



Key Elements

Nurturing a critical minerals workforce with lessons from British Columbia, Alberta and Ontario

December
2025

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Recommended citation: Megan, Gordon and Mercer Pommer. Key Elements: Nurturing a critical minerals workforce with lessons from British Columbia, Alberta and Ontario. The Pembina Institute, 2025.

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Acknowledgements

The Pembina Institute wishes to thank Natural Resources Canada for their generous support. We would also like to thank the industry experts who lent us their time to corroborate our conclusions as part of this work.

The Pembina Institute recognizes that the work we steward and those we serve span the lands of many Indigenous Peoples. We respectfully acknowledge that our organization is headquartered in the traditional territories of Treaty 7, comprising the Blackfoot Confederacy (Siksika, Piikani and Kainai Nations); the Stoney Nakoda Nations (Goodstoney, Chiniki and Bearspaw First Nations); and the Tsuut’ina Nation. These lands are also home to the Otipemisiwak Métis Government (Districts 5 and 6).

These acknowledgements are part of the start of a journey of several generations. We share them in the spirit of truth, justice and reconciliation, and to contribute to a more equitable and inclusive future for all.

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Executive Summary

Canada's critical minerals sector offers a historic opportunity to create sustainable jobs, secure energy sovereignty, and build a resilient and competitive economy. Global demand for critical minerals is booming, with demand from clean technologies alone projected to nearly double by 2030 and triple by 2040.

Canada is well-positioned to play a leading role across the entire critical minerals value chain as part of its nation-building agenda. However, this potential is at risk.

The sector faces serious workforce challenges, including an aging workforce, declining enrollment in mining-related educational programs, and barriers to labour participation such as remote work locations. In 2023, the minerals and metals sector supported over 700,000 jobs, yet it struggles to recruit, train, and retain a steady supply of workers.

In this report, we examined the current state of Canada's critical minerals sector across the value chain. We also analyzed the critical minerals strategies of four governments (Canada, B.C., Alberta, and Ontario) to see how they address workforce development, as well as multi-stakeholder initiatives aimed at strengthening the workforce.

We found that workforce development is most effective when built on collaboration, and there are promising regional initiatives that could be replicated and scaled up to meet future needs and deliver tangible benefits to local communities. However, current efforts to grow the workforce remain piecemeal and underfunded, and national coordination remains limited.

To ensure that the sector reaches its full potential, industrial strategies must be matched with effective workforce development interventions. This requires stronger emphasis and greater investment in workforce development programs as integral components of national and provincial critical minerals strategies.

By acting now to develop well-funded, coordinated policy initiatives focused on the critical minerals workforce, Canada can position itself as a global leader in the sector — creating high-quality jobs and driving economic growth in an environmentally responsible manner that respects Indigenous sovereignty.

1. Introduction

Canada has a generational opportunity to create sustainable jobs, strengthen energy sovereignty and support economic resilience by expanding its critical minerals sector. With global demand rising for critical minerals in the clean energy, healthcare, and digital sectors, Canada is well-positioned to play a leading role in international value chains.

Strategic policy interventions and targeted investment in the sector can yield significant economic and employment benefits for the country. Labour market challenges, however, could compromise this potential. The sector has been struggling to replace its aging workforce, improve working conditions, and overcome barriers to job entry.

As the federal government considers fast-tracking critical minerals projects through its new Major Projects Office, it is vital that labour and environmental protections are upheld, transparency and accountability strengthened, and Indigenous rights respected.¹ Success of the sector will require coupling an ambitious nation-building agenda with robust workforce development strategies that create skilled, readily available workers. This would deliver both economic and social benefits, including quality jobs, revenue for local communities and Indigenous governments, and greater investment in northern communities.

In this report, we provide an overview of the current state of the critical minerals sector in Canada across the value chain, including extraction and processing. We outline strategies by governments to promote growth in the sector and examine industry-led, collaborative initiatives to strengthen the workforce, noting examples from British Columbia, Alberta, and Ontario. We then assess these critical minerals strategies and initiatives using the lessons from our recent report *Recruit, Train, Retain*, highlighting best practices within each unique context.²

¹ Government of Canada, “Major Projects Office of Canada: Initial Projects under Consideration,” modified September 12, 2025. <https://www.canada.ca/en/one-canadian-economy/news/2025/09/major-projects-office-of-canada-initial-projects-under-consideration.html>

² Megan Gordon, *Recruit, Train, Retain: Fostering low-carbon industries through regional workforce planning* (Pembina Institute, 2025). <https://www.pembina.org/pub/recruit-train-retain>

2. Canada's critical minerals growth potential

2.1 Critical minerals in Canada

Critical minerals are key to securing Canada's position in global supply chains for the energy transition — especially when it comes to unlocking opportunities in Canada's electric vehicle and battery manufacturing sectors.

