ahead, high-grade 65% Fe should fare better and maintain an attractive price premium over 62% Fe (graph 3).

European Union implementing a border carbon tax, this is a significant advantage, and one that is shared with the steel and iron sector.

**The Provincial Government’s Strategy**

But Quebec’s journey to energy transition superstardom isn’t just an iron and aluminum story. Many other metals are part of the provincial government’s [critical minerals strategy](#). There are projects in the pipeline for copper, platinum group metals and rare earth elements, and the wave of exploration investment discussed above will likely result in new mines. Moreover, [La filière batterie](#) aims to develop a one-stop shop for batteries by building mines, refineries and factories that could make Quebec a key producer on the world stage. The province also began extracting lithium again in 2023 with the La Corne mine and recently green lighted a new lithium mine in the James Bay region. Cobalt and graphite are also in the lineup of promising minerals, with two active mines and one active mine respectively. However, these three metals are subject to price volatility as both production and demand are rapidly increasing around the world. In the case of lithium, strong supply growth has sent the price tumbling 36.7% from its peak (graph 5) and forced [layoffs in Quebec’s only lithium mine](#).

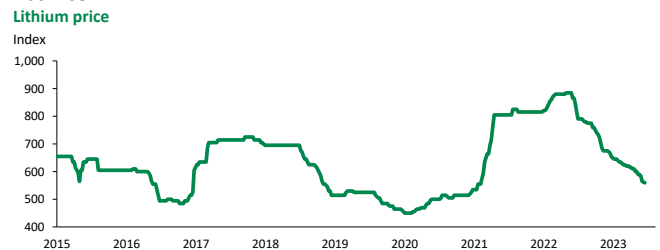
**Graph 3**  
**Higher Quality Iron Ore Should Maintain Its Premium**



DataStream, Bloomberg and Desjardins Economic Studies

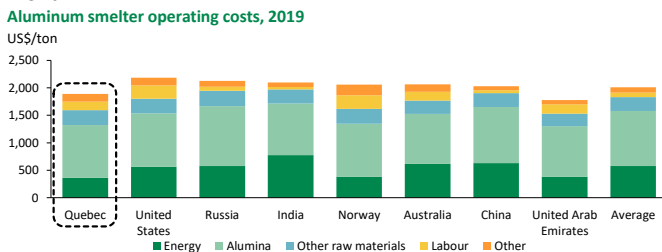
Aluminum is not far behind iron. Canada is the world’s fourth-largest aluminum producer, making 3 million tons in 2022. And 10 of Canada’s 11 aluminum smelters are in Quebec, specifically in the Saguenay region. While the quality of aluminum produced is not to be underestimated, low energy costs are the true strength of Quebec’s aluminum industry. According to a study by McKinsey, all other production input costs are higher than average, but energy costs are about 30% lower (graph 4). That’s because Quebec uses hydroelectricity, which is low cost and has a low carbon footprint. It also means primary production<sup>3</sup> is approximately [70% less CO<sub>2</sub> intensive](#) in Quebec than it is in the Middle East or China. With the world in transition and the

**Graph 5**  
**The Price of Lithium Has Fallen 36.6% since Its Peak as Global Production Has Risen**



Bloomberg and Desjardins Economic Studies

**Graph 4**  
**Quebec Aluminum Smelters Have Some of the Lowest Energy Costs in the World**



McKinsey, CBC and Desjardins Economic Studies

**A Future Not without Challenges**

As geological surveys and exploration are carried out for both the critical minerals and battery strategies and groundbreaking ceremonies get underway at the first new mines, Quebec must start planning for what comes next. Its greatest advantage—cheap electricity—could become a burden. The widely discussed 40 TWh electricity surplus the province had in 2019 is expected to turn into a very tight market around 2026–2027, threatening to drive up industrial energy prices and impede new industrial projects. To address this concern, provincial electricity distributor Hydro-Québec has committed to invest up to \$185 billion by 2035 as part of its [Action Plan 2035](#). The plan aims to add 8,000 MW to 9,000 MW of electricity production to decarbonize Quebec’s economy and meet industrial and residential demand. The plan is still in its early stages, however.

