

State of the Ontario Mining Sector

Photo: IAMGOLD Côté Mine



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State of the Ontario Mining Sector

Foreword by Priya Tandon, President of the Ontario Mining Association



Ontario's mining sector is a key pillar in our modern, technology-driven economy, delivering well-paying jobs, providing key inputs to the North American manufacturing supply chain, and playing a vital role in our continental security. Industry partnerships with Indigenous communities advancing their economic development, and our safety and environmental practices can be a model to the world.

Our geology has allowed Ontario to be a world-leading mining jurisdiction. Ontario is a globally important producer of gold, which acts both as a modern manufacturing input, and as an important currency backstop. Ontario is also home to nine operating critical minerals mines, supplying advanced materials for the continental market in areas such as health diagnostic equipment, aerospace, and defence. Large areas of the province with high mineral potential also remain to be explored; almost a billion dollars was spent on exploration and deposit appraisal in 2023.

Ontario has been able to capitalize on its natural resources and strong adherence to the rule of law, creating an attractive investment climate. Our success has been grounded in a stable and reliable legal framework, security of tenure, and a commitment to the ongoing pursuit of continuous improvement in the regulatory system. We will continue to uphold safe production as a fundamental aspect of Ontario mineral operations.

In recent years, technology has revolutionized the mining industry. Developments in digital technologies, analytics, cloud and autonomous operations have created massive opportunities for improving safety, productivity and competitiveness. From satellite imaging to robotics, mining companies have invested in innovation from the lab bench to the mine site, which has advanced Ontario's technological expertise both inside and outside the sector.

Innovation and industry success has created a support structure of professionals that includes miners, engineers, the mining supply and services sector, financiers, service providers, scientists, and other professionals. This creates a mining ecosystem unparalleled in the world. However, it is now vulnerable to geopolitical and trade uncertainty.

Generational change is happening now, giving the mining sector an opportunity to better represent Ontario's diverse population and to tap into the technical expertise and drive of young people. The OMA is making efforts to inspire more young Ontarians to consider careers in mining by highlighting the sector's technological advancements, relationships with Indigenous communities, commitment to safety and high compensation.

Given the current state of the sector, mining companies must continue to evolve. Ontario will need to focus on continuous improvement of its regulatory timelines to bring key projects to market and attract global investment to build more mines. We need to strengthen our immense capability for value-added processing in base metals, advanced battery materials, and in gold refining, while seeking out diversity in our markets to fully leverage our potential.

Opportunities for the Ontario mining industry remain strong. Demand for gold remains robust, and the demand for critical minerals is expected to increase with the re-industrialization of key trading partners. This report, which was supported by the Ontario Ministry of Mines, describes the current state of the industry and lays out a path forward. Much hard work lies ahead to ensure Ontario's mining sector remains competitive and that new reserves to fill the processing pipeline are discovered through a robust claim registration system. Working with government, Indigenous communities, stakeholders and industry, we can solidify our competitive advantages by driving continuous improvement and deliver shared value by generating investment, creating jobs and opportunities, while enhancing our supply chain security.



Executive Summary

Photo: Frontier Lithium

Key Statistics

The mining sector plays an important role in Ontario's economy and contributes to regional communities, including Sudbury, Timmins, Northeastern, Northwestern and Southern Ontario.

36

Active Mines

\$15.7 billion

Mineral and Metal Production, 2023

150,000

Mineral and Mining Sector Employment

12%

Indigenous Employment

142

Active Community Partnerships

30

Major Projects Planned / Under Construction

\$64 billion

Mineral and Metal Products Exported in 2023

364,531

Active Mining Claims, 2024



Executive Summary

- Ontario's **36 active mines** produced **\$15.7 billion worth of minerals and metals** in 2023. The largest value metal produced was gold, at \$6.5 billion, followed by nickel at \$2.5 billion.
- Mining is a vital economic engine, contributing **\$23.8 billion to the province's gross domestic product** in 2023, representing almost 3% of the total.
- Gold prices hit record highs of over \$4,150 (CAD) or \$2,900 (USD) per troy ounce in early 2025. **Ontario produced almost 90 tonnes of gold** in 2023, about 3% of global production. Gold reserves increased by 165% between 2000 and 2023.
- **Ontario produced \$6.4 billion of critical minerals** at nine mines and ten processing facilities in 2023. There are more than 25 advanced critical minerals projects that include processing, recycling and exploration.
- **More than \$5 billion was spent** to buy, build and upgrade mining assets in 2023.
- **Ontario exported \$64 billion** in mineral and metals products in 2023, including \$42 billion to the United States. Ontario **imported \$77 billion** in minerals and metals products, including \$41 billion from the United States.
- In 2023, **\$976 million was invested in mineral exploration** and deposit appraisal in Ontario, 23% of total exploration spend across Canada. At the end of 2024, there were 364,531 active mining claims in Ontario with the Ring of Fire being a pivotal region for future growth.
- The broader mining sector **employs almost 150,000 people** in Ontario. The average compensation in mineral extraction is almost double the average for all industries, at **\$149,661 per year**.
- Safety is a core value of Ontario's miners. Since 2020, the lost time injury rate for mining, quarrying and oil and gas extraction has **averaged 17% below the all-industry rate**.
- The mining industry has a significantly **higher Indigenous representation** in its workforce at 12% in 2023-2024, compared to 3% across Ontario's overall workforce.
- The industry engages across **142 active agreements with Indigenous communities** promoting shared economic value and community development. These include exploration and impact benefit agreements, and government resource revenue sharing.
- Miners are leaders in innovation and sustainability, **adopting clean technologies at a rate well ahead** of the all-industry standard, including pioneering the industrial use of autonomous trucks and battery-electric vehicles.



Mines Across Ontario

Photo: IAMGOLD Côté Mine

Ontario Mining Operations, 2024

- ▶ There are 36 active mining operations in Ontario.
- ▶ The province is home to 18 gold mines; eight base metal mines (including nickel, copper, zinc, and cobalt); one iron mine; one platinum group metals (PGM) mine; and eight other major industrial mineral operations.
- ▶ Ontario is made up of five geological provinces: Hudson, Superior, Grenville and Southern in the Canadian Shield; and the St. Lawrence platform.
- ▶ The Superior geological province extends in a U-shape from Minnesota through Ontario to Quebec. It contains significant mineral deposits, including most of Ontario's gold mines.
- ▶ The Southern province extends in a narrow band between Sudbury and Cobalt, Ontario. The Sudbury basin contains important deposits of nickel, copper and other metals.
- ▶ The Michigan Basin in the St. Lawrence lowlands is found under Lake Huron and Lake Erie. Evaporating salty water left large salt deposits that are now mined along the coasts of the lakes. The St. Lawrence platform also contains other sources of industrial minerals.

- Gold
- Base Metals
- Industrial Minerals
- Iron
- Platinum Group Metals



Mines in Ontario

Gold

Mine	Owner	Type
Bell Creek	Pan American Silver Corp./ Lake Shore Gold Corp.	Underground, concentrator
Fox Complex	McEwen Mining Inc.	Open-pit, underground, concentrator
Borden	Newmont Corporation*	Open-pit, underground
Côté Gold	IAMGOLD	Open-pit
Detour Lake	Agnico Eagle Mines Limited	Open-pit, concentrator
Eagle River	Wesdome Gold Mines Ltd.	Underground, concentrator
Greenstone	Equinox Gold	Open-pit, concentrator
Hollinger	Newmont Corporation*	Open-pit
Hoyle Pond	Newmont Corporation*	Underground
Island Gold	Alamos Gold Inc.	Underground, concentrator
Macassa	Agnico Eagle Mines Limited	Underground, concentrator
Magino	Alamos Gold Inc.	Open-pit, concentrator
Musselwhite	Orla Mining Ltd.	Underground, concentrator
Rainy River	New Gold Inc.	Open-pit, underground, concentrator
Red Lake	Evolution Mining Ltd.	Underground, concentrator
Timmins West	Pan American Silver Corp./ Lake Shore Gold Corp.	Underground
Hemlo (Williams)	Barrick Gold Corporation	Open-pit, underground, concentrator
Young-Davidson	Alamos Gold Inc.	Underground, concentrator

*Discovery Silver Corp. acquisition date projected for March 31, 2025



Industrial Minerals

Mine	Owner	Type
Blue Mountain	Covia Canada Ltd.	Open-pit, plant
Goderich Mine	Compass Minerals Canada Corporation	Underground, plant
Goderich Plant	Compass Minerals Canada Corporation	Underground, plant
Hagersville	CGC Inc.	Underground, plant
Ojibway	Windsor Salt Ltd.	Underground
Penhorwood	Magris Talc Canada Inc.	Open-pit
St. Lawrence	Canadian Wollastonite	Open-pit
Windsor Salt	Windsor Salt Ltd.	Solution mining

Base Metals

Mine	Owner	Type
Kidd Creek	Glencore Canada Corporation	Underground, concentrator
McCreedy West	KGHM	Underground
Sudbury operations: Coleman, Copper Cliff, Creighton, Garson, Totten	Vale S.A.	Underground
Fraser	Glencore Canada Corporation	Underground

Iron

Mine	Owner	Type
Tomclid	Ferromin Inc.	Open-pit

Platinum Group Metals

Mine	Owner	Type
Lac des Iles	Impala Canada Ltd.	Open-pit, underground, concentrator

Source: Ministry of Mines, Natural Resources Canada's Minerals and Mining Map.

Mineral Production

Photo: Redpath



Ontario Mineral Production

Key Observations

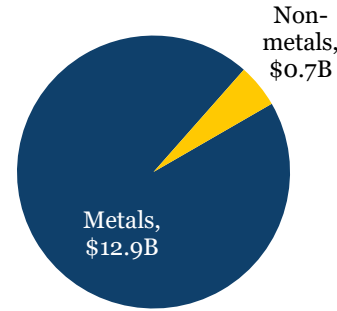
Production Value

- ▶ Total provincial mining production was valued at **\$15.7 billion** in 2023, an increase from \$10.2 billion in 2013.
- ▶ Ontario's metallic minerals production was worth **\$12.9 billion** in 2023, which accounted for about a third of Canada's total production value. Gold was the highest value metal produced (\$6.5 billion), followed by nickel (\$2.5 billion)
- ▶ Ontario's non-metallic minerals production was valued at **\$702 million** in 2023.

Production Volume

- ▶ Ontario's metallic minerals production volume totalled **286,000 tonnes** in 2023. The highest volume metal was copper, followed by nickel and cobalt.
- ▶ Ontario's non-metallic minerals production volume was **89,000 tonnes** in 2023, almost entirely from soapstone, talc and pyrophyllite.

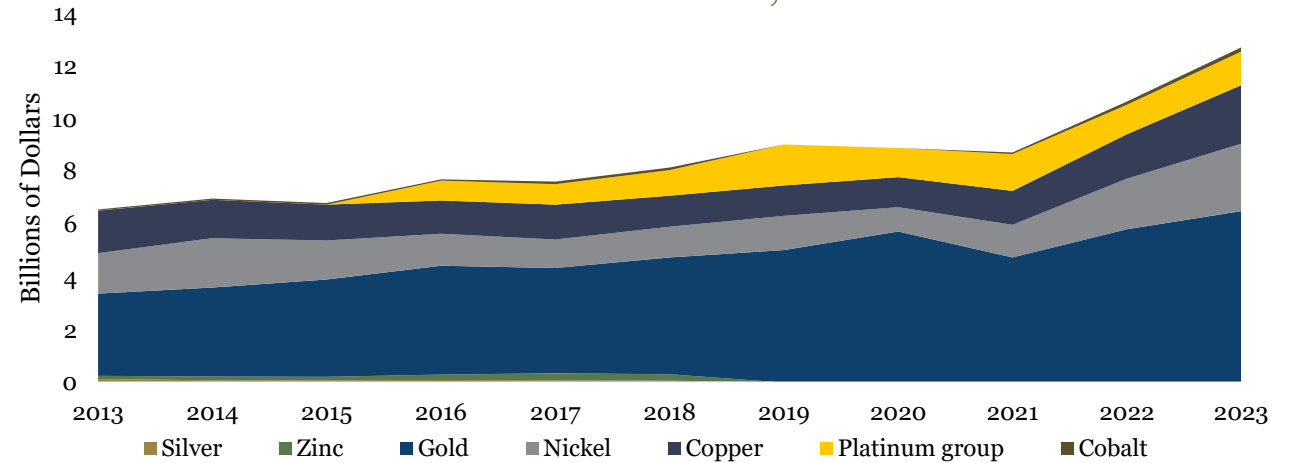
Value of Mineral Production, 2023



Selected Ontario Metallic Minerals Production 2023

Cobalt	1,701	Tonnes
Copper	221,846	Tonnes
Gold	2.9 million	Troy Ounces
Nickel	62,524	Tonnes
Platinum group	537,000	Troy Ounces
Silver	4.4 million	Troy Ounces

Ontario Metallic Minerals Value, 2013-2023

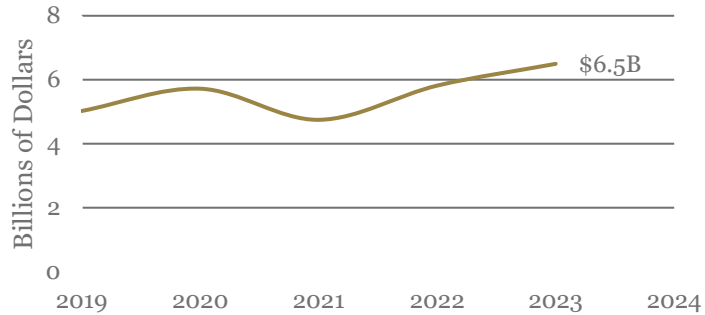


Sources: Natural Resources Canada, Annual Statistics of Mineral Production. Mining production value of \$15.7 billion includes \$0.7 billion of non-metals, \$12.9 billion in metals, and \$2.1 billion in aggregates (not shown in charts).

Natural Resources Canada's estimates for 2023 are preliminary and subject to revision.

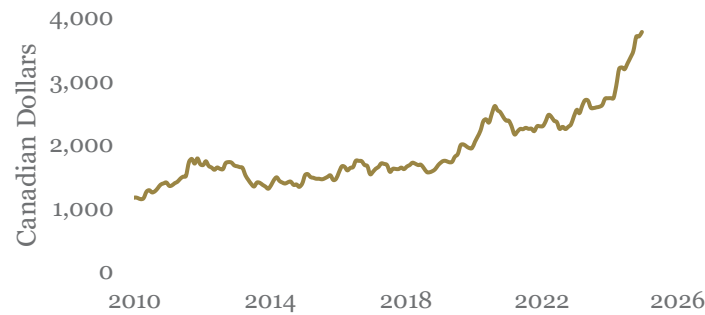
Gold Mining in Ontario

Ontario Gold Production Value, 2019-2023



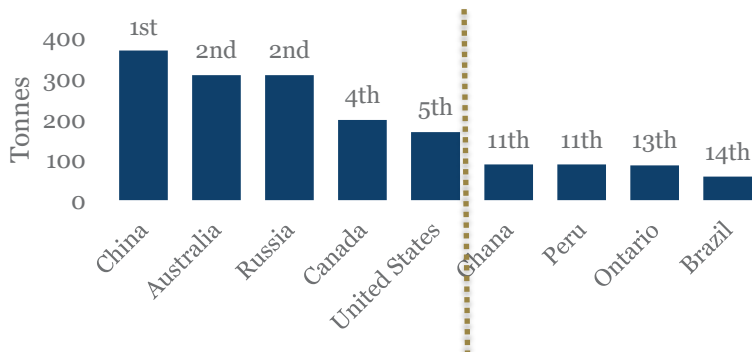
Source: Natural Resources Canada, Annual Statistics of Mineral Production

World Gold Price (CAD per troy ounce)



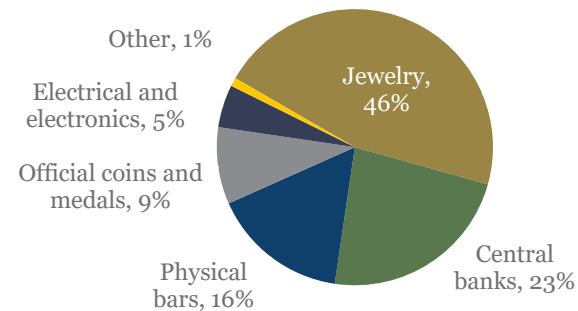
Source: World Gold Council

Ontario Gold Production, Tonnes vs Global Leaders



United States Geological Survey, Mineral Commodity Summaries, Gold, January 2024 and NRCan Annual Statistics of Mineral Production

Gold Consumption, Global Market



United States Geological Survey, Mineral Commodity Summaries, Gold, January 2024

Key Observations

- ▶ Ontario produced 88.9 tonnes (2.86 M troy ounces) of gold in 2023, about 45% of the total produced in Canada and about 3% of total global production.
- ▶ The world gold price rose more than 225% between the beginning of 2010 and the end of 2024 in Canadian dollar terms.
- ▶ Gold prices hit record highs in 2024. Global tensions, geopolitical uncertainties, inflation and other economic concerns drove investors toward the precious metal, while central banks added to the momentum with aggressive buying.
- ▶ High prices continued in early 2025, with record highs reached in January and February. Prices rose to over USD 2,900 (C\$4,150) per troy ounce.
- ▶ Increases in demand from emerging market central banks is expected to continue to push demand.
- ▶ If Ontario was a country, it would rank 13th in global gold production, just behind Peru and Ghana.
- ▶ Eighteen of the 36 mines in Ontario are gold mines. There are also 12 advanced gold exploration projects.
- ▶ Ontario has more than 30 mineral deposits each having more than 500,000 troy ounces of gold in reserves.

