OVIN
AUTONOMOUS • CONNECTED • ELECTRIC

Ontario

A Spotlight on Skills, Talent & Workforce Development: Critical Minerals for Electrification

Ontario Centre of Innovation – Ontario Vehicle Innovation Network (OVIN)
August 2023

OCI
Where Next Happens

Table of Contents

Acronyms and Glossary of Terms

Acronyms	
CAE	Computer-aided engineering
CIP	Classification of Instructional Programs
DCS	Distributed control system
EDI	Equity, diversity and inclusion
EV	Electric vehicle
GDP	Gross domestic product
HMI	Human machine interface
LIDAR	Light detection and ranging
MEDJCT	Ontario Ministry of Economic Development, Job Creation and Trade
MLITSD	Ministry of Labour, Immigration, Training and Skills Development
MTO	Ministry of Transportation
NAICS	North American Industry Classification System
NOC	National Occupational Classification
OCI	Ontario Centre of Innovation
OVIN	Ontario Vehicle Innovation Network
SCADA	Supervisory control and data acquisition
TCL	Tool command language

Glossary of Terms	
Advanced manufacturing	Use of technology and innovation to improve efficiency in manufacturing.
Apache Maven	Build automation tool for managing project builds and dependencies.
Autodesk Combustion	Software for compositing and visual effects in media production.
Automotive manufacturing	Production of vehicles using various techniques and technologies.
Automotive technologies	Technologies used in designing and producing vehicles.
Critical minerals	Subset of the raw materials needed to produce advanced products and specialized technologies.
Mining and mineral processing	Extraction and processing of minerals from the earth.
Mobility manufacturing	Production of mobility devices and modes of transport.
Skilled labour	Workers with specialized skills in the labour market.
Smart mobility	Integration of transportation technology to improve efficiency and safety.

Introduction

The Province of Ontario is rich in a variety of critical minerals, including copper, cobalt, and nickel,[1] which play a key role in the production and development of advanced technologies, such as electric vehicles (EVs). As of 2022, Ontario has **37 active mining operations**, with **10** of them **producing critical minerals.**[2] The **critical mineral industry** generates over **$3.5 billion in annual mineral production** for the province,[3] showcasing its importance and potential for Ontario's economy.

In March 2022, the Government of Ontario released **Ontario's Critical Minerals Strategy 2022-2027**, with the ultimate goal of **positioning the province as a global supplier of responsibly sourced critical minerals.**[4] This strategy complements other government initiatives, such as Driving Prosperity: The Future of Ontario's Automotive Sector, in the province's goals of **expanding its advanced manufacturing capabilities,**[5] particularly those related to the EV supply chain.

The strategy lays out six pillars for the industry to focus on during this five-year roadmap, with critical goals including the enhancement of critical mineral exploration, development of local supply chains, regulatory framework improvements, investments in research and development, and equitable economic strategies for Indigenous partners in the sector.

The sixth pillar of the Critical Minerals Strategy involves the **growth of the labour supply and the development of a skilled labour force for the sector**. As advanced technologies evolve and the demand for critical minerals increases, the need for high-skilled labour in the sector will also rise. Employers in the mining sector will be seeking workers who are able to operate sophisticated machinery and are knowledgeable of new technologies in the field.

Emerging skills in the critical minerals sector, particularly those which are crucial for the vehicle electrification value chain, include knowledge in geology, mineral exploration techniques, mining and process engineering, and data analytics.[6] Additionally, skills related to regulatory compliance and sustainability and environmental management are expected to be in **high demand**.

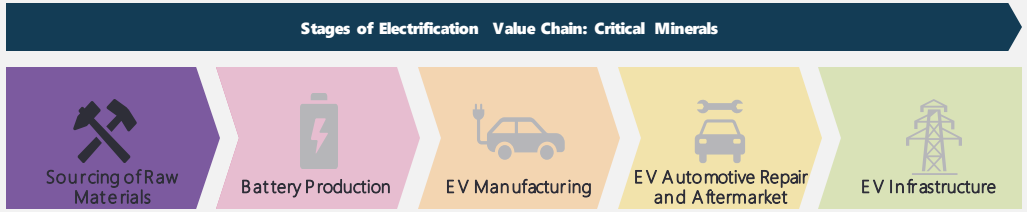
Along with technical skills, the sector will likely require **non-technical skills and abilities**, including communication and negotiation skills, project management skills, leadership, adaptability, and problem-solving.

Executive Summary

This spotlight highlights the following:

Ontario's Critical Minerals

Critical minerals are crucial to the first stage of the automotive Electrification value chain: sourcing and processing of raw materials. Below is an illustration of the sourcing of raw materials in the electrification value chain:



This section provides an overview of Ontario's resource endowment in critical minerals, and features the impact of recent technological developments on labour force requirements and skills development needs in the short- and long-term.

Labour Market and Emerging Skills

This section highlights the key occupations with the largest shares of employment in the mining sector, and associated skills that are required. It also presents a provincial labor market outlook for the next 10 years, identifying occupational gaps and emerging skills.

- Besides mining trades, top occupational employment shares include technical occupations such as mineral technologists, mineral engineers, etc.
- Current skill requirements include various technologies reflecting greater uptake of automation processes.
- High occupational gap is expected for assembly workers and manufacturing labourers in the future.