Canada has deemed 34 minerals as “critical” based on criteria such as having few or no substitutes, holding strategic value, being found in limited quantities or being concentrated in specific areas.³ These 34 minerals are the backbone of the low-carbon economy; they are essential for electric vehicle batteries, energy storage technology, electrical wiring and wind turbines, among other applications. They are also of vital use in technological components in the digital and health sectors.

Critical minerals encompass a growing share of Canada's broader minerals and metals sector. Of around 200 producing mines in Canada, 56 are critical mineral mines, and in 2024, 48% of exploration spending was aimed at critical minerals.⁴ As of September 2024, an additional 67 critical mineral mining projects worth an estimated \$72.4 billion in potential investment have been proposed.⁵

Canada has an international advantage in that it possesses some of the largest global reserves of minerals like nickel, lithium, cobalt and graphite, and it is one of the only western nations where they are abundant.⁶ Since many mineral deposits are concentrated in a few regions, disruptions from wars, natural disasters and other catastrophic events can put entire global supply chains at risk. Canada's relatively stable economy, abundant mineral resources, and history and expertise in mining have the potential to create a welcoming investment environment to spur industrial activity.

³ Government of Canada, “Canada's Critical Minerals,” May 5, 2025. <https://www.canada.ca/en/campaign/critical-minerals-in-canada/critical-minerals-an-opportunity-for-canada.html>

⁴ Government of Canada, “Canadian Critical Minerals Strategy Annual Report 2024,” September 25, 2024. <https://www.canada.ca/en/campaign/critical-minerals-in-canada/canadas-critical-minerals-strategy/canadian-critical-minerals-strategy-annual-report-2024.html>

⁵ Government of Canada, “Natural Resources: Major Projects Planned or Under Construction 2024 to 2034,” February 12, 2025. <https://natural-resources.canada.ca/science-data/data-analysis/natural-resources-major-projects-planned-under-construction-2024-2034>

⁶ Government of Canada, “The Canadian Critical Minerals Strategy,” modified September 12, 2023. <https://www.canada.ca/en/campaign/critical-minerals-in-canada/canadian-critical-minerals-strategy.html>

2.1.1 Industry growth potential

The growth potential for critical minerals is substantial, with global demand for use in clean technologies alone projected to nearly double by 2030 and triple by 2040 if governments meet their energy and climate targets.⁷ In 2024, Canada exported \$49.4 billion of critical minerals products,⁸ with just six priority minerals – cobalt, copper, lithium, nickel, graphite, and rare earth elements – making up \$8 billion of production value.⁹ By 2040, annual production value of those six could reach \$43 billion.¹⁰ The battery supply chain on its own could contribute between \$5 billion and \$24 billion to GDP per year through 2030, generating between 18,500 to 81,000 direct jobs.¹¹

Industry professionals and other experts largely agree that investment in the sector is insufficient to meet projected future demand, and that project- and market-level barriers must be addressed to achieve growth.¹² In 2040, domestic demand for priority critical minerals could reach \$16 billion,¹³ and an estimated \$30 billion in public and private capital for extraction and improved environmental sustainability performance will be needed to meet that demand.¹⁴

Given that many mining projects are located in remote northern communities and on Indigenous land, a stronger critical minerals sector could create more opportunities for Indigenous people to participate in and own projects, providing local jobs and revenue. These opportunities, however, should align with the United Nations Declaration on the Rights of Indigenous Peoples, as well as the Truth and Reconciliation Commission of Canada: Calls to

⁷ This is the International Energy Agency's (IEA's) "Announced Pledges Scenario (APS)." Under the more conservative "Stated Policies Scenario (STEPS)," demand reaches 1.6x by 2030 and 2x by 2040; under the more optimistic "Net Zero Emissions by 2050 Scenario (NZE)," demand reaches 2.4x by 2030 and 3.4x by 2040.

IEA, "Critical Minerals Dataset," spreadsheet, May 2025. <https://www.iea.org/data-and-statistics/data-product/critical-minerals-dataset>

⁸ Natural Resources Canada, *Mineral Trade Information Bulletin* (2025), modified October 22, 2025. <https://natural-resources.canada.ca/maps-tools-publications/publications/mineral-trade>

⁹ These six minerals were identified as priority minerals in the *Canadian Critical Minerals Strategy* for their potential to spur economic growth be a part of priority supply chains.