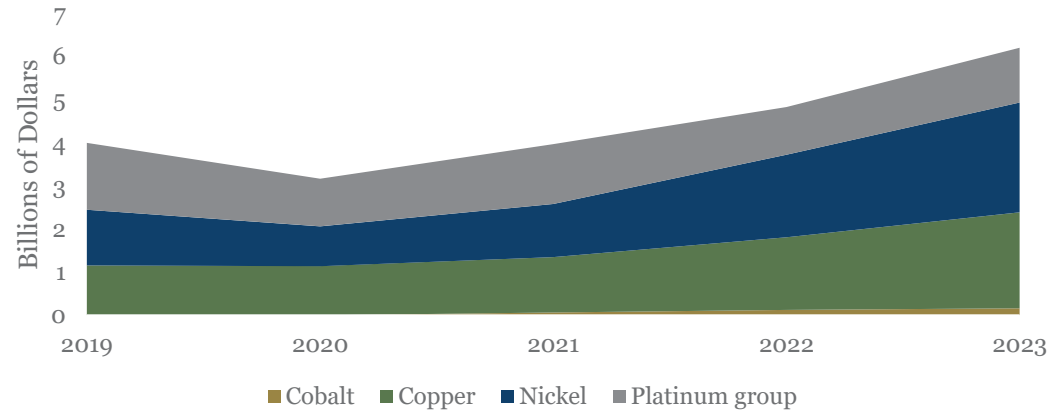
Critical Minerals

Key Observations

- ▶ In recent years, government and market interest has focused on critical minerals. These minerals are not easily substituted and may have few, concentrated global sources.
- ▶ Securing critical minerals is critical to the defence strategy of both Canada and the United States. Critical minerals are key components of alloys in vehicles and armour, in high-temperature applications like jet engines, and in missiles and rockets.
- ▶ Critical minerals are important for clean technologies like wind turbines and electric vehicles. Green energy sources require more critical minerals than fossil fuel generation of the same capacity.
- ▶ The top four critical minerals by production value on Ontario's list are nickel, copper, platinum group metals, and cobalt. In 2023, the total value of production for these four metals was \$6.2 billion.
- ▶ Demand for critical minerals is expected to increase rapidly, primarily due to green technology. Nickel demand from clean technology in 2040 is expected to be 14 times what it was in 2021. Cobalt (7x) and copper (3x) are expected to see similar increases.

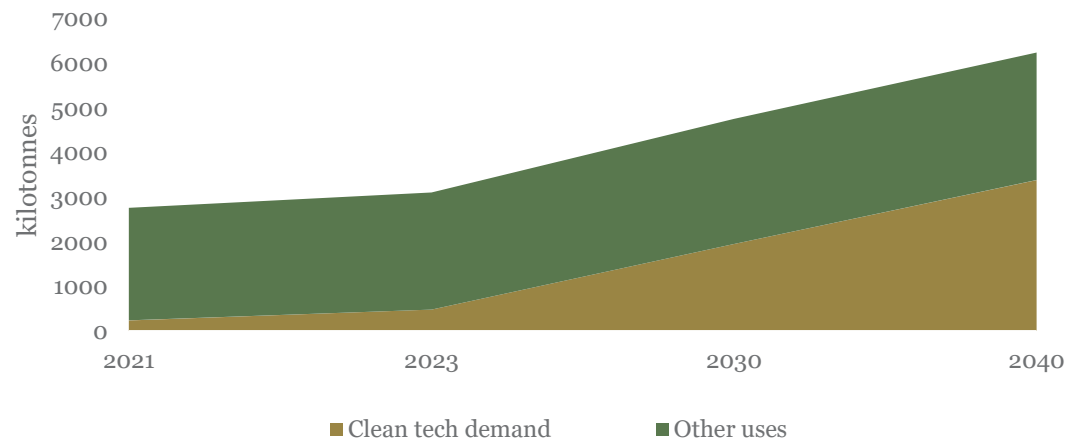


Annual Production Value, Top 4 Critical Minerals



Source: Natural Resources Canada, Annual Statistics of Mineral Production

Projected Global Nickel Demand



Source: International Energy Agency, Global Critical Minerals Outlook 2024

Critical Minerals Mines, Processing Facilities and Advanced Projects

Key Observations

- ▶ There are nine operating mines in Ontario that produce critical minerals. These mines produce cobalt, copper, indium, nickel, platinum group metals, selenium, tellurium and zinc among other metals.
- ▶ Ten facilities in Ontario process critical minerals. These smelters, mills, refineries, conversion facilities and plants take inputs from mines and recycling facilities and transform them for further processing or for use in manufacturing.
- ▶ Advanced critical mineral projects include exploration, processing, and recycling. Target metals and minerals include cesium, chromite, cobalt, copper, graphite, lithium, nickel, niobium, phosphate, rare earth elements, tantalum, tin and zinc.
- ▶ Advanced critical minerals projects include several in the Ring of Fire. The area contains significant critical mineral deposits including nickel, copper, platinum and chromite.

- Mine
- Processing Facility
- Advanced Project



Critical Minerals Mines and Processing Facilities

Mines

Mine	Owner	Commodity
Coleman	Vale S.A.	Nickel, copper, platinum group metals, gold, silver, cobalt, selenium, tellurium
Copper Cliff Complex	Vale S.A.	Nickel, copper, platinum group metals, gold, silver, cobalt, selenium, tellurium
Creighton	Vale S.A.	Nickel, copper, platinum group metals, gold, silver, cobalt, selenium, tellurium
Fraser	Glencore Canada Corporation	Nickel, copper, platinum group metals, gold, cobalt, silver
Garson	Vale S.A.	Nickel, copper, platinum group metals, gold, silver, cobalt, selenium, tellurium
Kidd Creek	Glencore Canada Corporation	Copper, zinc, silver, selenium, indium
Lac des Iles	Impala Canada Ltd.	Platinum group metals, gold, nickel, copper, cobalt
McCreedy West	KGHM	Copper, nickel, platinum group metals, gold, silver, cobalt, tellurium
Totten	Vale S.A.	Nickel, copper, platinum group metals, gold, silver, cobalt

Processing Facilities

Facility	Owner	Commodity	Type
Blind River	Cameco Corporation	Uranium (trioxide)	Refinery
Clarabelle	Vale Canada Limited	Nickel, copper, platinum group metals, gold, silver, cobalt, selenium, tellurium	Mill
Copper Cliff Complex	Vale S.A.	Nickel (oxide sinter, pellets, powder, sulfide), copper cathodes, gold, silver, selenium cake, tellurium dioxide cake, platinum group metals (in residues), liquid sulfur dioxide, sulfuric acid	Smelter, refinery, plant
Mississauga	Real Alloy Canada Ltd.	Recycled aluminum	Secondary smelter
Neo Performance Materials ULC	Neo Performance Materials Inc.	Gallium, indium	Secondary refinery
Ottawa Plant	Masterloy Products Limited	Ferrovandium, ferromolybdenum	Ferroalloy plant
Port Colborne	Vale S.A.	Electrolytic cobalt, platinum group metals (in residues)	Refinery
Port Hope	Cameco Corporation	Uranium (hexafluoride, dioxide, metals, alloys)	Conversion facility
Strathcona	Glencore Canada Corporation	Nickel, copper, platinum group metals, gold, silver, cobalt, selenium, tellurium	Mill
Sudbury	Glencore Canada Corporation	Nickel-copper matte containing cobalt, gold, silver, platinum group metals	Smelter, plant

Source: Natural Resources Canada's Critical Minerals Map

Critical Minerals Projects

Project	Owner	Commodity	Project Type
Albany	Zentek Ltd.	Graphite	Advanced project
Battery Materials Park	Electra Battery Materials Corporation	Cobalt, nickel, lithium	Advanced processing project
Bissett Creek	Northern Graphite Corporation	Graphite	Advanced project
Crawford	Canada Nickel Company Inc.	Nickel, iron ore, cobalt, palladium, platinum, chromite	Advanced project
Crean Hill	Magna Mining Inc.	Nickel, copper, cobalt, platinum, palladium, gold	Advanced project
Eagle's Nest	Wyloo Pty Ltd	Nickel, copper, gold, platinum, palladium	Advanced project
Georgia Lake	Rock Tech Lithium Inc.	Lithium (spodumene)	Advanced project
Kearney	G6 Energy Corp.	Graphite	Past producer
Kenbridge	Tartisan Nickel Corp.	Nickel, copper, cobalt	Advanced project
Lake Superior plant	Avalon Advanced Materials Inc.	Lithium hydroxide	Advanced processing project
Lithium Hydroxide Refinery	Rock Tech Lithium Inc.	Lithium hydroxide	Advanced processing project
Lithium Refinery	Frontier Lithium Inc.	Lithium hydroxide, lithium carbonate	Advanced processing project
Marathon	Generation Mining Limited	Palladium, platinum, gold, copper, silver	Advanced project
Markham lithium reprocessing facility	Arcadium Lithium PLC	Lithium metal	Advanced processing project
Martison	Fox River Resources Corp.	Phosphate, niobium	Advanced project
Nickel processing plant	Canada Nickel Company Inc.	Nickel	Advanced processing project
Onaping Depth	Glencore Canada Corporation	Nickel, copper, cobalt, platinum, palladium, rhodium, gold, silver	Advanced project
PAK	Frontier Lithium Inc.	Lithium (spodumene), tantalum, tin, niobium, rubidium, cesium	Advanced project
Raleigh	International Lithium Corporation	Lithium (spodumene), rubidium	Advanced project
RapidSX Demonstration Plant	Ucore Rare Metals Inc.	Rare earth elements	Demonstration plant
River Valley	New Age Metals Inc.	Palladium, platinum, gold, nickel, copper, rhodium, cobalt	Advanced project
Separation Rapids	Avalon Advanced Materials Inc.	Lithium (petalite), tantalum	Advanced project
Seymour Lake (Root Lake)	Green Technology Metals Limited	Lithium (spodumene), tantalum	Advanced Project
Shakespeare	Magna Mining Inc.	Nickel, copper, palladium, platinum, gold, cobalt	Advanced project
Stainless Steel and Alloy Processing Facility	Canada Nickel Company Inc.	Nickel alloys, chromium alloys, stainless steel	Advanced processing project
Stobie	Vale S.A.	Nickel, copper, platinum group metals, gold, silver, cobalt, selenium, tellurium	Advanced Project
Superior Lake	Frontier Energy Limited	Zinc, copper, gold, silver	Advanced project
Thierry	OreCAP Invest Corp.	Copper, nickel, silver, gold, platinum, palladium	Advanced project
Thunder Bay North	Clean Air Metals Inc.	Platinum, palladium, gold, nickel, copper, silver	Advanced project
Thunder Bay Plant	Green Technology Metals Limited	Lithium hydroxide	Advanced processing project
Upper Beaver	Agnico Eagle Mines Limited	Gold, copper	Advanced project
Victoria	KGHM Polska Miedz	Nickel, copper, gold, cobalt, platinum, palladium	Advanced project

Source: Natural Resources Canada's Critical Minerals Map

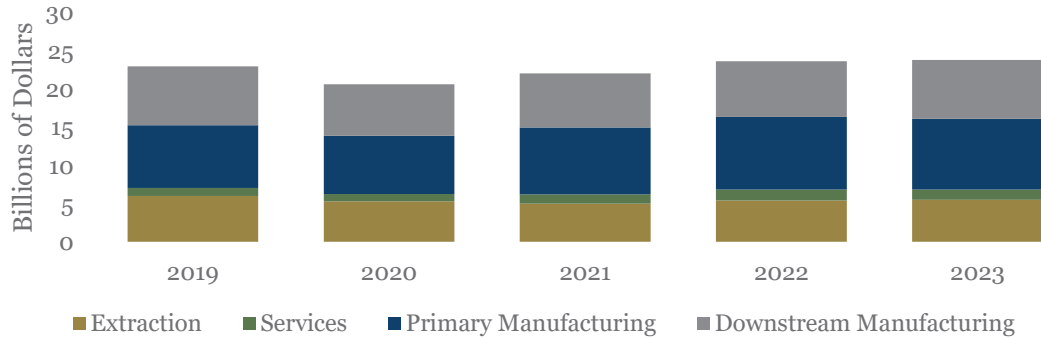
GDP, Investment & Trade

Photo: Glencore Sudbury Integrated Nickel Operations



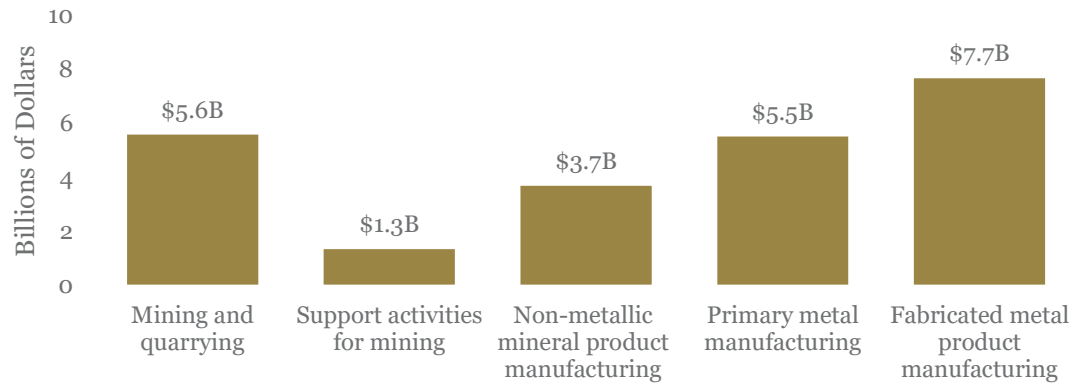
Gross Domestic Product

GDP Contribution, Mining in Ontario 2019-23



Source: Statistics Canada, Gross Domestic Product by Industry, Chained 2017 Dollars

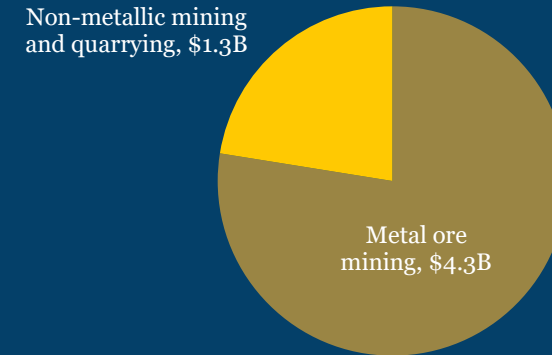
Gross Domestic Product (GDP) Contribution, Mining in Ontario 2023



Source: Statistics Canada, Gross Domestic Product by Industry, Chained 2017 Dollars



GDP Contribution, Extraction, 2023



Source: Statistics Canada, Gross Domestic Product by Industry, Chained 2017 Dollars

Key Observations

- ▶ In 2023, the mining industry and associated sectors directly contributed **\$23.8 billion** to Ontario's GDP, or about 2.8% of the total.
- ▶ Extraction made up \$5.6 billion of Ontario's GDP, services \$1.3 billion, primary manufacturing \$9.2 billion and downstream manufacturing \$7.7 billion.
- ▶ Except for the pandemic year of 2020, between 2019 and 2024, Ontario's mining industry contributed more than \$22 billion to the economy each year.
- ▶ Metal ore mining contributed **78%** of GDP from extraction in 2023.
- ▶ Indirect contributions to Ontario's GDP from the mining sector can be expected to add another 35%, or \$8 billion to the economy.