Talent and Workforce Development

This section highlights the workforce education profile indicating a strong focus on qualifications in mechanic and repair technologies and engineering. This is complemented by an overview of Ontario-based training and development programs tailored to the emerging skills and upskilling requirements essential to the mining sector.

Equity, Diversity and Inclusion

This section explores current trends in the representation of minority groups in mining sector employment in Ontario. It further examines national and global diversity and inclusion initiatives in the sector, highlighting priorities to promote employment access for underrepresented groups.

This spotlight serves as an introductory informational booklet and is part of a series covering various segments of the automotive and mobility sector. For more information on the highlighted knowledge, tools, skills, and abilities, please refer to the cited references and other relevant sources, including other OVIN publications.

Ontario's Critical Minerals at a Glance

Ontario is uniquely positioned to leverage its resource endowment to become a leader in critical minerals production.

33
minerals used in advanced manufacturing technologies are outlined in the Ontario Critical Minerals Strategy[7]

10 Ontario mines are currently producing critical minerals[8]

- Copper
- Cobalt
- Indium
- Selenium
- Platinum-group Elements
- Tellurium

Critical minerals are key inputs to Ontario's automotive and mobility industries:[9]

The automotive manufacturing sector* accounts for **2%** of Ontario's GDP

The broader mobility sector manufacturing industries* account for **2.3%** of Ontario's GDP as of 2021

The availability of skilled labour in the metal and ore mining workforce supports Ontario's critical minerals sector.

As of 2021, 17,540 workers are employed in Ontario's metal ore mining industry[10]

Top in-demand occupations

- Underground miners, oil and gas drillers and related occupations
- Machinery and transportation equipment mechanics
- Operators, drillers and blasters
- Mine service workers and operators in oil and gas drilling

Top skills required in Mining and Mineral Processing

- Distributed control system (DCS)
- Supervisory control and data acquisition systems
- Power tools and welding equipment
- Teamwork

EDI Snapshot[11]

Women representation
14.8%

Indigenous representation
12.4%

Visible Minority representation
7.1%

Looking ahead, Ontario mining labour force requirements point to greater digitalization and technical skills.

Reskilling
may help workers adapt to increased digitalization

Expected in-demand occupations

- Electronics assemblers, fabricators, inspectors and testers
- Labourers in processing, manufacturing and utilities

Expected Skill Gaps

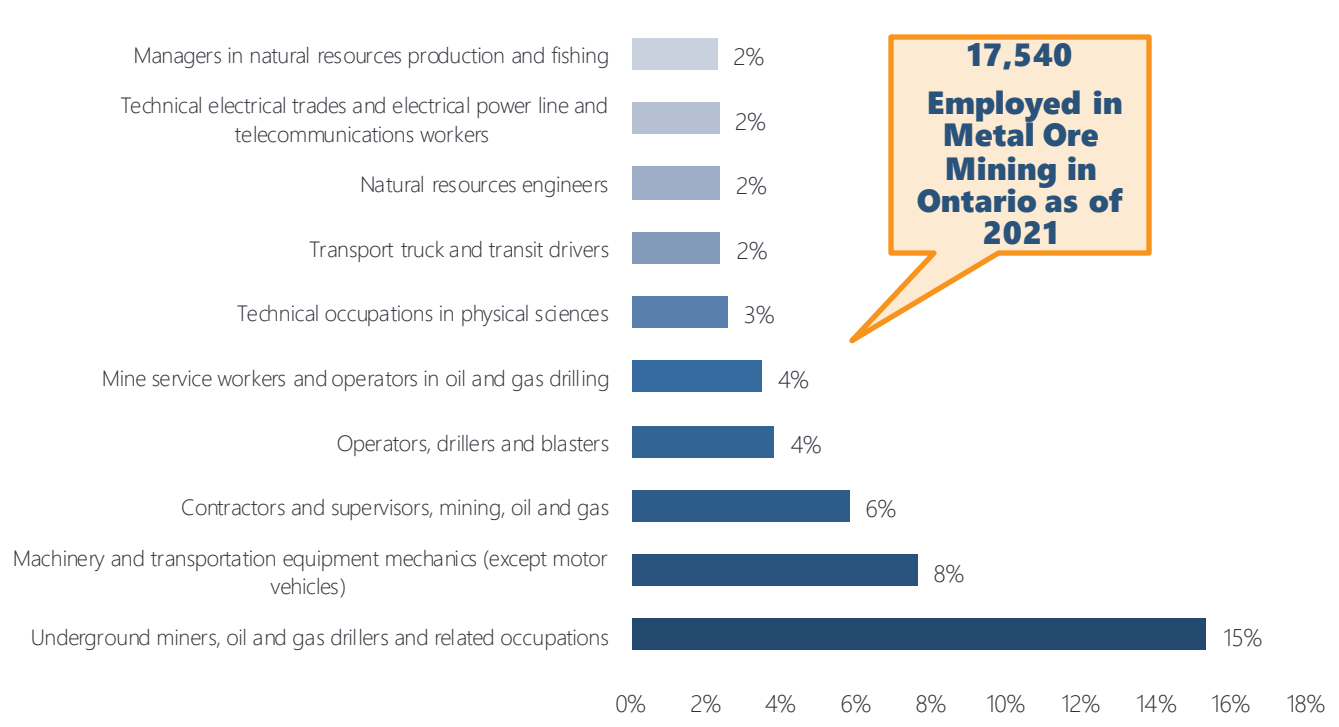
- Human machine interface
- Simulation software
- Computer aided engineering
- Mapping software

Note: *The automotive manufacturing sector is defined as NAICS 3326, 3335, 3344, 3353, 3359, 3361, 3362, and 3363. The broader mobility sector additionally considers NAICS 3336, 3364, 3365, 3366, and 3369.