Calvin Trottier-Chi, "Canada's energy transition will demand \$16 billion worth of critical minerals by 2040," *440*, August 9, 2024. <https://440megatonnes.ca/insight/canada-critical-minerals-clean-energy-transition/>

¹⁰ "Canada's energy transition will demand \$16 billion worth of critical minerals by 2040."

¹¹ These numbers grow to between 79,000 and 323,000 when indirect and induced jobs are included.

Trillium Network & Clean Energy Canada, *Developing Canada's Electric Vehicle Battery Supply Chain: Quantifying the economic impacts and opportunities* (2022). https://cleanenergycanada.org/wp-content/uploads/2022/09/Report_SupplyChainReport_vf_20220705.pdf

¹² Ariane Bourassa and Jonathan Arnold, "What is holding back investment in Canadian critical minerals?," *Canadian Climate Institute*, March 10, 2024. <https://climateinstitute.ca/what-holding-back-canada-critical-minerals/>

¹³ Aggregated based on market value of the six priority critical minerals listed above.

¹⁴ "Canada's energy transition will demand \$16 billion worth of critical minerals by 2040."

Action.¹⁵ Respecting Indigenous self-determination and following clear parameters for Indigenous engagement can advance reconciliation, reduce investor risk, and foster fruitful partnerships with Indigenous nations.¹⁶

2.1.2 Opportunities across the critical minerals value chain

Figure 1 illustrates Canada’s critical minerals value chain. Each stage operates at a different scale and level of maturity. The upstream phase is the largest and most established economic contributor.



Figure 1. Critical minerals value chain

Source: Natural Resources Canada¹⁷

In 2024, Canada had 56 active critical mineral mines, operated by 33 companies and covering 18 critical minerals. It also had intermediate processing capacity for 20 critical minerals across 26 facilities. An additional 151 projects were at an advanced stage. These included exploration and permitting activities, as well as facilities that could expand Canada’s processing capacity to include another six critical minerals and battery recycling.¹⁸

¹⁵ BC First Nations Energy and Mining Council, *First Nations Critical Minerals Strategy* (2024).

<https://fnemc.ca/wp-content/uploads/2024/07/First-Nations-Critical-Minerals-Stratgy-BC-FN-Energy-Mining-Council-Mar-4-2024.pdf>

¹⁶ Marisa Beck et al., *Critical Path: Securing Canada’s Place in the Global Critical Minerals Race* (Canadian Climate Institute, 2025), vi. <https://climateinstitute.ca/wp-content/uploads/2025/06/Critical-path-Canadian-Climate-Institute.pdf>

¹⁷ “Canada’s Critical Minerals.”

¹⁸ “Canada’s Critical Minerals Strategy Annual Report 2024.”

Natural Resources Canada, “Canada’s Critical Minerals Map,” *Atlas of Canada*, modified February 22, 2023. <https://atlas.gc.ca/critical-minerals/en/>

Canada's critical minerals activity is dominated by the upstream sector, with most minerals being exported in raw or refined form, with little-to-no further value-added manufacturing. In 2024, Canada exported \$36.8 billion in raw and smelted materials (e.g., ores and metals), but exported only \$12.5 billion in semi-fabricated products (e.g., wires and tubes).¹⁹ Many battery minerals mined in Canada, such as nickel, are shipped to other countries for processing and either return to Canada for final assembly into batteries or stay in the export country. Enhancing domestic processing and manufacturing would add value to these minerals, increase labour productivity, and broaden market demand for Canadian exports.²⁰ For this reason, the United Steelworkers of Canada has called for a "mine to mill" approach: creating a full critical minerals value chain locally. The private-sector union has also focused on sustainability, promoting the use of the clean grids in provinces like Ontario and B.C. to decrease the emissions from mining activity.²¹

¹⁹ *Mineral Trade Information Bulletin*.

²⁰ Travis Southin, *The Productivity Benefits of High-Value, Low-Carbon Investment* (The Transition Accelerator, 2025). <https://transitionaccelerator.ca/wp-content/uploads/2025/06/The-Productivity-Benefits-of-High-Value-Low-Carbon-Investment.pdf>

²¹ United Steelworkers, "Submission to Canada's Critical Mineral Strategy," 2022. <https://usw.ca/wp-content/uploads/2022/09/2022-09-15-USW-Critical-Minerals-Submission-NRCAN-091522-Final.pdf>

3. The critical minerals workforce

The available economic and workforce data covers the broader minerals and metals industry and lacks the detail needed to provide labour market insights for the critical minerals sector. Therefore, this section relies primarily on general industry data, focusing on mining-related labour market dynamics based on reporting by the Mining Industry Human Resources Council (MiHR).