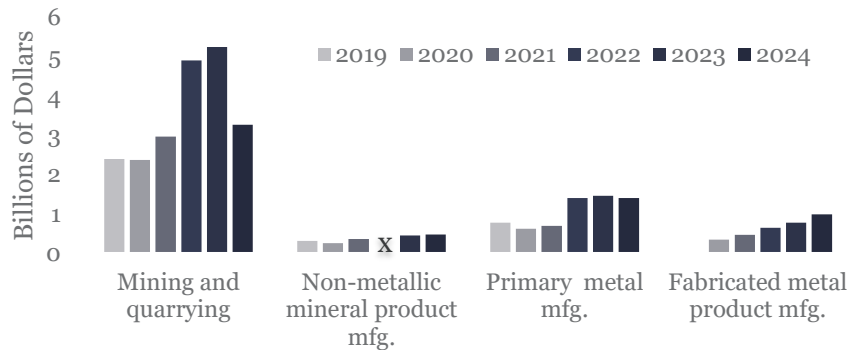
Investment

Key Observations

- ▶ Capital expenditures (money spent to buy, build or upgrade mining assets) rose from \$4.9 billion in 2022 to \$5.2 billion in 2023. Intentions for 2024 were slightly lower, at \$3.3 billion.
- ▶ Capital expenditures were up substantially in all mining subsectors between 2021 and 2023: from 10% in mining and quarrying to 112% in fabricated metal product manufacturing.
- ▶ In 2023, Ontario mine complex development expenditures were \$896 million.

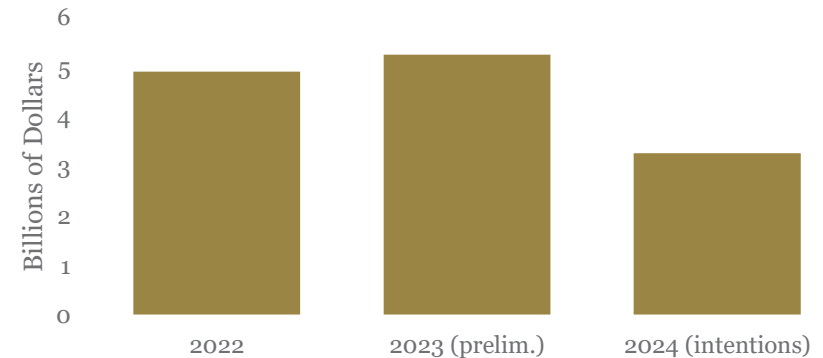


Capital Expenditures, Mining Industry Subsectors, 2023



Source: Statistics Canada, Table 34-10-0035-01. 2023 expenditures are preliminary, 2024 numbers are intentions. Data for non-metallic mineral product manufacturing were too unreliable to be published for 2022 (marked with an "x").

Capital Expenditures, Mining and Quarrying 2023



Source: Natural Resources Canada, Capital Expenditures Information Bulletin

Community Investments

Photo: Impala Canada

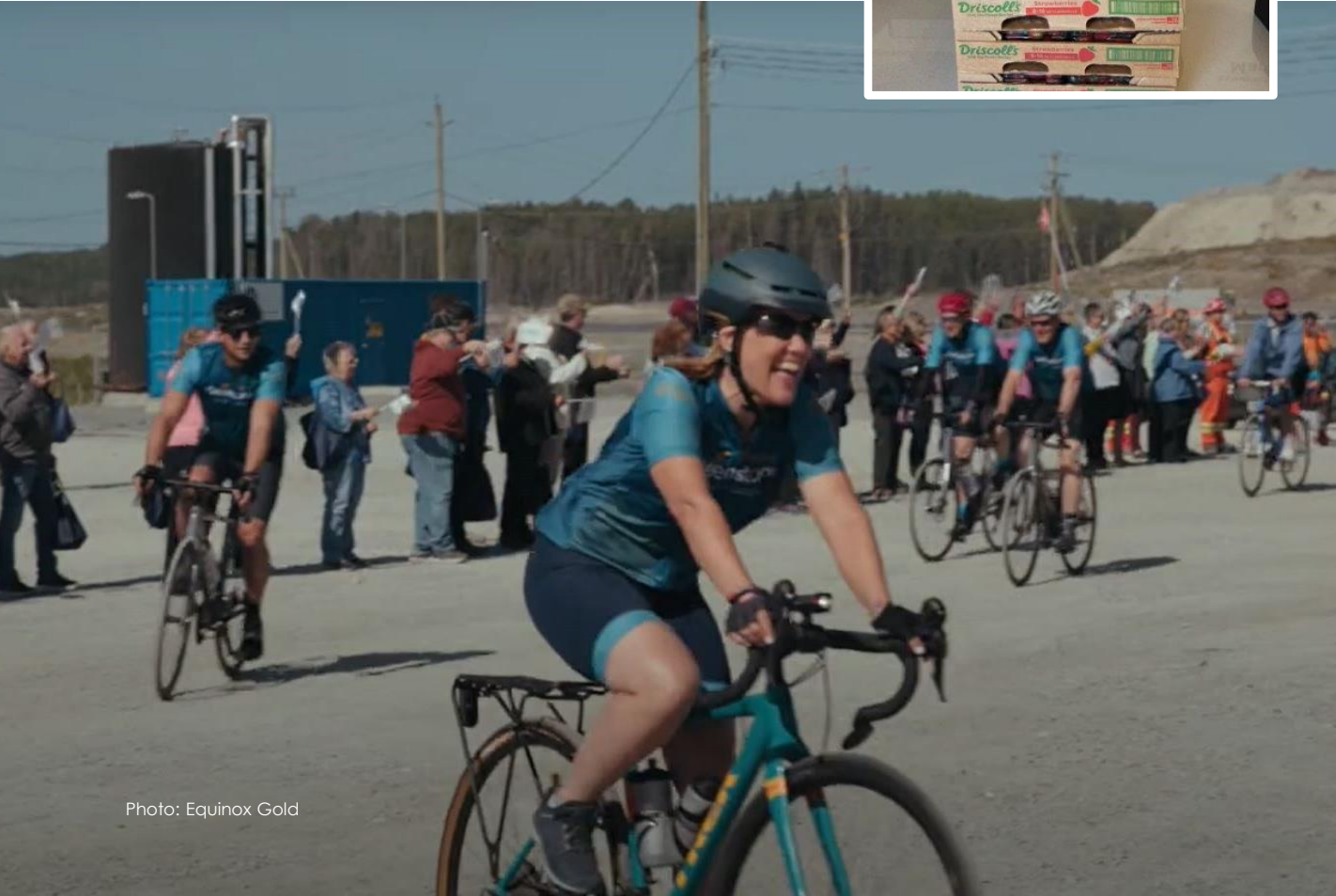


Photo: Equinox Gold

- ▶ Mining operations in Ontario are committed to improving their local communities by reinvesting in important social programs
 - In 2024, Lake Shore Gold, a subsidiary of Pan American Silver made donations to the Timmins District Hospital, Rock on the River, Mattagami Region Conservation Authority, local food banks as well as several other community events and partners.
 - Equinox Gold's Ride to Greenstone fundraising event raised \$1,340,784 for the Geraldton District Hospital, which provides care to approximately 5,700 residents in Northern Ontario, including five Indigenous communities and the Greenstone Mine workforce.¹
 - A significant portion of Impala Canada's \$375K investment with Roots Community Food Centre goes to support Roots' Food Markets hosted in remote, Indigenous communities as well as in Thunder Bay proper. One of Roots' busiest markets uses Impala Canada's support to lower food prices for quality, affordable fruits and vegetables and eggs by 30%. Impala Canada's funding both subsidizes food costs as well as supports the cost of labour and market logistics. About 500 families received a 11lb carton of strawberries in the summer of 2024 – an always popular, yet expensive food item.²

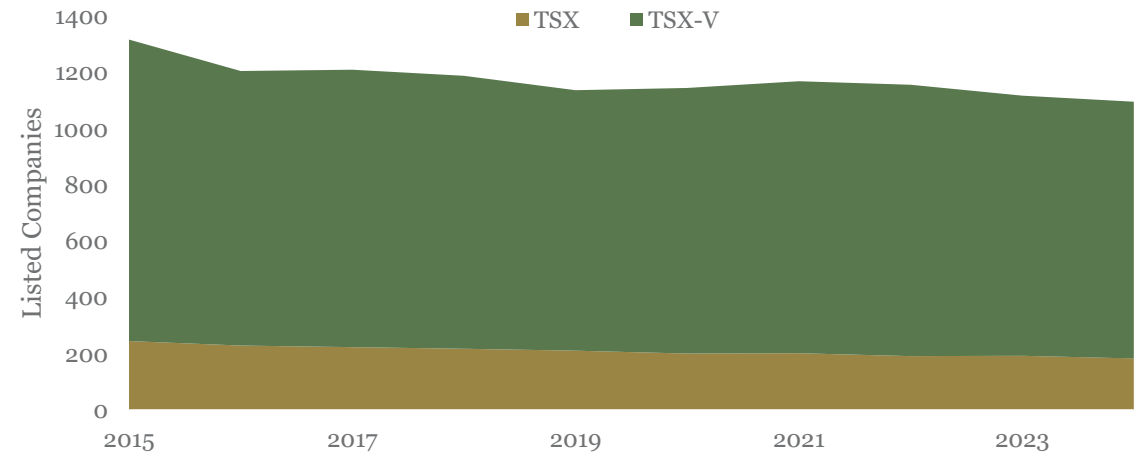
1. [Equinox Gold completes the Ride to Greenstone, raising over C\\$1.34 million for Geraldton District Hospital.](#)
2. [Impala Canada Invests \\$375,000 in Roots to Harvest to Harness the Power of Food in Building Stronger Communities.](#) November 3, 2021.

Access to Capital

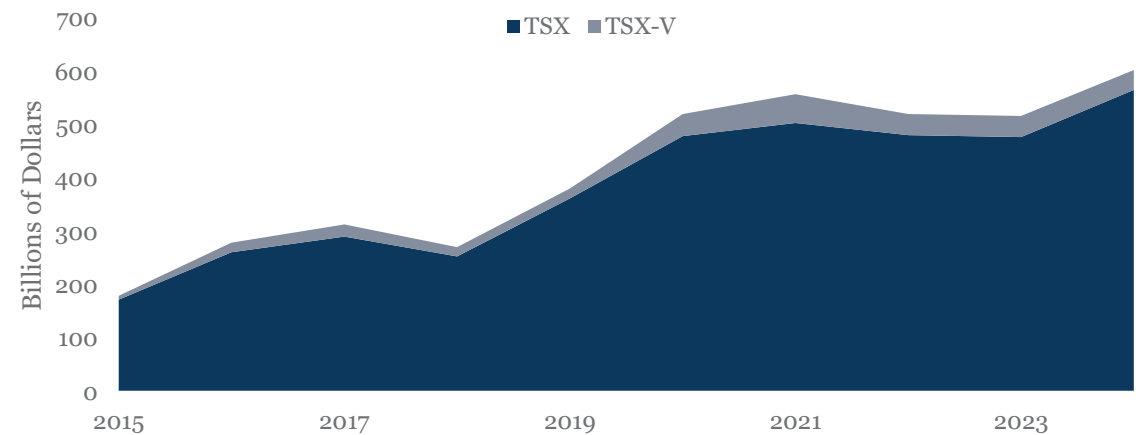
Key Observations

- ▶ Ontario is the leading global centre for mining finance. The Toronto Stock Exchange (TSX) and TSX Venture Exchange (TSX-V) list about 40% of the world's publicly traded mining companies.
- ▶ At the end of 2024, 1,097 of the firms listed on the TSX and TSX-V were mining companies. After a steady decline in the middle of the last decade, listings have been relatively stable since 2020.
- ▶ Companies listed on the TSX and TSX-V had a combined market value of \$603 billion at the end of 2024. This is 12% of the value of both exchanges, and more than triple their market value at the end of 2015.
- ▶ The two markets have a global audience: more than 250 analysts cover mining companies listed on the exchanges, and approximately 40% of all trading originates outside of Canada. In 2023, the TSX and TSX-V were responsible for almost a quarter of mining capital raised globally.
- ▶ Due to their global audience, access to investors, and liquidity, Canadian exchanges have traditionally been the most desirable location for initial public offerings for mining companies.

Mining Company Listings, TSX and TSX-V



Total Mining Sector Market Value, TSX and TSX-V



Source: TMX Market Intelligence Reports for the years 2015 through 2024.

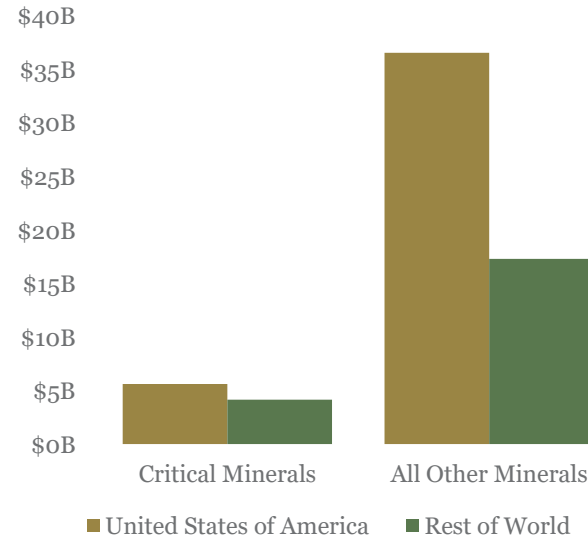
Ontario's Mineral Exports

Key Observations

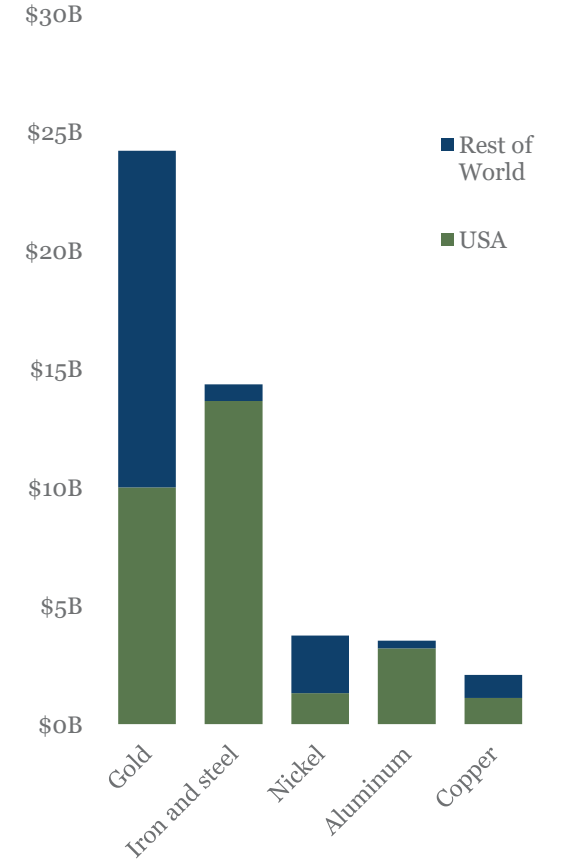
- ▶ Ontario's minerals and mining sector exported \$64 billion of goods to the world in 2023.¹ This represents about a quarter of all of Ontario's goods exports for 2023.
- ▶ Mineral products are divided into four stages, depending on the amount of processing required. Stage 1 (primary) products include ore and metal scrap, Stage 2 (smelting/refining) products are the relatively pure metals resulting from metallurgical processing, Stage 3 (semi-fabricated) products require further processing as inputs to other industries, and Stage 4 (fabricated) produces final products. Imports and exports discussed here include all four stages.
- ▶ The largest destination for Ontario's mineral exports was the United States, at \$42 billion. Fifty-seven per cent of critical minerals exports and 68% of other mineral exports went to the USA.
- ▶ Ontario's largest mineral export in 2023 was gold, with a total export value of \$24 billion. Exports to the United States were \$10 billion, \$8 billion to the United Kingdom and \$3.5 billion to Hong Kong.
- ▶ The largest destination states in the United States for Ontario exports in 2023 were New York (\$7.7B), Michigan (\$5.1B), Illinois (\$5.0B), and Indiana (\$3.2B).