Current Labour Market Insights

Top 10 Occupations in Metal Ore Mining[12]

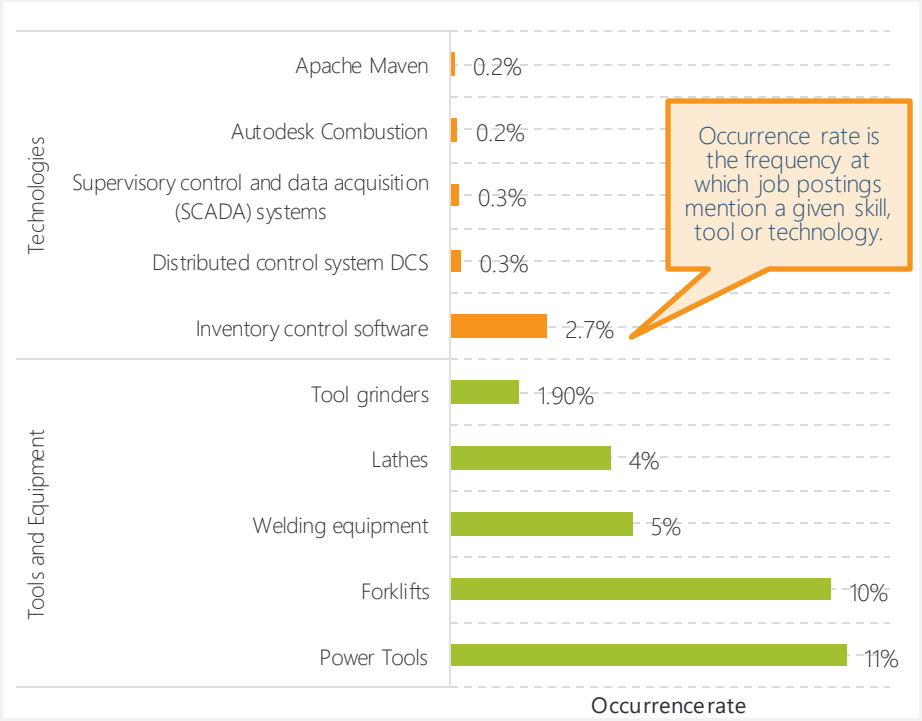
- The figure below presents the top 10 occupations based on employment in the metal ore mining industry, which are relevant to automotive Electrification.
- The top 10 occupations in the metal ore mining industry include technical occupations, such as:
  - Technical occupations in physical sciences (e.g., mineral technologists and technicians conducting mineral testing, mining feasibility assessments, etc.)
  - Natural resource engineers (e.g., mine design/development engineers, mineral engineers involved in planning and implementation processes for mining operations).



Note: The occupations in this chart are the top ten occupations with the highest employment as a share of total employment in metal ore mining (NAICS 2122).

Top Skill Requirements[13]

- Job postings (2018-2022) show that technical skills presented in the chart below are high in demand in the labour market. Qualified workers are also expected to have a strong command on general skills which are effective competencies and transferable across roles.
- Notably, various technologies reflecting greater uptake of automation processes are often requested by employers, including:
  - Apache Maven (build automation tool)
  - Supervisory control and data acquisition software (SCADA) systems (software configured to monitor industry control software)



Skills Outlook and Expected Gaps in Ontario

Labour Market Gap Outlook[14]

- The labour market outlook for 2023-32 time period is developed based on projected growth in:
  - **Demand:** sector expansion driven by economic growth, replacement demand arising from retirements in the sector, and workers transitioning to other sectors; and
  - **Supply:** new workforce entrants, including new graduates and trainees, immigrants, and workers from related sectors.

Expected Labour Market Gaps by Occupation

Expected labour market gaps are determined based on the difference in future labour demand and supply.