3.1 Employment levels

In 2023, the minerals and metals sector in Canada employed 430,000 workers directly and another 281,000 indirectly, for a total of 711,000 workers. This means that about 1 in 30 workers in Canada was directly or indirectly employed in the sector.²² Indigenous workers represent 9.8% of the minerals and metals workforce, while women represent 15.7%.²³ Jobs in the sector offer high wages, with an average yearly salary of \$144,630 — nearly double the national average.²⁴

Employment is distributed across different stages of the value chain. In 2023, most of the jobs were in downstream manufacturing (218,649), followed by mining (114,102), then primary manufacturing (96,824). See Figure 2.

²² Based on total employment (seasonally adjusted) in July 2025.

Statistics Canada, “Table 14-10-0287-01: Labour force characteristics, monthly, seasonally adjusted and trend-cycle.” <https://doi.org/10.25318/1410028701-eng>

²³ Mining Industry Human Resources Council (MiHR), *Equity Deserving Groups in Canada’s Mining Industry* (2024). <https://mihr.ca/wp-content/uploads/2024/04/Mihr-Equity-Deserving-Groups-2024-EN.pdf>

²⁴ Natural Resources Canada, “Minerals and the economy.” <https://natural-resources.canada.ca/minerals-mining/mining-data-statistics-analysis/minerals-economy>

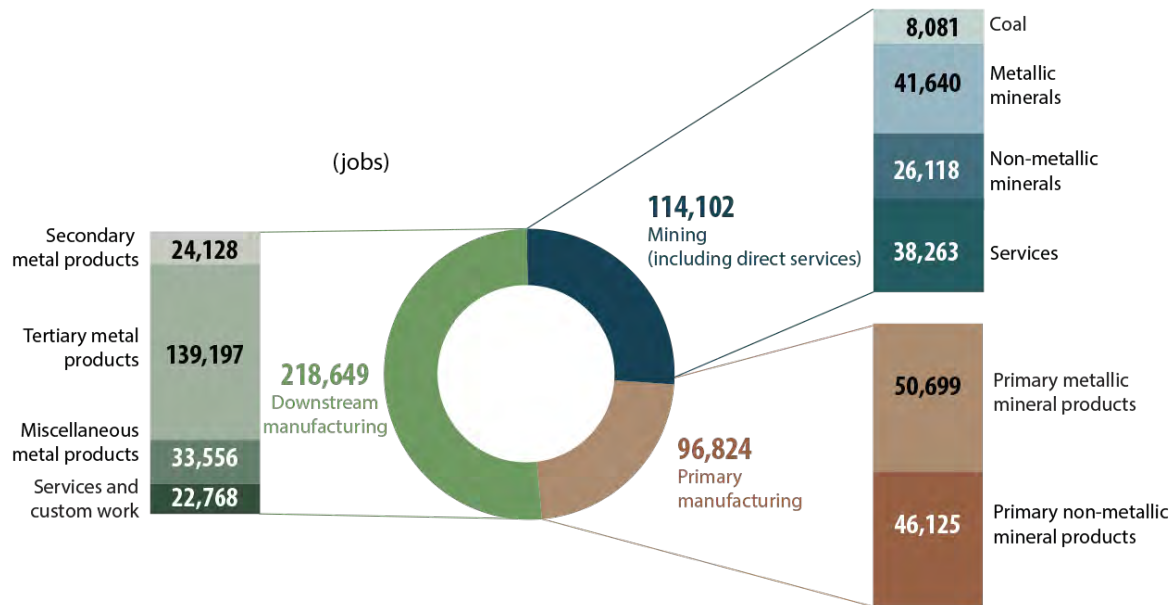


Figure 2. Minerals and metals sector direct employment, by subsector and product group, 2023

Source: Government of Canada²⁵

Mining workforce overview in Canada

Mining is a key activity in both the critical minerals value chain and the broader minerals and metals sector.