1. "Exports" here refers to domestic exports, i.e., goods produced and manufactured in Canada. This category excludes goods that were previously imported to Canada and are leaving in the same condition in which they were imported.
 2. The source for trade data on this page is Natural Resources Canada and Statistics Canada.

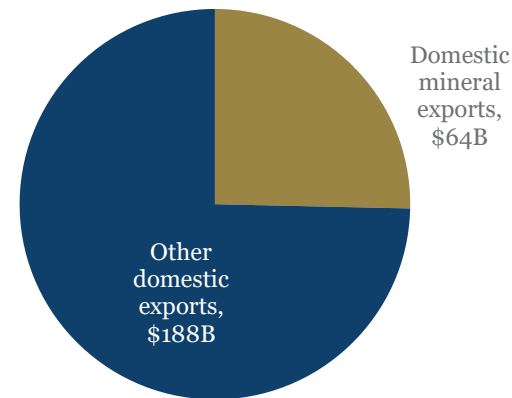
Ontario Exports by Destination, 2023²



Ontario Exports by Type, 2023²



Mineral Exports and Total Exports, 2023²

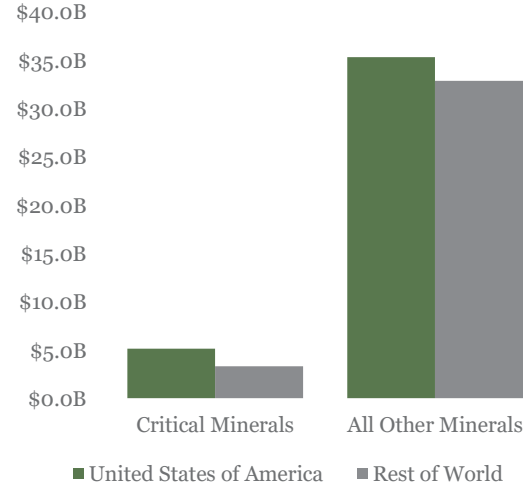


Ontario's Mineral Imports

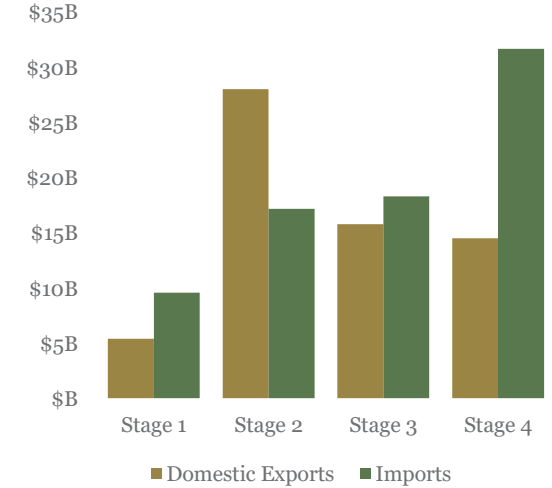
Key Observations

- ▶ Ontario imported \$77 billion worth of mineral and metal goods in 2023. The largest import was iron and steel (\$20 billion), followed by gold (\$17 billion), aluminum (\$4.5 billion) and copper (\$2.8 billion).^{1, 2}
- ▶ The largest source of Ontario's mineral and metals goods imports was the United States, with a value of \$40.6 billion in 2023. These imports included \$5.2 billion of critical minerals products.
- ▶ Ontario exports more of the products that require less processing (Stages 1 and 2) and imports more of the products that require more processing (Stages 3 and 4)
- ▶ Ontario imports \$41 billion worth of mineral and metals products from the United States. Texas (primarily gold), Michigan, Ohio and Pennsylvania (where the largest import category were Stages 3 and 4 iron and steel); and New York (aluminum, iron and steel and gold) all exported more than \$3 billion in mineral and metal products to Ontario.

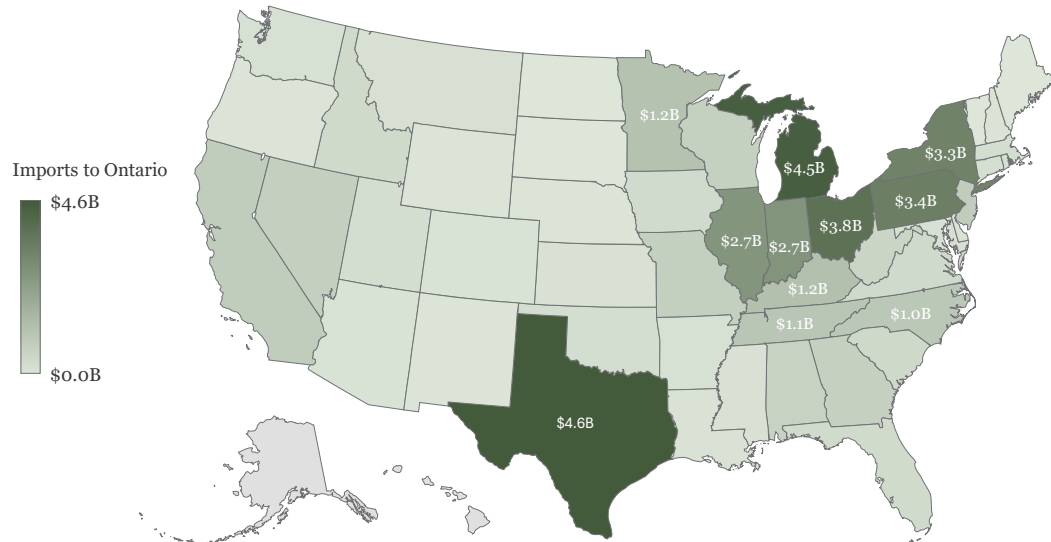
Ontario Imports by Source, 2023²



Exports and Imports by Stage, 2023²



Imports by State, 2023²



1. Statistics for imports to Ontario are based on the location in which the goods were cleared by customs either for immediate consumption in Canada or for entry into a bonded customs warehouse. This may not always coincide with actual consumption of goods in Ontario, i.e., they may subsequently be transferred to another province for use.
 2. The source for trade data on this page is Natural Resources Canada and Statistics Canada.

Ontario's Critical Mineral Imports and Exports

Mineral	Exports			Imports		
	USA Value	World Total	USA as %	USA Value	World Total	USA as %
Antimony	\$1,259,518	\$1,259,518	100%	\$4,482,216	\$26,836,394	17%
Barite and witherite	\$12,785	\$12,785	100%	\$1,705,533	\$3,147,079	54%
Beryllium	\$0	\$0		\$650,536	\$686,068	95%
Bismuth	\$17,273	\$164,659	10%	\$1,284,562	\$1,751,714	73%
Cesium	\$0	\$0		\$0	\$0	
Chromite	\$0	\$0		\$0	\$0	
Cobalt	\$57,125,117	\$176,346,666	32%	\$32,839,415	\$42,605,334	77%
Copper	\$1,144,686,648	\$2,119,567,674	54%	\$2,285,107,857	\$2,834,474,410	81%
Fluorspar	\$483,346	\$483,621	100%	\$24,303,820	\$48,168,543	50%
Gallium	\$0	\$0		\$0	\$0	
Germanium	\$0	\$0		\$7,242,369	\$8,080,270	90%
Graphite	\$21,242,335	\$23,407,309	91%	\$69,215,648	\$117,241,688	59%
Indium	\$0	\$0		\$0	\$0	
Lithium	\$99,436,673	\$102,864,633	97%	\$416,634,649	\$546,662,168	76%
Magnesium and magnesium compounds	\$65,636,238	\$66,871,296	98%	\$31,177,569	\$270,543,248	12%
Manganese	\$637,232	\$639,216	100%	\$93,716,145	\$264,469,768	35%
Molybdenum	\$1,295,618	\$1,305,674	99%	\$48,442,191	\$115,791,638	42%
Nickel	\$1,345,725,592	\$3,777,476,062	36%	\$556,088,674	\$696,785,412	80%
Niobium	\$83,714	\$83,714	100%	\$1,537,980	\$36,135,776	4%
Phosphate and phosphate compounds	\$60,613,496	\$80,367,599	75%	\$111,196,771	\$301,539,410	37%
Platinum Group Metals	\$1,630,474,297	\$2,054,576,055	79%	\$832,763,795	\$2,095,947,384	40%
Rare earth elements (REEs)	\$73,894	\$77,013	96%	\$2,531,752	\$3,352,515	76%
Scandium	\$0	\$0		\$0	\$0	
Selenium	\$275,798	\$1,215,173	23%	\$1,311,607	\$1,512,604	87%
Tantalum	\$1,836,828	\$2,011,351	91%	\$2,704,558	\$2,790,390	97%
Tellurium	\$135,130	\$135,130	100%	\$721,542	\$725,762	99%
Tin	\$2,951,802	\$2,974,730	99%	\$18,128,529	\$56,647,833	32%
Titanium metal	\$20,875,756	\$40,635,645	51%	\$100,296,915	\$146,770,430	68%
Titanium oxides	\$44,637,644	\$46,354,143	96%	\$230,548,182	\$309,046,713	75%
Tungsten	\$25,903,259	\$29,164,264	89%	\$31,866,786	\$37,017,950	86%
Uranium and thorium	\$974,798,403	\$1,196,325,468	81%	\$64,164,029	\$326,259,559	20%
Vanadium	\$60,855,216	\$60,855,277	100%	\$1,278,370	\$27,311,311	5%
Zinc	\$136,473,716	\$153,759,420	89%	\$192,750,901	\$249,316,407	77%
Zirconium	\$4,852,912	\$7,162,938	68%	\$54,795,001	\$60,295,030	91%

Trade data from Natural Resources Canada and Statistics Canada.

Ontario's Other Mineral Imports and Exports

Mineral	Exports			Imports		
	USA Value	World Total	USA as %	USA Value	World Total	USA as %
Abrasives	\$177,637,177	\$216,810,524	82%	\$238,392,566	\$485,755,002	49%
Aluminum	\$3,236,368,709	\$3,557,124,052	91%	\$3,281,632,645	\$4,466,933,431	73%
Arsenic	\$0	\$83,107	0%	\$366	\$1,811	20%
Barium	\$511,722	\$511,722	100%	\$3,308,970	\$4,441,156	75%
Boron	\$252,914	\$303,865	83%	\$11,416,089	\$13,288,956	86%
Bromine	\$686,442	\$690,363	99%	\$381,244	\$3,552,978	11%
Cadmium	\$11,179	\$11,179	100%	\$2,164,949	\$34,660,971	6%
Calcium metals	\$162,465	\$164,803	99%	\$18,688,098	\$36,167,725	52%
Cement	\$542,490,120	\$549,299,932	99%	\$325,465,277	\$508,315,234	64%
Chlorine and chlorine compounds	\$18,482,900	\$18,540,255	100%	\$118,156,238	\$130,725,561	90%
Chromium	\$3,938,943	\$3,939,146	100%	\$6,840,833	\$61,284,462	11%
Chrysotile (Asbestos)	\$954,174	\$1,542,544	62%	\$54,999,748	\$75,435,786	73%
Clay and clay products	\$21,636,005	\$34,380,835	63%	\$321,496,999	\$908,423,402	35%
Coal	\$409,494,373	\$418,175,625	98%	\$1,123,767,048	\$1,141,941,661	98%
Coke	\$54,912,775	\$80,027,590	69%	\$479,400,435	\$500,081,854	96%
Diamonds	\$17,853,625	\$83,463,014	21%	\$23,149,977	\$186,296,465	12%
Dolomite	\$42,224,574	\$42,231,653	100%	\$3,964,326	\$4,033,746	98%
Feldspar	\$0	\$5,638	0%	\$411,979	\$436,984	94%
Glass and glassware products	\$377,070,109	\$423,613,465	89%	\$1,901,708,443	\$2,780,322,866	68%
Gold	\$10,032,086,658	\$24,226,962,805	41%	\$5,200,852,086	\$17,137,259,238	30%
Granite	\$22,117,829	\$22,714,791	97%	\$4,144,743	\$30,907,025	13%
Gypsum	\$44,901,979	\$45,520,112	99%	\$95,983,805	\$101,620,136	94%
Hafnium	\$0	\$0	0%	\$2,731	\$4,252,555	0%
Helium	\$0	\$16,988,076	0%	\$0	\$28	0%
Iodine	\$252,335	\$358,707	70%	\$5,196,815	\$11,184,567	46%
Iron and steel	\$13,666,107,029	\$14,379,685,963	95%	\$12,318,662,289	\$20,046,968,922	61%
Iron ore	\$47,367	\$28,708,781	0%	\$1,042,532,453	\$1,042,538,039	100%
Lead	\$162,011,075	\$208,837,985	78%	\$667,222,530	\$882,138,740	76%

Mineral	Exports			Imports		
	USA Value	World Total	USA as %	USA Value	World Total	USA as %
Lime	\$8,320,190	\$8,320,190	100%	\$36,950,898	\$37,680,962	98%
Limestone flux and other limestone	\$4,663,558	\$4,672,722	100%	\$14,191,286	\$15,128,614	94%
Marble travertine and other calcareous stones	\$22,199,663	\$22,783,301	97%	\$10,142,517	\$59,028,002	17%
Mercury	\$163,959	\$170,901	96%	\$492,090	\$625,622	79%
Mica	\$212,262	\$223,914	95%	\$2,838,120	\$3,682,350	77%
Mineral pigments	\$110,133,660	\$113,068,068	97%	\$137,639,293	\$180,438,394	76%
Nepheline syenite	\$136,787,507	\$145,020,372	94%	\$2,390,656	\$2,415,241	99%
Olivine	\$0	\$0	0%	\$283,081	\$570,157	50%
Other metals	\$4,973,893,666	\$6,652,323,188	75%	\$5,953,724,946	\$13,229,843,963	45%
Other nonmetals	\$699,716,721	\$749,793,552	93%	\$698,655,271	\$1,410,541,371	50%
Other structurals	\$196,960,857	\$217,559,330	91%	\$125,975,953	\$202,721,391	62%
Pearls	\$25,352	\$37,551	68%	\$8,314,797	\$46,930,189	18%
Peat	\$35,439,944	\$35,634,878	99%	\$4,490,891	\$7,638,671	59%
Perlite	\$0	\$0	0%	\$7,861,532	\$7,868,418	100%
Potash and potassium compounds	\$1,726,983	\$1,822,873	95%	\$88,752,088	\$116,712,780	76%
Rhenium	\$2,351,245	\$3,250,743	72%	\$4,043	\$4,043	100%
Salt and sodium compounds	\$202,696,009	\$211,878,625	96%	\$515,143,943	\$575,613,049	89%
Sand and gravel	\$42,678,121	\$42,678,905	100%	\$24,831,172	\$25,458,617	98%
Sandstone	\$83,852	\$83,852	100%	\$571,309	\$2,707,260	21%
Silica and silica compounds	\$24,653,150	\$26,658,993	92%	\$123,441,729	\$176,970,635	70%
Silicon	\$17,697,525	\$31,756,515	56%	\$8,523,516	\$19,910,358	43%
Silver	\$1,123,008,202	\$1,195,397,964	94%	\$350,438,863	\$1,572,400,082	22%
Slate	\$4,734,182	\$4,734,182	100%	\$1,583,489	\$3,103,135	51%
Strontium	\$0	\$0	0%	\$19,854	\$35,728	56%
Sulphur and sulphur compounds	\$113,169,085	\$113,171,562	100%	\$27,384,289	\$28,758,755	95%
Thallium	\$0	\$0	0%	\$31	\$152	20%
Talc soapstone and pyrophyllite	\$54,009,328	\$61,922,124	87%	\$10,903,369	\$13,204,163	83%

Trade data from Natural Resources Canada and Statistics Canada.