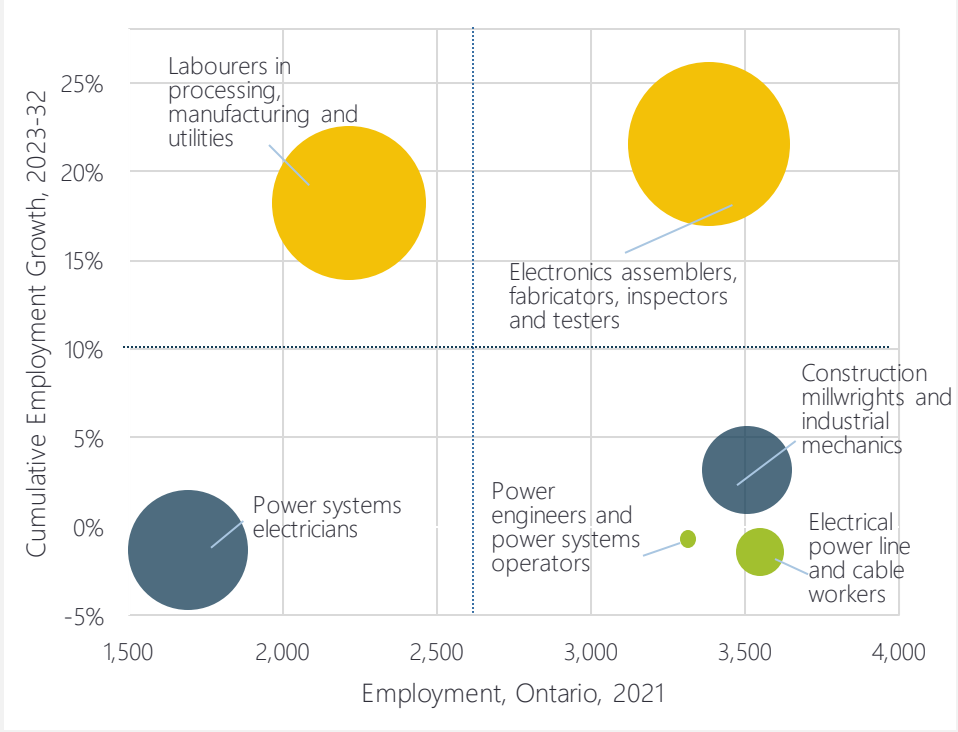
High

Moderate

High and moderate labour force gaps indicate that projected total demand for workers exceeds availability of workers in the labour market, suggesting potential challenges in finding qualified workers. **High gaps** are more acute and prominent for electronics assemblers, fabricators, and labourers, and given high level of employment and expected growth, this is a high priority for talent attraction.

Low

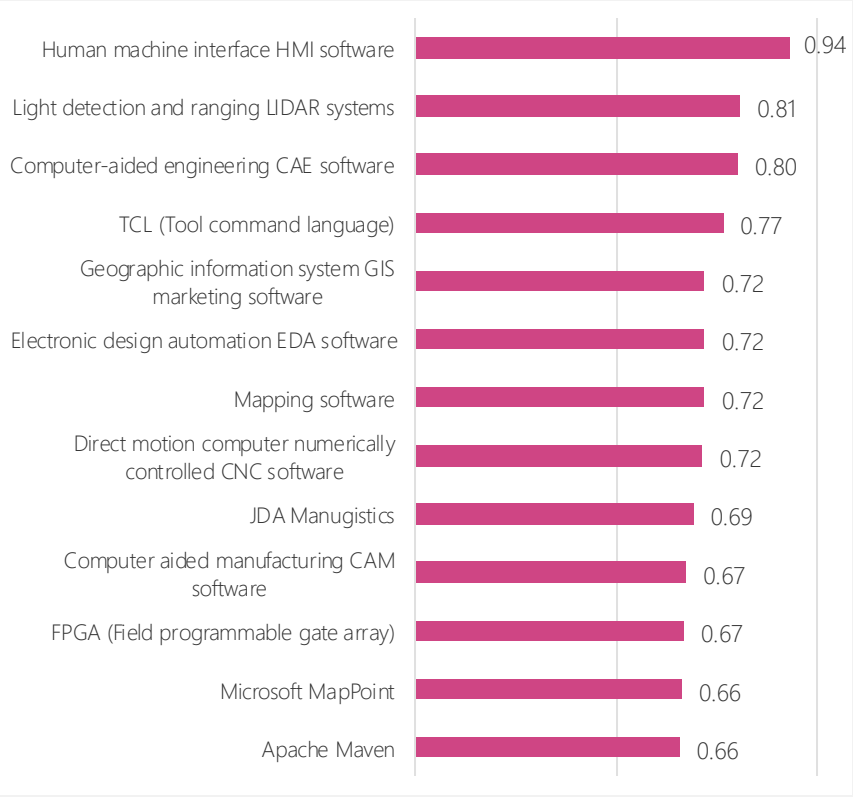
Low labour force gaps indicate sufficient availability of workers in the labour market compared to what employers demand. Low gaps are prominent for power engineers and power systems operators as well as electrical power line and cable workers, both of which are relevant to mining activities.



Note: The size of the bubble indicates the relative magnitude of the expected occupational gap for each occupation. The employment numbers denote employment for a combination of industries and occupations relevant to the sector.

Expected Skills Gap, 2023-32[15]

- Based on occupational gaps, skills gap is derived as the difference between skills demand and supply projections. This helps identify emerging technical skills for the next ten years (2023-32).
- Presented below are standardized scores to illustrate skills where the highest gaps are expected, such as LIDAR, CAE, etc., indicating potential need for skill development.