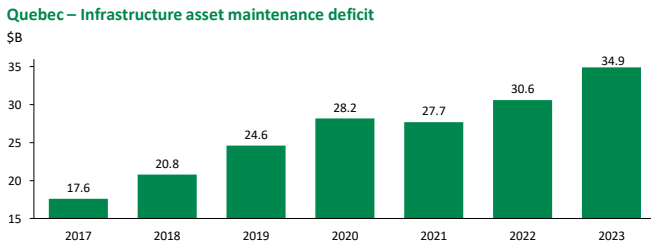
<sup>2</sup> In simple terms, the grade of an iron ore is based on the quantity of iron it contains. The global reference ore is 62% Fe, which means it contains 62% iron. Quebec produces an ore of 66.2% Fe, which is considered high quality. A project is also in the works to produce an ore of 69% Fe, which would be very high quality.

<sup>3</sup> Primary metal production is a process of transforming ore into metals, while secondary production involves producing alloys from scraps and salvaged materials.

But the lack of infrastructure goes beyond the power grid. The existing roads, railroads, aqueducts and public infrastructure in mining communities are inadequate to support the many new mines the government wants to bring online, especially in remote locations. While this is nothing new for the mining industry, it still remains one of the biggest challenges that Quebec needs to overcome in order to tap into its immense mineral reserves. Competition for capital will be fierce in the next decade. But high population growth and relatively slow investment in the past few years also mean that significant capital is needed across the province to improve its standard of living. (See our recent [research](#) on this topic.)

Another major obstacle is the availability of skilled labour. Although Quebec has the expertise to build and operate mines, the mining industry is competing with other sectors of the economy that need the same workers, such as residential construction and engineering works, as Quebec’s infrastructure maintenance deficit is increasing steadily (graph 6). High labour demand and limited supply mean that wages will likely go up in these industries, which could in turn drive up the cost of new projects and even delay some.

**Graph 6**  
The Growing Asset Maintenance Deficit Is a Cause for Concern



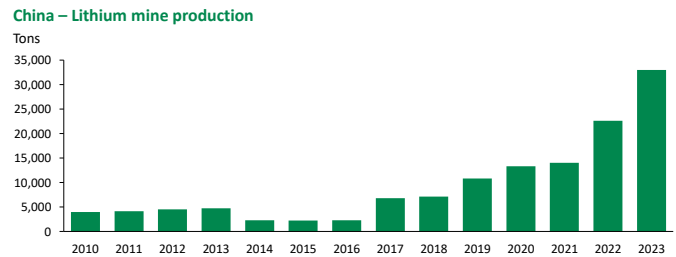
Plan québécois des infrastructures and Desjardins Economic Studies

But there are still other challenges to investing in metals and minerals, and not just in Quebec. These include high interest rates that are complicating financing, price volatility that can quickly change market conditions, and shifting technologies that can undermine long-term demand for some metals. The uncertain geopolitical landscape is also a concern.

**What Can Be Done?**

The future is never without challenges. But waiting to move forward can mean missing out on some of these unique opportunities. The province of Quebec isn’t the only jurisdiction trying to rapidly develop its mining sector. Our allies and partners in the Minerals Security Partnership are building their own production capacity and investing in countries other than Canada. China is also proving very effective at bringing online new critical mineral mines, refineries and plants (graph 7).

**Graph 7**  
Lithium Mine Production in China Has Doubled since 2021



Datastream and Desjardins Economic Studies

However, streamlining the approval process for new projects while maintaining rigorous environmental and socioeconomic standards isn’t as simple as one would hope. That said, progress can definitely be made, and we’ll discuss the policy side of this topic in a future note. Meanwhile, infrastructure shortages need to be addressed. Although new investment is essential, repurposing old facilities or abandoned mine sites shouldn’t be ruled out, as it requires less capital than building new ones. It may also give new life to communities that were devastated when their mines or refineries closed. Developing the province’s transportation infrastructure and boosting energy production should help the industry grow.