Exploration and Development

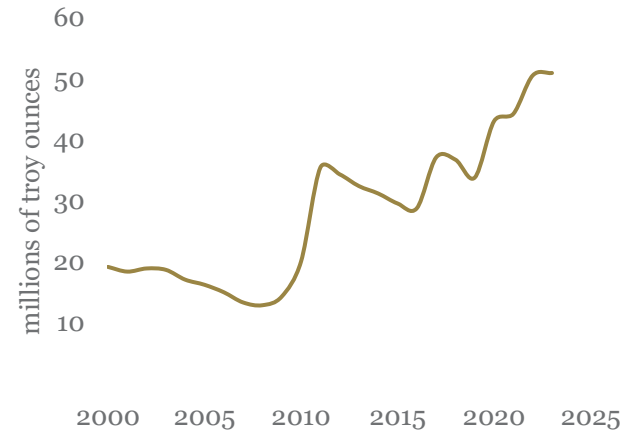
Photo: Wyloo Eagles Nest Project



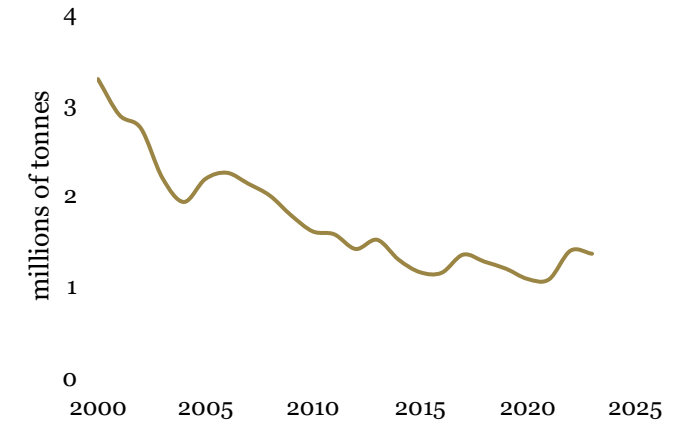
Mineral Reserves

- ▶ Exploration aims to find mineral resources that are economically viable to mine.
- ▶ Statistics Canada tracks proven and probable reserves for important minerals over time. Resources can be converted into *probable* or *proven* reserves depending on the confidence that a qualified person has in the estimates of volume and on the expected costs of extraction.
- ▶ Operational mines over time deplete known reserves; however, previously unknown or inferred resources can become known reserves through further exploration activities and deployment of innovative technologies, which may lead to the discovery of an economically viable resource.
- ▶ Gold reserves increased by 165% between 2000 and 2023.
- ▶ Nickel, copper and zinc reserves have decreased substantially over the past quarter century: nickel by 58% between 2000 and 2023, copper by 67% over the same period, and zinc by 95%.
- ▶ Increasing reserves requires consistent investment and land access for exploration and investment in assessment of resources.

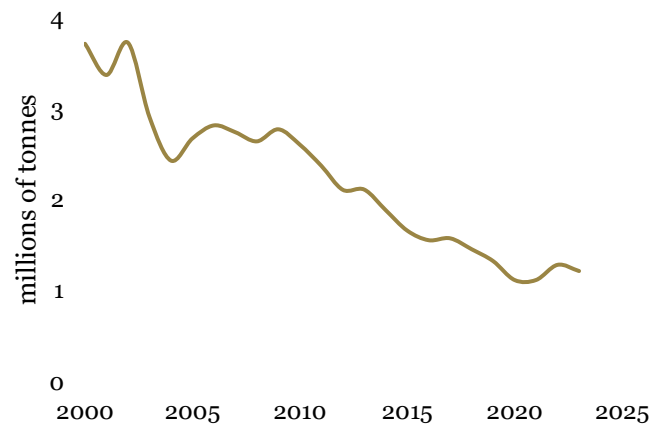
Gold Reserves



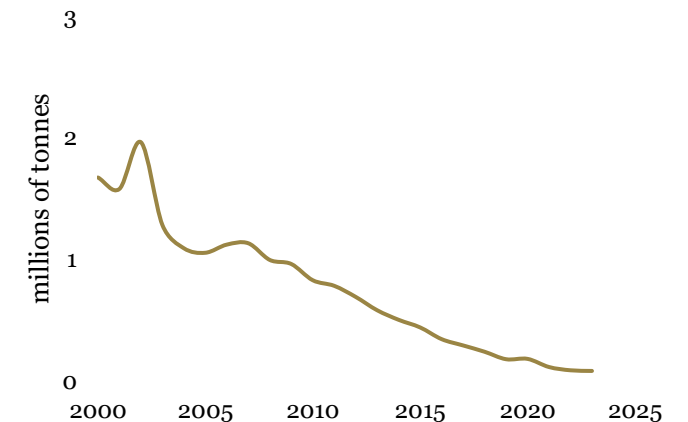
Nickel Reserves



Copper Reserves



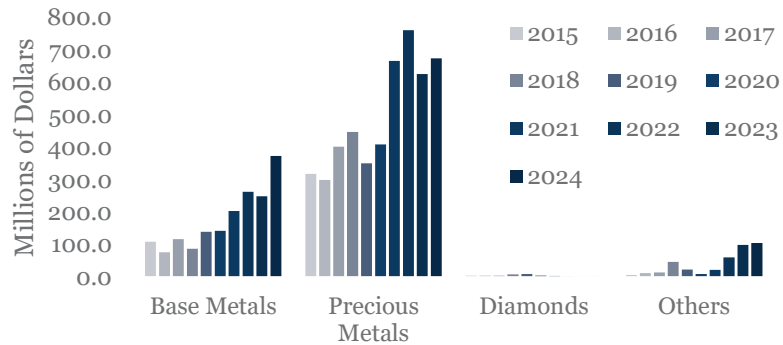
Zinc Reserves



Source: Statistics Canada Table 38-10-0007-01, Selected natural resource reserves

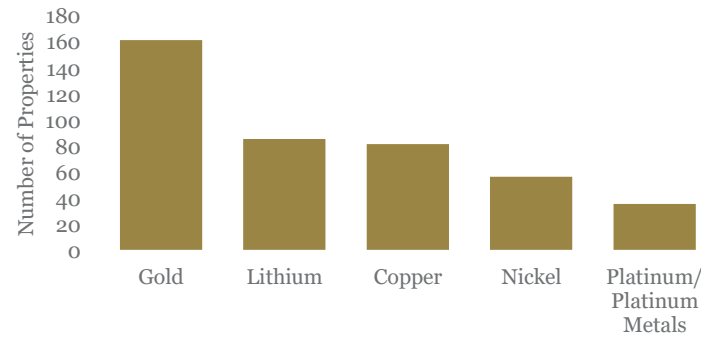
Exploration

Exploration Spending, by Commodity



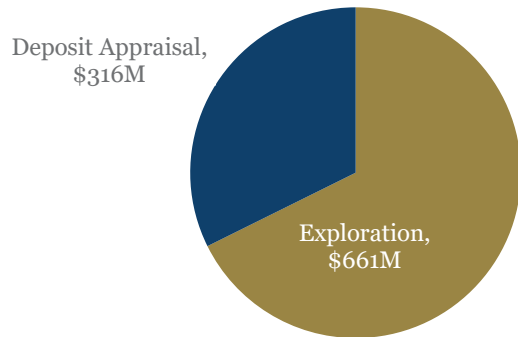
Source: Natural Resources Canada, Mineral Exploration and Development, Data Tables

Resident Geologist Reports, January-November 2024



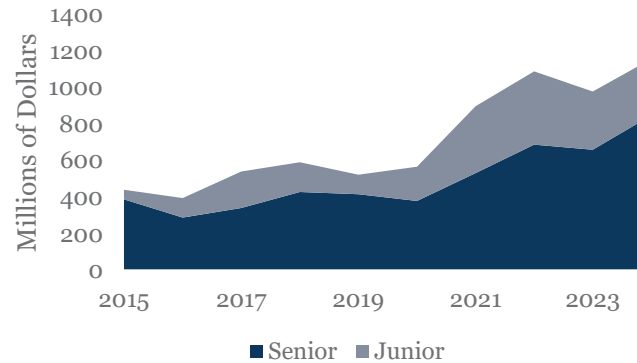
Source: Ontario Ministry of Mines, Activity Reports – Mineral Exploration

Exploration and Deposit Appraisal Spending, 2023



Source: Natural Resources Canada, Mineral Exploration and Development, Data Tables

Junior and Senior Company Exploration and Deposit Appraisal Spending



Source: Natural Resources Canada, Mineral Exploration and Development, Data Tables

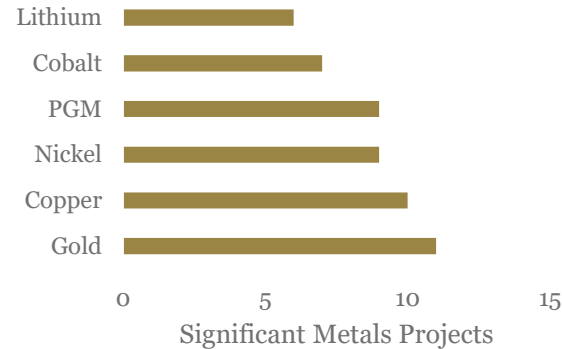
- ▶ In 2023, \$976 million was invested in mineral exploration and deposit appraisal in Ontario. Base metals (\$249M) and precious metals (\$627M) were the primary targets of exploration spending in 2023.
- ▶ At the end of 2024, there were 364,531 active mining claims in Ontario.
- ▶ As of December 2, 2024, there were 36,631 active claim cells covering 7,361 km² in the Ring of Fire, held by 14 companies and individuals as sole owners and in various joint ventures.
- ▶ The resident geologist for each of Ontario's nine districts collects and tracks reports on exploration and mining activity every year. In 2024, resident geologists tracked 318 sites. The most frequent mineral tracked was gold (162 sites), followed by lithium (86) and copper (82).
- ▶ In recent years, junior companies have been responsible for 30% to 40% of exploration and deposit appraisal spending.

Future Opportunities

Key Observations

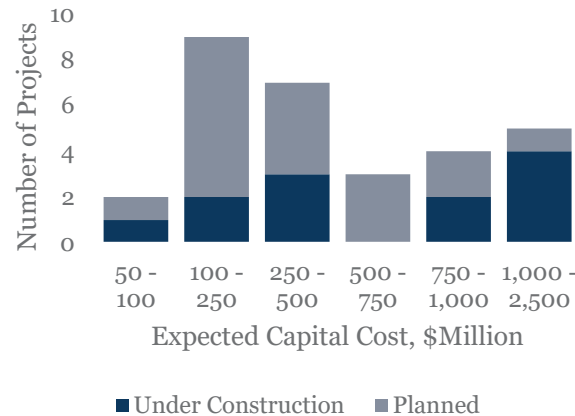
- ▶ Natural Resources Canada tracks major projects in the mining sector. To be included on the list, the expected capital cost of a mining project must be greater than \$50 million.
- ▶ The 2023-2033 major projects list includes 30 mining projects in Ontario. Twelve of the projects are under construction, while 18 are in the planning stage.
- ▶ The major projects list includes three projects under construction with an expected capital cost of more than \$1 billion: Victoria, Greenstone and Onaping Depth.
- ▶ Ontario tracks projects slightly differently and has a list of 32 Significant Mineral Projects.
- ▶ The most common target minerals for Significant Mineral Projects in Ontario are gold, copper, nickel and platinum group elements.
- ▶ Ontario's active exploration projects include projects that are part of the 'Ring of Fire', a mining development area located in the James Bay Lowlands of Northern Ontario that holds potential for significant mineral reserves.

Targets, Significant Metals Projects

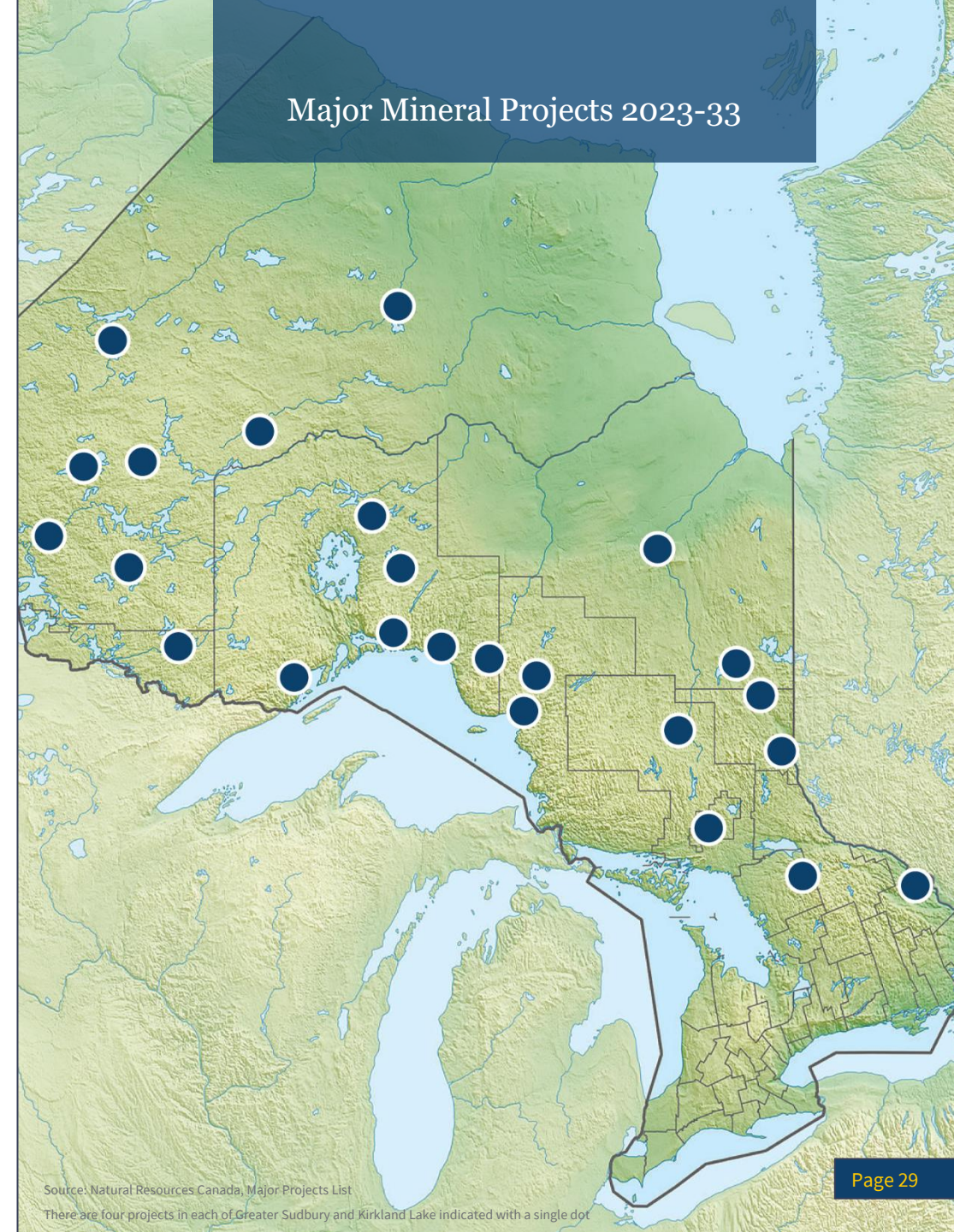


Source: Significant Mineral Projects and Operating Mines in Ontario Map
 "PGE" is Platinum Group Elements

Major Mineral Projects 2023-33, Expected Capital Cost



Source: Natural Resources Canada, Major Projects List



Source: Natural Resources Canada, Major Projects List

There are four projects in each of Greater Sudbury and Kirkland Lake indicated with a single dot

New Mine Openings

Between 2019 to 2024, four mines have come into commercial production in Northern Ontario:

- ▶ Newmont's Borden gold mine near Chapleau
- ▶ Alamos Gold's Magino gold mine near Dubreuilville
- ▶ IAMGOLD's Côté gold mine near Gogama
- ▶ Equinox Gold's Greenstone gold mine near Geraldton