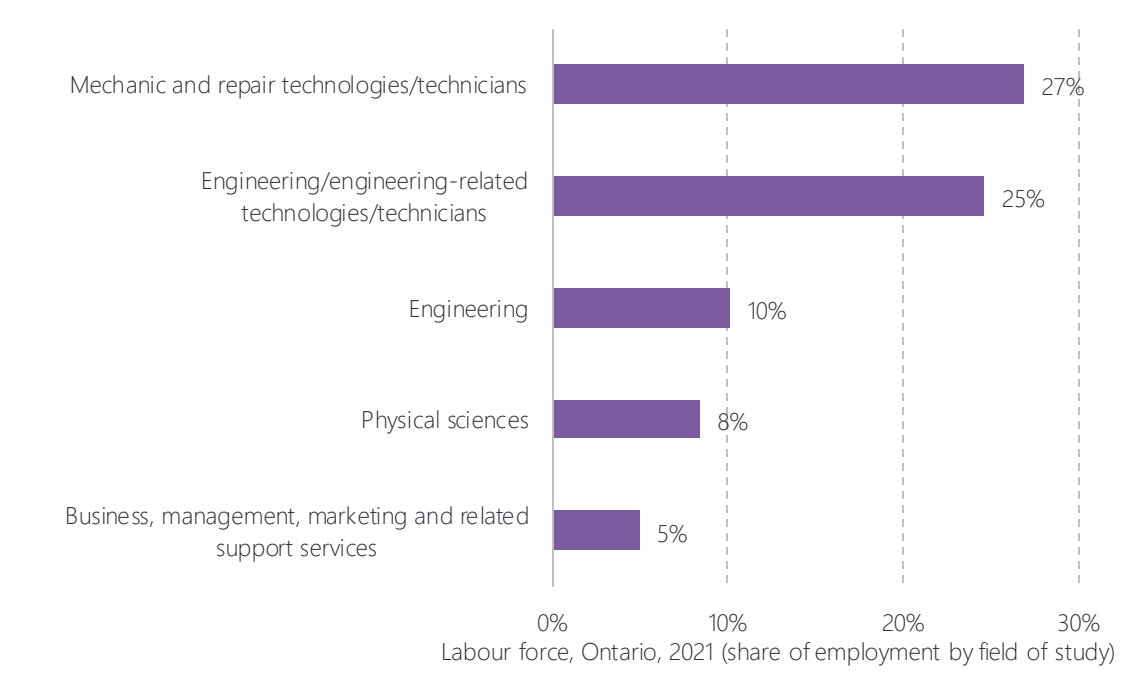


Note: Please see Methodology and Data Limitations section on page 13 for further detail on the skills gap analysis.

Training and Education Requirements and Programs

Workforce Education Profile and Requirements[16]

- The most common field of study among workers in the metal ore and mining sector is mechanic and repair technologies and technicians programs, which accounts for 27% of all workers who completed a study program.
- Additionally, a combined 35% of employees studied engineering, engineering technologies and related fields.
- Further, 8% of workers in the segment studied physical sciences, while 5% studied business or other related fields.



Labour force, Ontario, 2021 (share of employment by field of study)

Note: Engineering comprises of instructional programs that prepare individuals to apply mathematical and scientific principles to the solution of practical problems. Engineering technologies/technicians comprises of instructional programs that prepare individuals to apply basic engineering principles and technical skills in support of engineering and related projects.

Talent and Workforce Development Programs in Ontario[17]

Below is a selection of programs, trainings and certificates across Ontario geared towards current and aspiring workers in the metals and mining sector.

Collège Boréal
- Construction engineering technology - civil and mining
- Construction engineering technician – civil
- Construction technician in mining and civil

Cambrian College
- Mining Engineering Technician
- Mining Engineering Technology

Fleming
- Blasting Techniques
- Geological Technician
- Resources Drilling Technician

Northern College
- Mineral Exploration Techniques
- Mining Engineering Technician

MiHR – Mining Industry Human Resources Council
- The Canadian Mining Certification Program
- Mining Essentials
- Mining Potential
- Common Competency Training

NORCAT
- Mining Common Core Training

Canadian Safety Group Inc.
- Surface Miner Common Core Program

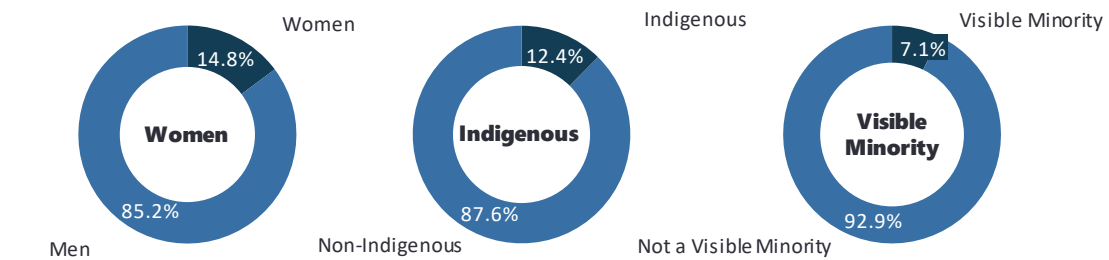
OSSGA – Ontario Stone, Sand & Gravel Association
- Common Core Surface Miner Training Online

Workplace Safety North
- Mining Common Core for First Line Supervisors

Equity, Diversity, and Inclusion

Current Minority Groups Representation in Mining[18]

Women and visible minorities are underrepresented in Ontario's mining sector in 2021, and Indigenous representation is higher than Ontario average representation for all industries.



Current Initiatives Across Canada

Public organizations and private companies have developed various initiatives to promote equity, diversity and inclusion (EDI) in the Canadian mining sector going forward.

MiHR RHiM

The Mining Industry Human Resource Council facilitates various diversity initiatives, including the Indigenous Awareness Training, Gender Equity in Mining Works program, and Intercultural Awareness Training, in Canada.