But even with the best of intentions, building infrastructure takes time. Hydroelectric dams—the backbone of Quebec’s energy supply—are massive undertakings that require years of planning and construction. And these dams have a high initial capital cost, as do wind and solar energy. With today’s interest rates ballooning project price tags, the bill for the government might get too big. In some cases, the conventional model of a sole public energy provider may need to be reconsidered. Rio Tinto, which produces aluminum in Quebec, already has dams and reservoirs it uses to produce its own electricity. Installing private solar and wind farms at remote mine sites could alleviate the burden of new projects on the electrical grid and spread the cost of building infrastructure across stakeholders. International investment will also have a role to play, and Quebec should tap the deep pockets of every willing aligned partner, especially the United States.

The remote locations of many mines amplify the mining industry’s labour shortages. Although immigration is certainly part of the solution, attracting skilled labour to remote locations is complicated. Mining companies often partially rely on a fly-in fly-out workforce, which is usually more expensive than hiring local workers. Adjusting the immigrant selection criteria to find the skilled workers needed and promoting regional immigration will help to develop the mining industry. The provincial government has detailed its goals in its [2023–2027 strategic plan](#), which says it aims to raise the share of migrants residing outside the Montreal metropolitan area from 23.7% in 2023–2024 to

25.0% in 2026–2027. But it’s unclear if that will be enough to address the labour shortages in those regions.

As in many other sectors, innovation and automation will help to bridge the gap. That said, productivity has been an issue in Canada for some years, and the mining industry is no exception. Since 2012, mining productivity has been on a roller coaster ride, although it’s up 43.3% from its record low recorded in 2012 (table 2). The trend in recent years has been negative after peaking in 2015. That said, many new technologies look promising, including drones to conduct surveys and measure mineral stockpiles, and self-driving vehicles like the 300-ton autonomous hauling trucks used at the [Côté Gold mine in northeastern Ontario](#). The mining industry also suffers from lower digital integration than sectors such as manufacturing and would therefore stand to benefit from increased use of technologies like wireless monitoring, digital twins<sup>4</sup> and GPS tracking. Many Quebec mining companies are already working to implement some of these innovations, but it’s not easy. These technologies are expensive, though most have come down in price over time. They also require skilled workers to implement and operate. And large organizations like most mining companies take longer to make changes and move to new production methods. Having reliable access to large sums of capital is therefore crucial for the mining industry to tackle the productivity issue at hand.

roadblocks. But even if the path is cleared tomorrow, the scale and complexity of these projects mean that only a few more could get up and running by the late 2020s. Nevertheless, if Quebec succeeds, it could fuel economic growth and job creation for years to come.

**Table 2**  
Mining, Quarrying and Oil Is Doing Better than Many Other Industries

SECTOR	GDP PER HOUR WORKED	2012–2022 CHANGE (%)
Mining, quarrying and oil	126.7	43.3
Agriculture, forestry, fishing and hunting	52.4	59.3
Construction	49.5	-11.8
Manufacturing	66.5	7.3
Wholesale trade	72.7	29.1
Transportation and warehousing	43.1	-2.3
Information and cultural industry	90.9	28.2
Finance and insurance	85.7	40.0
Service-producing sector	52.0	19.5
Goods-producing sector	66.6	5.2
<b>All industries</b>	<b>59.7</b>	<b>11.0</b>

Datastream and Desjardins Economic Studies

## Conclusion

The province of Quebec sits on a proverbial gold mine of minerals. But unlocking it will require overcoming the current infrastructure deficit and worker shortages. Plans are already in the works, but they’re either in the early stages or more is needed to correct course. We’ve seen a record wave of exploration investment recently, so the number of new mines and battery plants that open will depend on the effectiveness and speed with which the Quebec government removes these

<sup>4</sup> Virtual replicas of physical assets, processes and systems providing a representation of both the core elements and dynamics of IoT devices used within the space or system depicted.