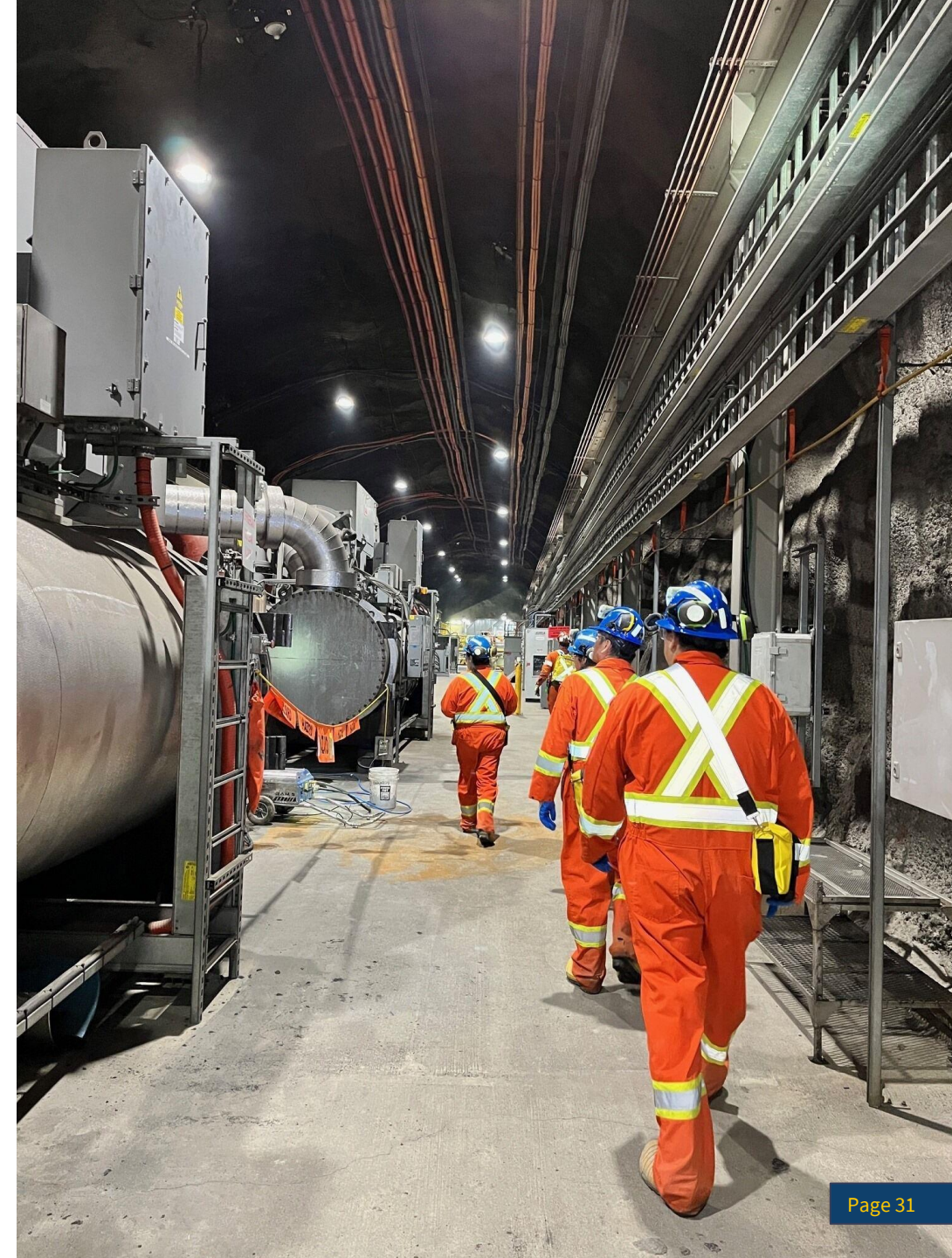
Photo: IAMGOLD Côté Mine

Construction Projects

New mine construction is underway at six projects in Ontario:

- ▶ Gowest Gold's \$27 million Bradshaw gold project near Timmins
- ▶ KGHM's \$1.0 billion Victoria nickel project in Sudbury
- ▶ Glencore's \$1.5 billion Onaping Depth nickel-copper project in Sudbury.
- ▶ Magna Mining's \$48 million Crean Hill project in Sudbury
- ▶ Vale's \$205 million Stobie Mine Open Pit project in Sudbury
- ▶ West Red Lake Gold's \$73 million Madsen project in Red Lake

Photo: Photo: Glencore Sudbury
Integrated Nickel Operations - Onaping
Depth Project



Expansion Projects

Four mine expansion projects are currently active in Ontario (as of January 2024):

- ▶ Agnico Eagle is advancing a \$88 million Detour Lake mine expansion project northeast of Cochrane.
- ▶ Alamos Gold is advancing a \$974 million expansion project at its Island Gold mine near Wawa.
- ▶ McEwen's Black Fox gold mine near Matheson is undergoing a \$452 million expansion.
- ▶ Newmont's Pamour mine near Timmins, received full fund approval for a \$500-million-dollar project to bring the historical open pit mine back into production.



Photo: Alamos Gold – Island Gold Expansion Project

The People of Mining

Photo: Glencore Sudbury Integrated Nickel Operations

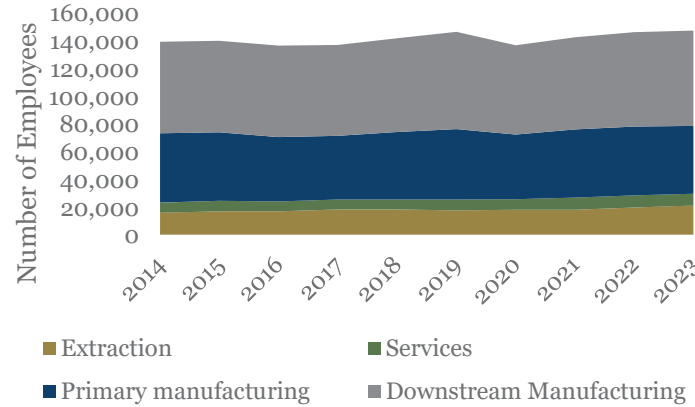


Workforce Characteristics

Key Observations

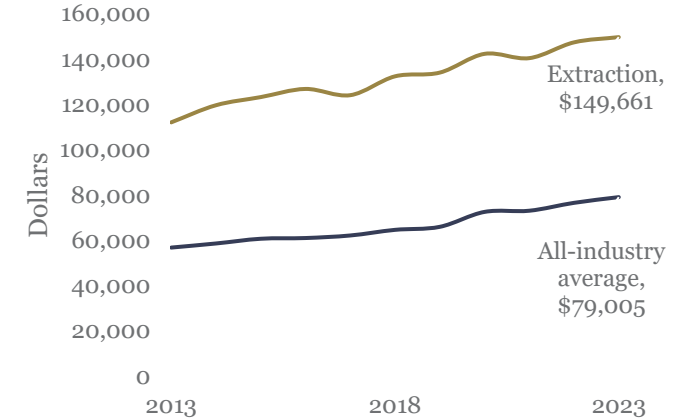
- ▶ In 2023, the mining industry employed almost 150,000 people in Ontario, a record high.
- ▶ Primary extraction (i.e., mining and quarrying) employed 21,758 people. Services employed 8,462, primary manufacturing employed 48,875 and downstream manufacturing employed 68,666.
- ▶ The average compensation in extraction is almost double the average for all industries, at \$149,661 per year. Services for mining, primary manufacturing and downstream manufacturing all have substantially higher wages than the average.
- ▶ Between 2013 and 2023, average earnings for mining and quarrying grew by 34%.
- ▶ On average, jobs in the mining services sector required the most work in 2023, at 2,345 hours. Hours worked per job in extraction were slightly behind, at 2,145 hours per year.
- ▶ About 25 per cent of direct mining jobs in Canada are in Ontario.

Mining Employment, Ontario



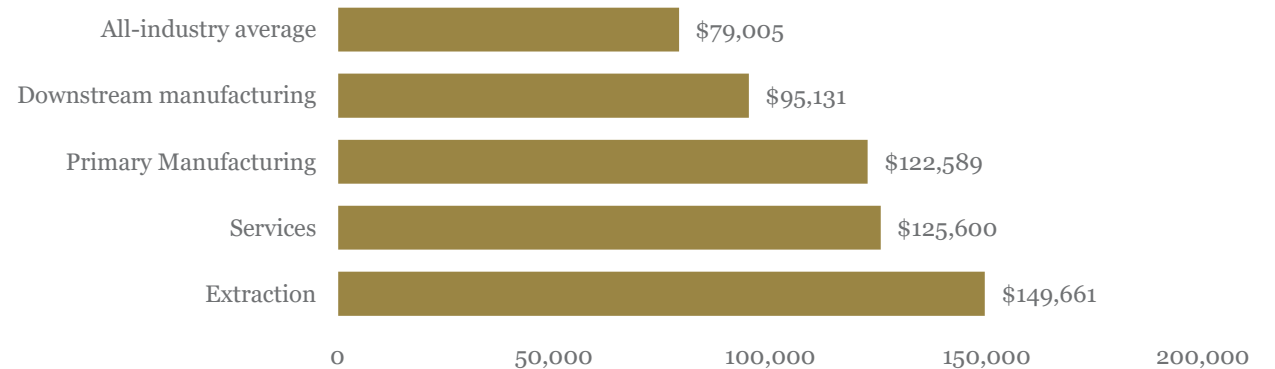
Source: Statistics Canada, Table 14-10-0202-01

Annual Earnings, 2013-2023



Source: Statistics Canada, Table 36-10-0489-01

Mining Sector Compensation, 2023



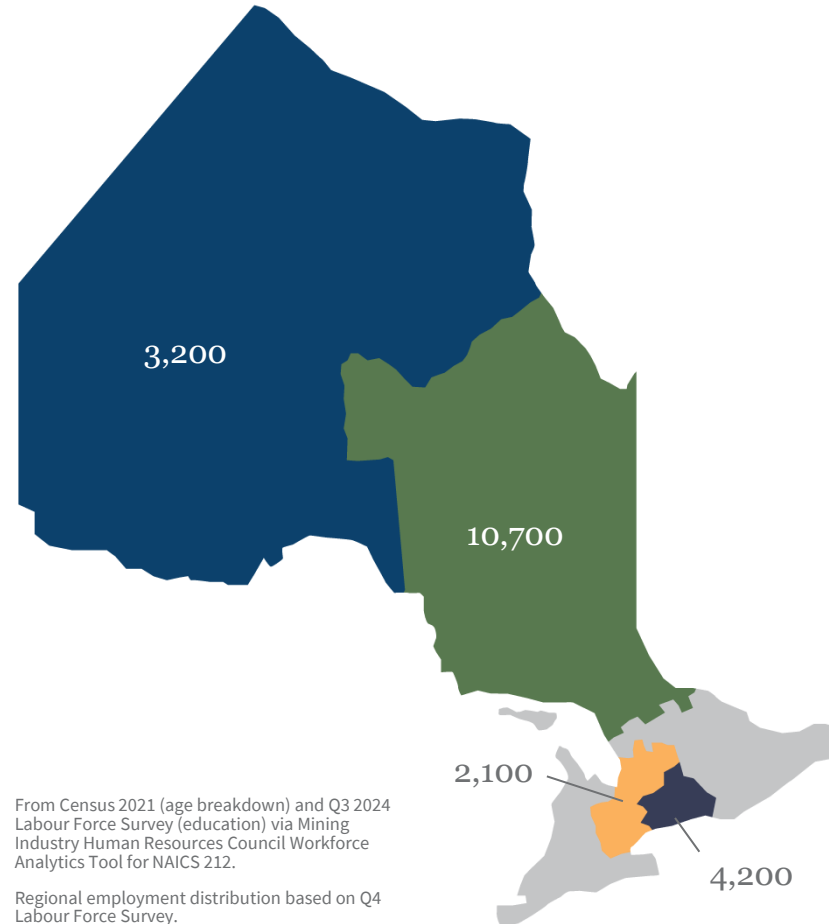
Source: Statistics Canada, Table 36-10-0489-01

Workforce Demographics

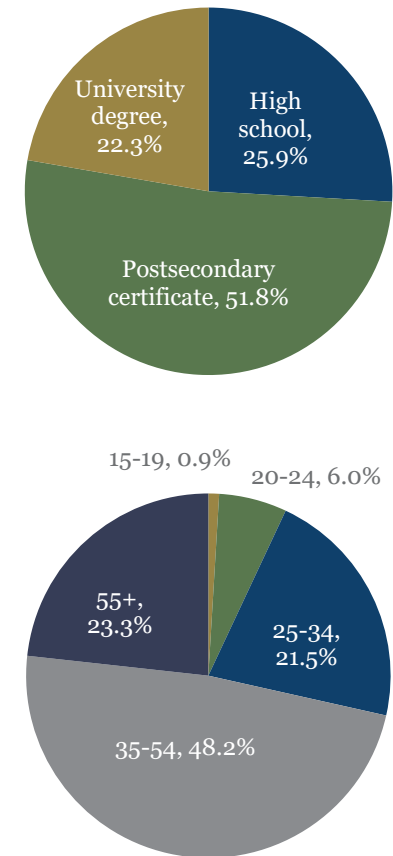
Key Observations

- ▶ For the mining and quarrying industry, there were 21,700 employees in Ontario in 2023.
- ▶ Approximately half of these employees work in Northeastern Ontario.
- ▶ About half of the mining and quarrying industry workforce is 35-54. Another 23% is over 55. Older workers are proportionally overrepresented in the mining sector, which increases recruitment challenges in a tight labour market.
- ▶ About a quarter of the mining industry labour force in Ontario has a high school degree, and a similar proportion has a university degree. More than half of the labour force has a post-secondary certificate.

Regional Employment Distribution, Extraction, 2024



Mining Industry Workforce Demographics

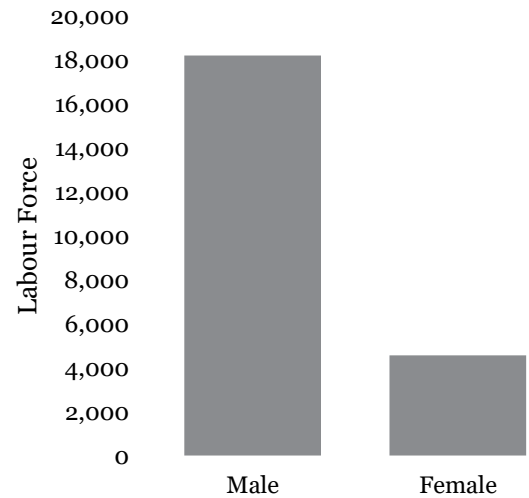


Diversity

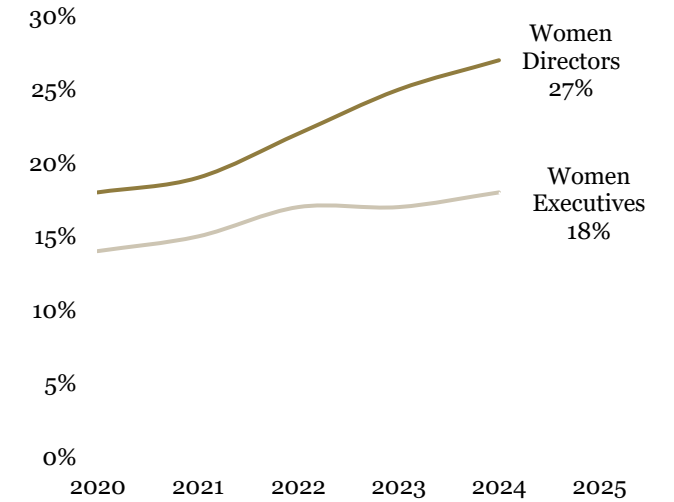
Key Observations

- ▶ At the end of 2024, the mining industry in Ontario was about 80% male and 20% female.
- ▶ The median wage for female workers was \$1,600 per week, compared with the overall industry median wage of \$1,800 per week.
- ▶ Listed firms on the TSX are required to report on women on boards and in executive positions. Osler, Hoskin & Harcourt LLP reviews and summarizes these disclosures every year to produce a report on diversity in Canadian business.
- ▶ Women directors as a per cent of total board members have increased since 2020, to 27%. This result is generally consistent with overall numbers in Canadian business, where 28.2% of total board seats are held by women.
- ▶ Female executives in mining increased to 18% in 2024, slightly below the all-industry average of 21%.
- ▶ The mining workforce was made up of 21% immigrant employees and 79% non-immigrants at the end of 2024.