The Mining Association of Canada
ADVOCACY STEWARDSHIP COLLABORATION

The Towards Sustainable Mining program ensures employees are educated on the history of Indigenous peoples, and receive skills-based training on intercultural competency and human rights.

Cameco

Cameco facilitates the Unconscious Bias training to all employees, training them to recognize commonly held biases in male-dominated fields, and promoting inclusivity in the workforce.

Teck

Teck Resources has brought together new Inclusion and Diversity Committees, where employee resource groups can get support and lead EDI initiatives. Currently, it focuses on women and Indigenous peoples inclusion.

PAN AMERICAN SILVER

Pan American Silver has rolled out the Building Respect Together program, to promote EDI. It also has training programs and scholarships to help grow the pool of women in mining-related careers.

PDAC | iWomen in Mining CANADA

Every year, the Prospectors & Developers Association of Canada, along with Women in Mining Canada, host an annual Mining for Diversity awards ceremony and networking event for industry professionals in the field.

Organizations worldwide are promoting EDI in mining

IWiM

International Women in Mining aims to lead the charge towards gender equality in mining advocating for representation and empowering women with field knowledge.

WiM USA

Women in Mining USA is a national organization that advocates for a more diverse, equitable, and inclusive industry, by empowering and educating women in the field.

ICMM

The International Council on Mining and Minerals supports EDI by advocating for improved EDI company performance and eradication of workplace discrimination.

Stakeholders in the sector are improving EDI by[19,20,21,22]

Fostering a Culture of Diversity and Inclusion

Companies in the sector seek to create an inclusive workforce by promoting internal policies, allowing for current and potential workers to feel included regardless of their background or gender.

Engaging with Indigenous Communities

The proximity of mining projects in Ontario to Indigenous communities presents an opportunity to create jobs and foster mutually beneficial partnerships. As part of Resource Revenue Sharing, there are 142 active agreements that enable Indigenous communities to receive a share of revenues generated from mining. These agreements support economic development and increase opportunities for Indigenous people.

Opportunities to increase women's representation in mining include[23,24]

Providing Women with Information Platforms

Stakeholders can support this by developing information materials and creating educational partnerships so that women may have accessible knowledge of open opportunities in the field.

Addressing Women Turnover Rate

Companies can implement internal policies to support an inclusive workforce for women where working conditions and advancement opportunities are fair and equitable regardless of gender.

Promoting Women in Leadership Positions

Companies in the field can make an active effort to promote women's representation in leadership positions across all levels, ensuring a platform for women's advocacy in the workplace.

About OVIN

Leading Ontario's Automotive and Mobility Transformation

The automotive industry is undergoing a significant shift, with technological advances and evolving mobility preferences redefining its future.

OVIN, led by the Ontario Centre of Innovation (OCI), is supported by the Government of Ontario's Ministry of Economic Development, Job Creation and Trade (MEDJCT), Ministry of Labour, Immigration, Training and Skills Development (MLITSD) and Ministry of Transportation (MTO). Through OVIN, Ontario is at the forefront of the automotive and mobility sector's transformation. OVIN capitalizes on the economic potential of advanced automotive technologies and smart mobility solutions such as connected and autonomous vehicles, and electric and low-carbon vehicle technologies, while enabling the province's transportation and infrastructure networks to plan for and adapt to this evolution.

OVIN is accelerating the development and commercialization of next generation electric, connected and autonomous vehicle and mobility technologies and supporting Ontario's role as the manufacturing hub of Canada, while leveraging critical minerals development in Ontario's North.

OVIN has five main objectives:

1. Foster the commercialization of Ontario-made advanced automotive technologies and smart mobility solutions

2. Showcase the Province of Ontario as the leader in the development, testing, piloting and adoption of the latest transportation and infrastructure technologies

3. Drive innovation and collaboration among stakeholders at the convergence of automotive and technology

4. Leverage and retain Ontario's highly skilled talent, and prepare Ontario's workforce for jobs of the future in the automotive and mobility sectors

5. Harness the Province of Ontario's regional strengths and capabilities, and bridge its automotive and technology clusters to promote the development of EV and power train technologies in Ontario

OVIN TEAM

Automotive & Mobility Team

Raed Kadri
Vice President Strategic Initiatives and Head of OVIN
rkadri@oc-innovation.ca

Mona Eghanian
Assistant Vice President, OVIN
meghanian@oc-innovation.ca

Ghazal Momen
Manager, Implementation and Delivery
gmomen@oc-innovation.ca

Kathryn Tyrell
Manager, Automotive and Mobility Strategy (on leave)
ktyrell@oc-innovation.ca

Shane Daly
Automotive and Portfolio Manager
sdaly@oc-innovation.ca

Natalia Rogacki
Portfolio Manager, Automotive and Mobility
nrogacki@oc-innovation.ca

John George
Sector Manager, Automotive and Mobility
jgeorge@oc-innovation.ca

Greg Gordon
Director, Strategic Partnerships
ggordon@oc-innovation.ca

Stephanie Rodrigues
Manager, Strategic Initiatives
srodrigues@oc-innovation.ca

Joelle Monje
Outreach and Engagement Specialist
jmoje@oc-innovation.ca

Homeira Afshar
Research and Insights Analyst
hafshar@oc-innovation.ca

Shirin Sabahi
OVIN Team Coordinator
ssabahi@oc-innovation.ca

Skills, Talent & Workforce Development Team

Natalia Lobo
Project Manager
nlobo@oc-innovation.ca

Aleque Juneau
Project Lead Workforce Development
ajuneau@oc-innovation.ca

Shannon Miller
Project Lead, Strategic Partnerships
smiller@oc-innovation.ca

Rodayna Abuelwafa
Project Lead, Skills Development
rabuelwafa@oc-innovation.ca

Deepan Parikh
Technical Analyst
dparikh@oc-innovation.ca

Methodology and Data Limitations

Methodology

An overview of the methodology of the analysis is presented below:

- **Skill gaps** were defined based on the average occurrence rate of a skill in job posting related to the segment and the average occurrence rate of the same skill in relevant job seeker profiles. Occurrence rate is the frequency or percentage of job postings that mention a given skill, tool, or technology, in relevant occupations. Skill gaps where demand exceeded supply are included in the report.
- **Occupational demand** is projected based on industry's forecasted growth as per Oxford Economics, in combination with expected changes in the demand for workers, including annual change in employment by occupation and replacement demand. Replacement demand is based on estimated rates of exit from the labour force due to retirement, emigration or death. Exit rates are based on the Canadian Occupational Projection System (COPS) data.
- **Occupational supply** is projected based on three distinct sources: school leavers (i.e. postsecondary graduates and apprenticeship completions), immigrants, and job changers (i.e. individuals currently in the workforce who may enter the sector).
- **Occupational labour gaps** were determined subtracting total projected supply from total projected demand across all forecast years (2023-2032).The skills outlook was based on occupational projections for a common set of skills available in both job postings (demand) and job seeker profiles (supply).
- **The degrees required by employers** in metal ore mining are reflected in the most common fields of study for workers currently employed in the segment. These fields are identified by triangulating field of study (CIP), occupation (NOC), and industry (NAICS) data.

Data Limitations

Identified limitations with the datasets and approach used in the analysis include:

- Skills data were collected from Vicinity Jobs, a labour market analytics firm, at the level of occupations (4-digit NOC) and grouped into occupation categories based on the similarity of their roles within each segment of the automotive and mobility sector, including information regarding the education level and workforce characteristics (e.g., skills, knowledge, tools & technology) required in postings by occupation.
- The analysis of skills was limited by the availability and completeness of data. There were gaps in terms of job posting and job seeker profiles in Vicinity Jobs data, which means that the estimations of skills demand, supply, and gap should be considered as a ranking rather than a definitive estimation.
- Future skill insights were limited by the skills present in current state data from job posting and job seeker profiles, meaning "new" skills that are not related to occupations in the present could not be identified.
- The data used for the analysis of representation of women, visible minorities, and Indigenous groups in Ontario's employment by industry and by occupation is sourced from Statistics Canada's latest Census from 2021. Data for non-binary gender groups are not available at the level of granularity in this analysis.

References

[1] Natural Resources Canada (2021). Annual Statistics of Mineral Production. Retrieved from https://mmsd.nrcan-rncan.gc.ca/prod-prod/ann-ann-eng.aspx

[2] Ontario Mining Association (2022). Ontario Mining Operations 2022. Retrieved from https://oma.on.ca/en/ontario-mining/Map.aspx

[3] Crawley, Mike (2022, March 17). Doug Ford unveils strategy for 'critical minerals,' worth $3.5B to Ontario economy. Retrieved from https://www.cbc.ca/news/canada/toronto/ontario-critical-minerals-strategy-doug-ford-1.6386775

[4] Government of Ontario (2022, September 19). Ontario Critical Minerals Strategy 2022-2027: Unlocking potential to drive economic recovery and prosperity. Retrieved from https://www.ontario.ca/page/ontarios-critical-minerals-strategy-2022-2027-unlocking-potential-drive-economic-recovery-prosperity

[5] Government of Ontario (2022, September 20). Driving Prosperity: The Future of Ontario's Automotive Sector. Retrieved from https://www.ontario.ca/page/driving-prosperity-future-ontarios-automotive-sector

[6] Centre of Training Excellence in Mining (2022, May). Skills Roadmap Project. Retrieved from https://bc-ctem.ca/wp-content/uploads/CTEM_SRMP-Final-Report_Nov-30-2022.pdf

[7] Government of Ontario (2022, September 19). Ontario Critical Minerals Strategy 2022-2027: Unlocking potential to drive economic recovery and prosperity. Retrieved from https://www.ontario.ca/page/ontarios-critical-minerals-strategy-2022-2027-unlocking-potential-drive-economic-recovery-prosperity

[8] Ontario Mining Association (2022). Ontario Mining Operations 2022. Retrieved from https://oma.on.ca/en/ontario-mining/Map.aspx

[9] Statistics Canada and EY Analysis.

[10] Statistics Canada and EY Analysis.

[11] Statistics Canada and EY Analysis.

[12] Statistics Canada, Census 2021, and EY Analysis.

[13] Vicinity Jobs, O*NET Database, and EY Analysis

[14] Statistics Canada, Vicinity Jobs, Oxford Economics and EY Analysis.

[15] Statistics Canada, Vicinity Jobs, Oxford Economics and EY Analysis.

[16] Statistics Canada and EY Analysis.