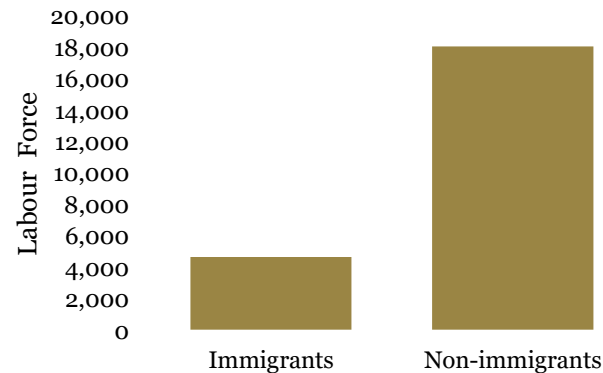
Mining Labour Force by Sex



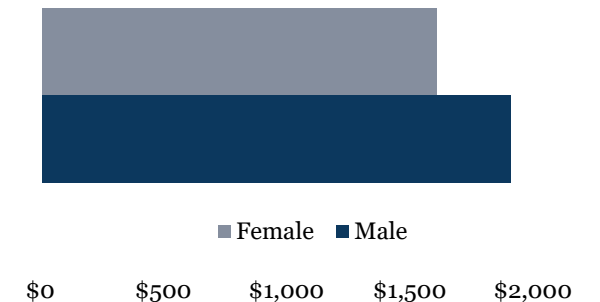
Women Executives and Directors in Mining



Immigrants in the Mining Labour Force



Weekly Compensation



Indigenous Involvement

Photo: IAMGOLD Côté Mine

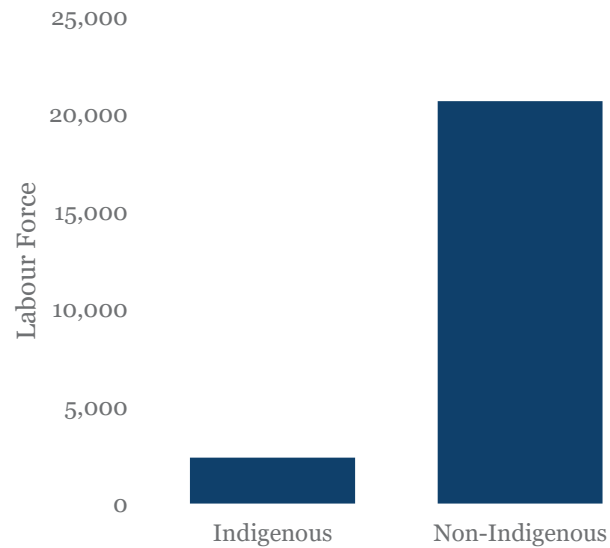


Indigenous Employment in Mining

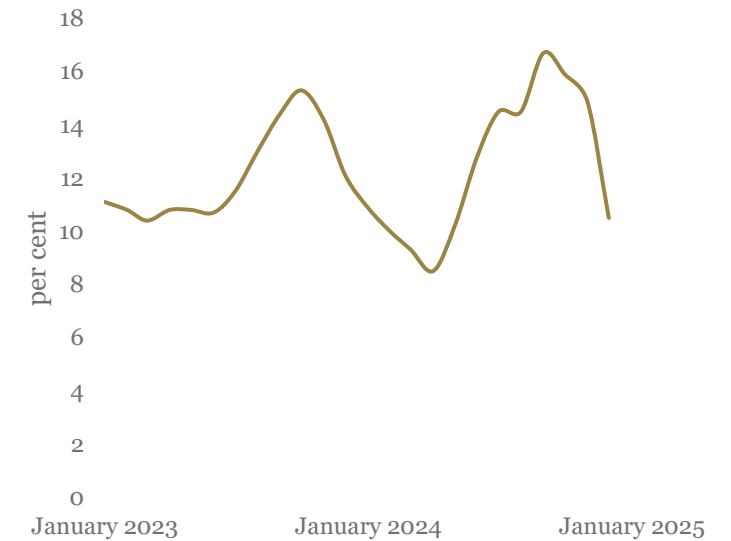
Key Observations

- ▶ At the end of 2024, the mining workforce in Ontario was about 10% Indigenous. The average over 2023 and 2024 was 12%.
- ▶ Over the same period, the proportion of Ontario's overall workforce that was Indigenous was less than 3%.
- ▶ The majority (almost 70%) of Indigenous employees work in the northeast area of the province.
- ▶ The northwest is the other major area of employment, with 21% of Indigenous employees working in the area.
- ▶ The median annual compensation for Indigenous workers in the mining sector is \$89,000 per year. This is substantially above the median compensation for Indigenous workers across all occupations, which was \$37,600 at the end of 2024.

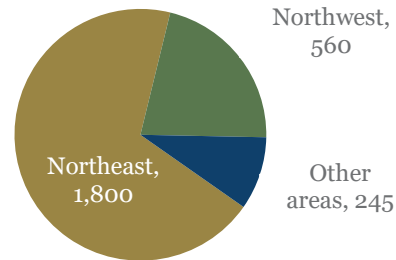
Indigenous Employment in Mining



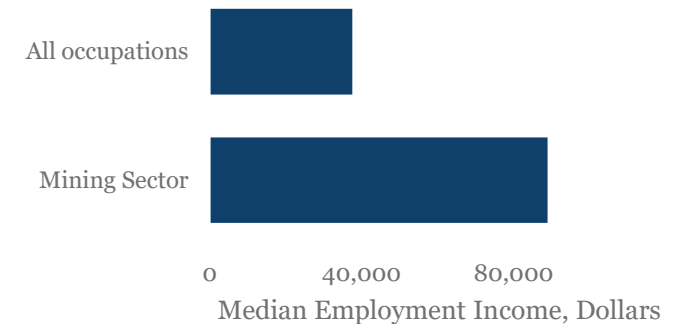
Indigenous Employment as percent of Total



Indigenous Employment by Location



Indigenous Compensation by Sector



From December 2024 Labour Force Survey via Mining Industry Human Resources Council Workforce Analytics Tool for NAICS 212.

Community Partnerships

Key Observations

- ▶ There are **142 active agreements** in place between Indigenous communities and mining companies across Ontario.¹ These agreements formalize mutually beneficial relationships between Indigenous communities and the province's mining industry.
- ▶ Over **40 exploration agreements** are currently active.
- ▶ In 2018, Ontario signed three resource revenue sharing agreements with 35 First Nations represented by Grand Council Treaty #3, Mushkegowuk Council and Wabun Tribal Council.
- ▶ These agreements share a portion of mining and forestry revenues. Participating communities use the funds for economic development, health, education, community development and cultural development.

Sources:

1. Natural Resources Canada, data from Lands and Minerals Sector - [Indigenous Mining Agreements](#) at the Atlas of Canada. Data were published 2019-06-10.
2. Government of Ontario, [Resource Revenue Sharing](#). Updated 2024-08-08.

Agreement Type

- Memorandum of Understanding
- Exploration Agreement
- Impact and Benefits Agreement
- Cooperation Agreement
- Engagement Agreement
- Letter of Intent
- Negotiation Protocol
- Participation Agreement
- Socio-Economic Agreement
- Other



Contributions to Local Communities



Photo: IAMGOLD Côté Mine

Oshki Lake Celebration

Members of the IAMGOLD executive and Côté Gold team alongside Indigenous partners from Mattagami and Flying Post First Nations and representatives from Sumitomo Metal Mining Co. Ltd. gathered at the Côté Gold mine site for a water ceremony marking the creation and official naming of Oshki Lake. This new water body was built to offset fish habitat lost during the construction of the Côté Gold mine.¹

Outland Youth Employment Program

Wyloo has been a longstanding and proud partner of the Outland Youth Employment Program (OYEP), a national network of land-based education, training and work opportunities for high school aged Indigenous youth. Through OYEP, Indigenous youth can participate in a six-week work experience designed to provide hands on training and education in environments that simulate various work settings.²



Photo: Wyloo

1. [Environment: Celebrating the Creation of Oshki Lake](#), July 8 2024.
2. Outland Youth Employment Program, [2023 National Report](#).

Safety

Photo: Glencore Sudbury Integrated Nickel Operations



Lost Time Injury Rate

Key Observations

- ▶ Safety is a core value of Ontario's miners. In partnership with their employees and suppliers, mining companies work to create a positive safety culture.
- ▶ In general, the lost time injury rate for mining is below the average rate for all industries. Since 2020, the lost time injury rate for mining, quarrying and oil and gas extraction has averaged 17% below the all-industry rate.
- ▶ For mining, like the all-industry average, lost time claims rose sharply in the pandemic years, before decreasing in 2023. COVID-19 was the leading injury category in both 2021 and 2022.
- ▶ The ultimate goal for all Ontario mining companies is to achieve a zero-incident work environment. To that end, mining companies devote themselves to promoting an ingrained workplace safety culture by training employees, engaging in risk management, measuring performance, rewarding achievement, sharing information and adopting best practices.



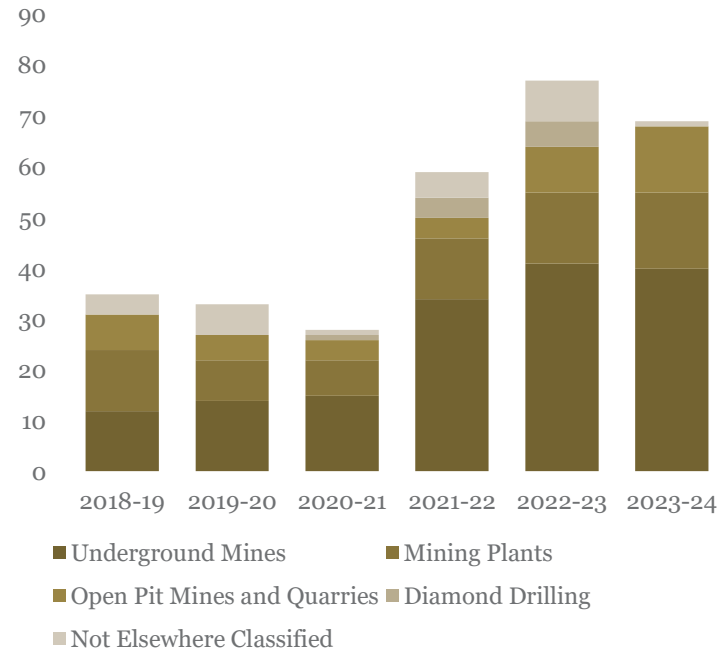
Source: Workers Safety Insurance Board, using data for lost time injury rate for all industries and for mining, quarrying and oil and gas extraction. Lost Time Injury Rate is the number of allowed lost-time injury and illness claims per 100 Full-Time Equivalents (FTE) for the year specified. The calculation uses derived FTE, which is based on a business' insurable earnings and average hourly wages defined by the WSIB.

Safety by Area

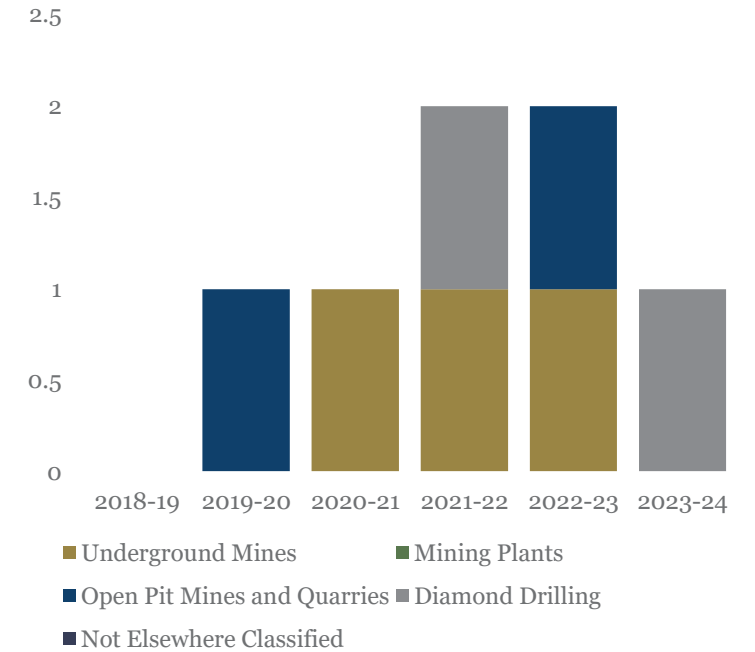
Key Observations

- ▶ The Ministry of Labour, Immigration, Training and Skills Development tracks critical injuries, traumatic fatalities and other safety statistics in the mining sector by fiscal year.
- ▶ Lost time injuries increased between 2020-21 and 2022-23, but decreased again in 2023-24.
- ▶ Underground mines were the largest source of lost-time injuries, followed by mining plants.
- ▶ Traumatic workplace fatalities in the mining sector are low. As tracked by the Ministry of Labour, Immigration and Skills Development, there were one or two fatalities in each year between 2019-20 and 2023-24 compared to the all-industry average in Ontario of 67 to 95 traumatic workplace fatalities in each year between 2020 and 2024.

Lost Time Injuries by Area



Workplace Fatalities by Area



Source: [Mining Program Sector Trends](#), Ministry of Labour, Immigration, Training and Skills Development

Ontario's Mining Operations Leading the Way in Health and Safety

Ontario's mining industry taking the lead in health and safety:

- ▶ First Gold Mining's Employee Health & Wellness Strategy (Strategy) takes a progressive approach to account for the broader geographic, economic, social and community factors that underpin an individual's ability to bring their best self to work and home afterwards. The Strategy helps promote overall safety by addressing stress, cultural awareness, diversity, and mental health challenges that can contribute to accidents, poor decision-making, and decreased productivity. Northern-focused health and wellness supports are crucial to improving employment participation, creating a mental health-conscious workplace, and enabling the Project, local people, and communities to thrive. The approach necessitates more than standard corporate occupational health and wellness policies and programs - it looks at employee health and well-being through a proactive lens by embracing education, prevention, and early intervention measures.
- ▶ Glencore Sudbury Integrated Nickel Operations' Fraser Mine was awarded the 2023 John T. Ryan National Trophy for Metal Mines for the best safety performance in Canada from the Canadian Institute of Mining, Metallurgy and Petroleum (CIM). This marks the second year in a row that Glencore Sudbury INO was awarded this prestigious industry award as its Nickel Rim South Mine took home the national trophy in 2022.¹

- ▶ Agnico Eagle's Macassa mine has come out on top in the 2024 provincial Ontario Mine Rescue competition. Ontario Mine Rescue competitions, first began in 1950 requiring participants to undergo a series of tests that are split into live scenarios and theory-based tests. Skills that are tested include how to use special equipment, firefighting, first aid and more.²
- ▶ Redpath Safety Leader Program celebrates and rewards workers who go above and beyond in demonstrating proactive safety behaviours. These leaders reinforce Redpath's commitment to "Safety – First, Last and Always". Their efforts can have a direct impact on sending miners home healthy and safe, every shift. In addition to being celebrated in front of their peers and presented with certificates, Redpath recognized 13 workers in the company's Ontario operations and gave out \$4,400 in swag in 2024. Redpath's focus on recognizing staff for safety accomplishments not only motivates more employees to hold safety as a priority, it also engages them in advocating for their co-workers' well-being.



Photo: Glencore Sudbury Integrated Nickel Operations

A man and a woman are sitting at a desk in an office, looking at a computer monitor. The man is holding a pen and pointing at the screen. The woman is typing on a keyboard. The monitor displays a technical drawing or map. The desk is cluttered with cables and a keyboard. The background shows office cubicles.

Education & Recruitment

Photo: Glencore Sudbury Integrated Nickel Operations

Recruitment and Education

Key Observations

- ▶ The proportion of mining workers over 55 has been increasing in recent years. In 2012, only 15% of the workforce in mining, quarrying and oil and gas extraction in Ontario was 55 or older. By 2024, this value reached 21%.¹
- ▶ As these workers approach retirement, an influx of new workers are needed. The Mining Industry Human Resources Council's (MiHR) Canadian Mining Outlook 2024 estimates that the industry will need to hire a minimum of 135,000 people across Canada over the next decade. These new hires are required to replace retirees and fill new positions to meet baseline production targets.
- ▶ Enrolment in mining-related fields is declining: after a high point in 2014-15, technicians and engineering-related students were down by almost a quarter in 2022-23.²
- ▶ Mining, geological, and materials engineers only made up 2% of Ontario's engineering undergraduate enrolment in 2022.

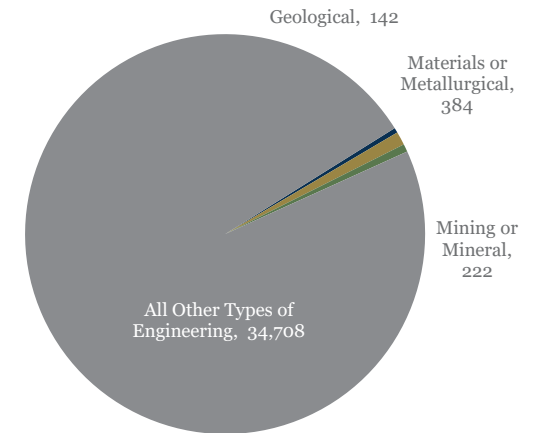
Sources:

1. Statistics Canada Table 14-10-0023-01 for 55+ employment. Number varies slightly from the most recent labour force survey value (23%) presented elsewhere in the report because of the different measurement period.
2. Canadian Engineers for Tomorrow: Trends in Engineering Enrolment and Degrees Awarded 2022.
3. Statistics Canada. Table 37-10-0277-01 for education enrolment over time.