[17] Ontario College Application Service (n.d.). Ontario Colleges, Mining Programs. Retrieved from https://www.ontariocolleges.ca/en/programs/professions-and-trades/mining

Collège Boréal (n.d.). Engineering and Technology Programs. Retrieved from https://www.collegeboreal.ca/en/programs/engineering-and-technology

Cambrian College (n.d.). Engineering Technology Programs. Retrieved from https://cambriancollege.ca/programs/?item=item-engineering-technology#browse-programs-by-field

Fleming College (n.d.). Programs A-Z. Retrieved from https://flemingcollege.ca/programs/a-z

Northern College (n.d.). Programs. Retrieved from https://www.northerncollege.ca/programs/

Mining Industry Human Resources Council (n.d.). Retrieved from Standards, Training & Recognition. Retrieved from https://mihr.ca/standards-training-recognition/

NORCAT (n.d.). Mining Common Core Training. Retrieved from https://www.norcat.org/training/common-core-training.html

References

[17] Canadian Safety Group Inc. (n.d.). Surface Miner Common Core Program. Retrieved from https://www.canadiansafetygroup.com/courses/category/new-worker-safety-basics/course/surface-miner-common-core-program-770210

Ontario Stone, Sand & Gravel Association (n.d.). Common Core Surface Miner Training Online. Retrieved from https://ossga.com/cca/

Workplace Safety North (n.d.). Mining Common Core for First Line Supervisors. Retrieved from https://www.workplacesafetynorth.ca/training/mandatory-skills-training/mining-common-core-first-line-supervisors

[18] Statistics Canada, Census 2021, and EY Analysis.

Mining Industry Human Resources Council (n.d.). Inclusion & Diversity. Retrieved from https://mihr.ca/inclusion-diversity/

The Mining Association of Canada (n.d.). Towards Sustainable Mining. Retrieved from https://mining.ca/towards-sustainable-mining/

Cameco (2021). Energizing a Clean-Air World: 2021 ESG Report. Retrieved from https://s3-us-west-2.amazonaws.com/assets-us-west-2/sustainability-report/2021_Report/Cameco_2021_ESG_Report.pdf

Teck (2020). Building an Inclusive and Diverse Workplace for Everyone. Retrieved from https://www.teck.com/news/connect/issue/volume-30,-2020/table-of-contents/building-an-inclusive-and-diverse-workplace-for-everyone

Pan American Silver (n.d.). Inclusion & Diversity. Retrieved from https://www.panamericansilver.com/sustainability/social/inclusion-and-diversity/

Prospectors & Developers Association of Canada (2023). Mining for Diversity Event. Retrieved from https://www.pdac.ca/convention/events-networking/mining-for-diversity

Women in Mining Canada (n.d.). Who Are We?. Retrieved from https://wimcanada.org/who-we-are/

International Women in Mining (n.d.). International Women in Mining. Retrieved from https://internationalwim.org/

Women in Mining USA (n.d.). Women in Mining USA. Retrieved from https://www.womeninmining.us/

International Council on Mining and Metals (n.d.). Diversity, Equity and Inclusion. https://www.icmm.com/en-gb/our-work/social-performance/diversity-equity-and-inclusion

[19] International Labour Organization (2021). Women in mining: Towards gender equality. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_821061.pdf

[20] Mining Industry Human Resources Council (2016). Exploring Gender Inclusion. Retrieved from https://mihr.ca/wp-content/uploads/2020/03/MiHR_Gender_Report_EN_WEB.pdf

[21] Government of British Columbia (n.d.). Indigenous Engagement. Retrieved from https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/permitting/mines-indigenous-engagement

[22] Government of Canada (2022, December 22). Our critical minerals strategic partnerships. Retrieved from https://www.canada.ca/en/campaign/critical-minerals-in-canada/our-critical-minerals-strategic-partnerships.html

Government of Ontario (2022, September 19). Ontario Critical Minerals Strategy 2022-2027: Unlocking potential to drive economic recovery and prosperity. Retrieved from https://www.ontario.ca/page/ontarios-critical-minerals-strategy-2022-2027-unlocking-potential-drive-economic-recovery-prosperity

[23] International Labour Organization (2021). Women in mining: Towards gender equality. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_821061.pdf

[24] Mining Industry Human Resources Council (2016). Exploring Gender Inclusion. Retrieved from https://mihr.ca/wp-content/uploads/2020/03/MiHR_Gender_Report_EN_WEB.pdf

Disclaimer

This report was commissioned by the Ontario Centre for Innovation (OCI) through a Request for Proposals titled "Labour Market Research Insights: Talent & Workforce Strategy Update," dated September 30, 2022, and has been prepared by a third-party vendor.

In preparing this report, we have relied on information provided by others, and we do not accept responsibility for the content, including accuracy and completeness, of such information.

We emphasize that any forward-looking projections or forecasts are based on interpretations or assessments of available information at the time of writing this report. Therefore, readers and recipients of this report should not place undue reliance on the report and are cautioned to perform their own due diligence, investigations, and analysis before placing reliance on it.

Ontario Centre of Innovation

www.oc-innovation.ca

Ontario Vehicle Innovation Network (OVIN)

www.OVINhub.ca www.ovin-navigator.ca

325 Front St W, Suite 300, Toronto, ON M5V 2Y1

416-861-1092 1-866-759-6014