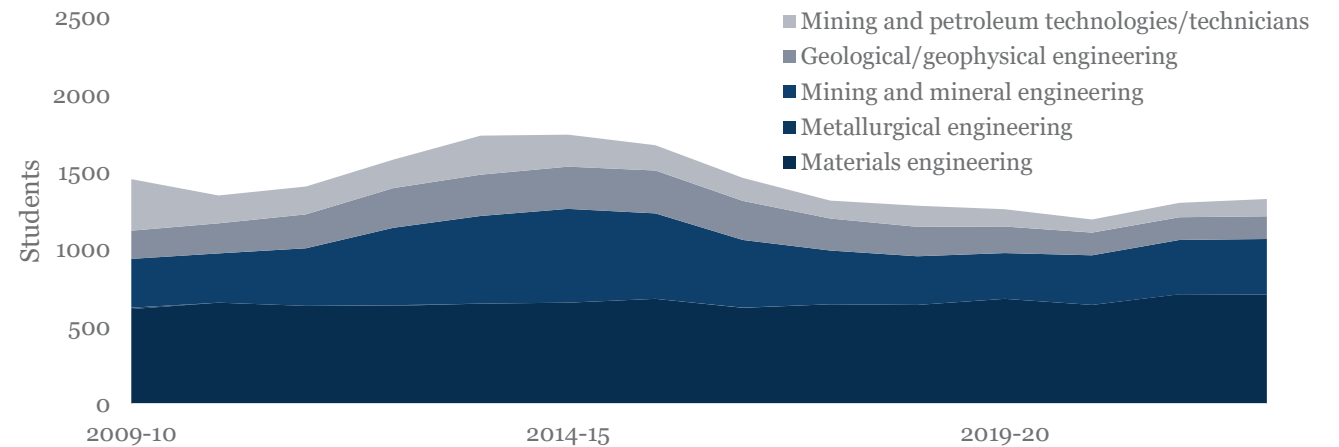
Workers 55+ and the Labour Force¹



Engineering Undergrad Enrolment, 2022²



Enrolment in Selected Mining-Related Fields by Year³



Recruiting New Miners

- ▶ In 2024, Agnico Eagle Mines received \$10 million from the Province of Ontario's Skills Development Fund Training Stream to provide a comprehensive skills development program to support the availability of a qualified workforce in the mining industry. Agnico Eagle will use this funding to continue leading workforce development initiatives in Northern Ontario with the goal of hiring 100% of their workforce from the regions in which they operate.¹
- ▶ To address the industry's skilled labour shortage, OMA's This is Mine Life (TIML) initiative, implemented in partnership with the Ontario Labour Market Partnerships program, is reframing the narrative about modern mining. Since launching in June 2023, it has reached nearly 15 million people and generated interest in mining careers among 1.3 million youths aged 15 to 28, particularly in Northern Ontario. In collaboration with industry partners and career ambassadors, TIML engages educators and influencers, showcasing the sector's technological advancements and role in achieving a low carbon future. It has connected with 26,976 youths at in-person events, employed digital platforms and produced an award-winning podcast to spark curiosity about Ontario mining. TIML aims to broaden the talent pipeline by reaching historically underrepresented groups, including immigrants and Indigenous youth, vital to the future workforce of Ontario's mining sector.²

Sources:

1. [Agnico Eagle Awarded \\$10 Million from the Ontario Skills Development Fund.](#) November 12, 2024.
2. [This is Mine Life.](#)



Photo: This is Mine Life

An aerial photograph of a rugged, rocky landscape. The foreground is dominated by a dense forest of evergreen trees. The middle ground shows a rocky, uneven terrain with patches of low-lying vegetation and small trees. The background features a vast, open landscape with more rocky terrain and sparse vegetation under a clear sky. A semi-transparent dark blue banner is overlaid on the left side of the image, containing the title and photo credit.

Environment, Energy and Innovation

Photo: Frontier Lithium

Minerals and the Green Economy

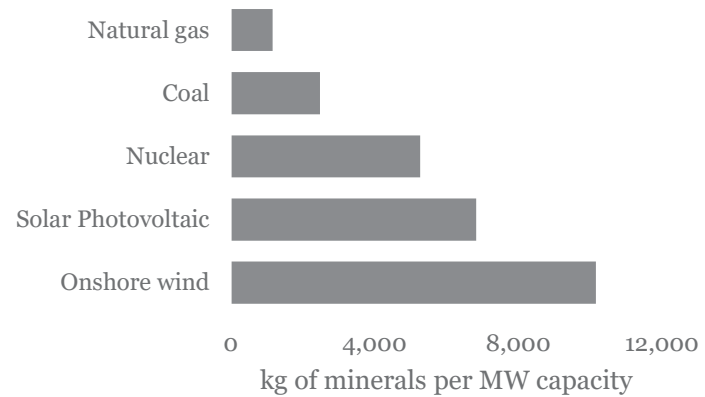
Key Observations

- ▶ Minerals and metals will help the world transition to a low-carbon future. Low-carbon technology often requires more minerals than existing technology. For example, electric vehicles require six times more minerals than internal combustion vehicles.
- ▶ Battery and plug-in hybrids are becoming more prevalent in Ontario. In the third quarter of 2024, new registrations were almost 9% of all vehicles, up from less than 1% in the first quarter of 2017.
- ▶ Low-carbon electricity also requires substantial mineral inputs. Onshore wind plants require nine times more minerals than gas plants of the same capacity, and solar plants require six times more minerals.
- ▶ Both wind and solar have become increasingly important to Ontario's electricity grid. In the decade to 2023, wind power increased from 7.7% of installed capacity to 13.1%. Solar increased from 0.7% to 5.3% of generation capacity.

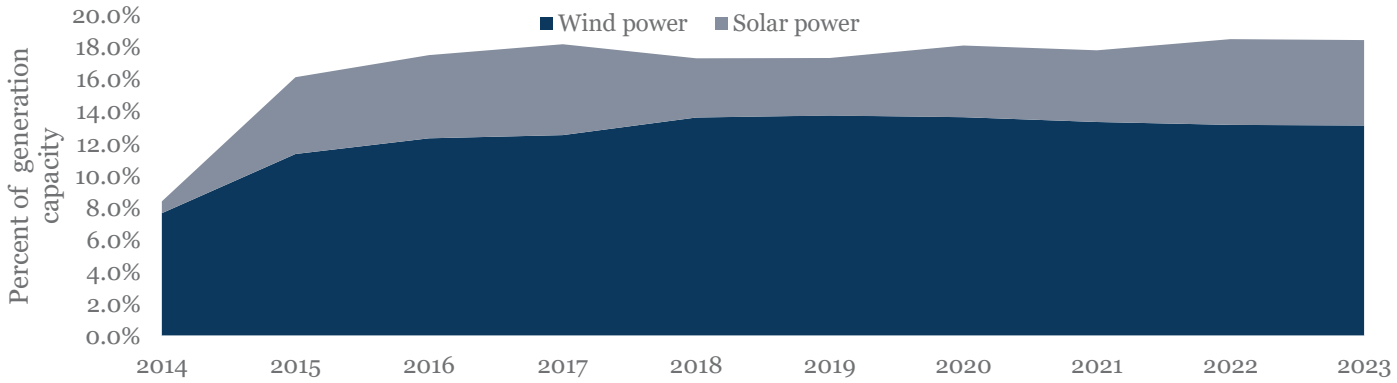
Battery + Plug-in Hybrids as percent of All New Vehicle Registrations



Minerals Required per Unit of Generation Capacity



Generation Capacity, Wind and Solar



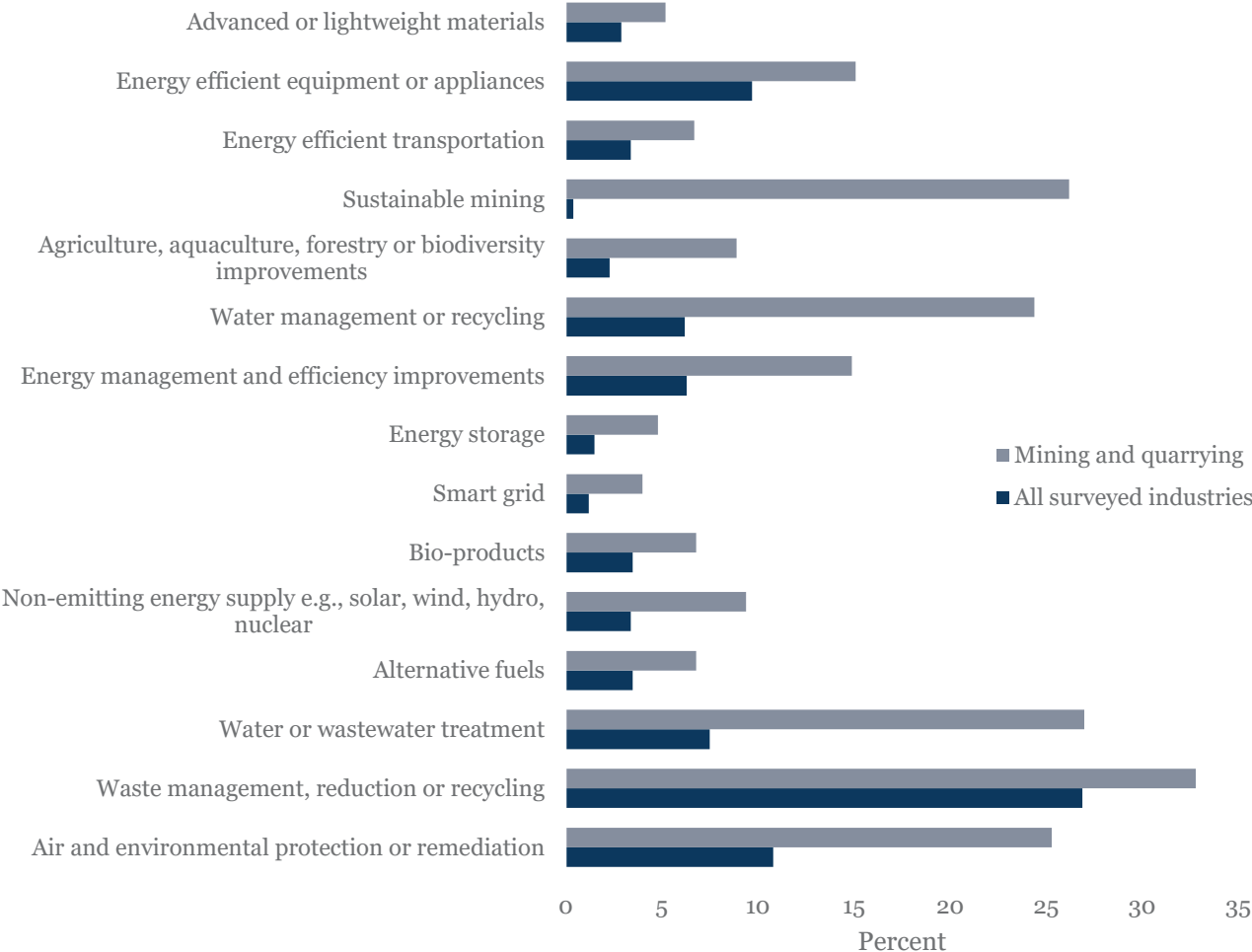
Sources: Statistics Canada. Tables 20-10-0024-01 (vehicle registrations) and 25-10-0022-01 (generation capacity). International Energy Agency, [The Role of Critical Minerals in Clean Energy Transitions](#).

Clean Technologies

Key Observations

- ▶ The mining industry in Ontario has adopted advanced clean technologies at higher rates than industries such as utilities and manufacturing.
- ▶ The most recent survey of the adoption of clean technologies indicates that the mining industry is well ahead of the all-industry average for all clean technologies surveyed.
- ▶ Some examples of the mining industry's leadership in clean technology include:
 - ▶ Non-emitting energy supply – adopted by the mining industry at almost three times the rate of the industry average.
 - ▶ Water management/recycling – adopted by the mining industry at almost four times the rate of the industry average.
 - ▶ Smart grids, adopted at more than three times the average.
 - ▶ Air and environmental protection/remediation, adopted at more than twice the average rate.

Adoption of Clean Technologies, 2022



Source: Statistics Canada. Table 27-10-0362-01 Adoption of clean technologies, by industry and enterprise size

Innovation

IAMGOLD's Côté Gold mine is the first autonomous greenfield operation in North America. There are currently 21 autonomous trucks in the fleet, hauling close to 130,000 tonnes per day. The trucks use a combination of high precision GPS, radar and lasers, with light detection and ranging (LIDAR) technology to orient themselves. The autonomous fleet runs around the clock, in any condition, increasing productivity and keeping workers safe. It is controlled from the integrated operations centre (IOC) at site. IOC staff have access to data, metrics, and advanced analytics, so they can make informed, coordinated, and expedient decisions. The autonomous haul trucks maximize safety and control the operating conditions of automated equipment. Machines work in designated Autonomous Operating Zones (AOZ) where only a very limited number of qualified and necessary personnel can access the zones.¹

1. IAMGOLD Cote Gold, Mining and Technology.



Photo: IAMGOLD Côté Mine

Energy Efficiency

- ▶ Alamos Gold's Island Gold mine has been focusing on maximizing the energy efficiency of ventilation fans underground. In 2023 a ventilation-on-demand system was implemented, which allows an operator to control and monitor over 100 fans in the mine. The operator can set timers for automatic shut off, as well as start and stop fans manually on an as-needed basis. This resulted in savings of approximately 3,237,703 kWh in the first half of 2024 (compared to H1 2023). In addition, fan sizes were assessed to identify any units that were larger or more energy intensive than required. Twelve such fans were identified. By the end of 2024, seven of those twelve had been successfully retrofitted, resulting in savings of approximately 1,859,779 kWh annually.¹
- ▶ Glencore's Sudbury Integrated Nickel Operations' Onaping Depth project is developing one of the world's first mines wholly operated battery electric-powered vehicles (EVs). Through using EVs, Onaping Depth is expected to reduce its energy usage by 44% for ventilation systems and by 30% for cooling equipment, compared to an equivalent diesel-fuelled operation.²

1. Alamos Gold ESG Report 2022.

2. Onaping Depth: Collaborating with the EV industry to prepare for mining at depth. May 14, 2019.



Photo: Alamos Island Gold Mine

Environment

Environmental stewardship is pivotal for the Ontario mining sector

- ▶ Lake Shore Gold commissioned their paste plant at the Bell Creek Mine on October 24, 2024, just two years after initiating the project. The paste plant will help with underground mining processes by helping backfill stopes faster, allowing mining of additional ounces and by helping to provide ground stability. The implementation of the paste plant helps to reduce environmental impacts on the surface by utilizing tailings.
- ▶ First Gold Mining is supporting the federal and provincial target of net-zero through the development and implementation of a Net-Zero Strategy. The Net-Zero Strategy details their plan for a net-zero project and to embed a climate positive approach to all aspects of their Springpole project.¹

1. First Mining Gold. [Building a Strong Foundation: 2023 ESG Report](#).

2. Greater Sudbury. [Regreening Program 2023](#).

3. Science North. [Science North celebrates the premiere of their new film Planting Hope: A Regreening Story](#). November 29, 2024.

Ontario mining companies participate in regreening efforts

- ▶ Vale Base Metals and Glencore Sudbury Integrated Nickel Operations have continued to work with a multi-disciplinary group from a variety of sectors to advance Sudbury's regreening program. As of 2024, more than 10.3 million trees were planted, 3,504 hectares were limed and fertilized, and about 2.28 hectares of forest floor plots were transplanted.²
- ▶ Vale Base Metals' corporate partnership with Science North / Dynamic Earth in support of the Dynamic Earth Expansion Project includes the *Planting Hope: Regreening Story*, a documentary film that tells the inspiring story of transformation and the resilience of the Sudbury community and its mining industry, who came together to repair the legacy environmental effects of mining on the landscape.²



Photo: Vale Base Metals: Greenhouse



Photo: Vale Base Metals: Greenhouse



Photo: Glencore Sudbury Integrated Nickel Operations