- 189,000 workers employed in mining as of 2023, a 64% increase since 1999.²⁶
- 40% increase in labour productivity between 2012 and 2021, reflecting a shift toward mining operations that are more capital (and less labour) intensive.²⁷
- 3 to 26% projected employment growth in mining by 2034 from 2023, depending on the scenario (baseline to expansionary).²⁸
- Nearly 25% of the workforce are underground miners, making it the largest occupational group. Other major occupations include heavy-duty mechanics, construction millwrights and industrial mechanics.²⁹

(continued)

²⁵ “Minerals and the economy.”

²⁶ MiHR, *Canadian Mining Outlook – 2024* (2024). <https://mihr.ca/wp-content/uploads/2024/04/Mihr-Outlook-2024-EN.pdf>

²⁷ MiHR, *Canadian Mining Workplace Profile – 2024* (2024). <https://mihr.ca/wp-content/uploads/2024/04/MiHR-Workplace-EN-2024-Final.pdf>

²⁸ *Canadian Mining Outlook – 2024*.

²⁹ *Canadian Mining Workplace Profile – 2024*.

- 20% of mining workers were unionized as of 2023, an 8% increase from 2022. However, this increase follows a long-term decline in unionization rates in the natural resources sector over the past two decades.³⁰
- 17% of workers in the mining and quarrying industry hold a university degree (highly skilled), 49% hold a trades certificate or diploma (medium-skilled), and 34% have a high school education or no formal education (low-skilled).³¹

3.2 Labour market challenges in mining

3.2.1 Aging workforce and youth recruitment

The critical minerals sector faces the same labour market challenges as the broader minerals and metals sector, among them an aging workforce. In 2023, one in five mining workers was 55 or older, signalling an impending wave of retirements and urgent need to replace retirees.³² The MiHR projects that the industry will need 48,910 new workers simply to offset retirements by 2034.³³ The sector, however, is not attracting replacements at the pace needed to sustain — or grow — the industry, considering the massive potential for expansion. Fewer people are pursuing mining-related educational programs, as shown by declining enrolments in programs offering a bachelor’s degree in geology or earth sciences, from a peak of 4,797 in 2014 to 2,832 in 2020.³⁴ Similar trends of an aging workforce driving potential future labour shortages are evident further down the supply chain, as seen in Ontario’s automotive manufacturing sector.³⁵

Evidence also suggests that youth negatively view careers in mining due to a perceived lack of workplace safety, limited opportunities for advancement and low awareness of career opportunities.³⁶ A survey of students at a Canadian mining convention found that 47% first learned about mining careers during their post-secondary education, indicating that these

³⁰ *Canadian Mining Workplace Profile – 2024.*

³¹ *Canadian Mining Workplace Profile – 2024.*

³² *Canadian Mining Workplace Profile – 2024.*

³³ Under MiHR’s baseline scenario.

Canadian Mining Outlook – 2024.

³⁴ MiHR, *Spotlight: Geoscientists* (2024). <https://mihr.ca/wp-content/uploads/2024/04/Mihr-Occ-Spotlight-Mining-Geoscientists-EN-2024.pdf>

³⁵ Smart Prosperity Institute, “Skills Needs for Workers in Ontario’s Growing Zero-Emissions Vehicles Sector.” <https://institute.smartprosperity.ca/ZEV-Jobs-Skills-Needs>

³⁶ MiHR, *Perceptions and Interest in a Mining Sector Career* (2023). <https://mihr.ca/wp-content/uploads/2023/10/MiHR-Youth-Perceptions-Survey-Presentation-2023.pdf>

careers were not top of mind in high school when they decided on their educational path.³⁷ Moreover, mining as a career prospect ranks last among students when compared to jobs in sectors like oil and gas, manufacturing, technology and healthcare.³⁸ Recognizing the dangers of a declining supply of new labour market entrants, the MiHR and a coalition of partners have launched “Mining Needs You,” a youth-focused career awareness campaign to increase the visibility and profile of the sector.³⁹

3.2.2 Health, safety, and remote working conditions

The realities of work in the sector present further barriers to entry. Many exploration, geoscience and mining jobs are in remote locations or have fly-in, fly-out (FIFO) work schedules, requiring workers to spend days or weeks away from their home communities. FIFO workers report significantly higher levels of psychological distress, even when compared to workers from other demographically similar industries like construction.⁴⁰ Also, while safety has improved significantly over the past decade, with injuries falling by 14% and fatalities by 38%,⁴¹ it remains a physically, as well as psychologically, demanding work environment.

According to a study of 2,550 mine workers in Western Australia by the Centre for Transformative Work Design at Curtin University, 30% of workers reported high or very high levels of psychological distress, much higher than a benchmark sample of workers from similar industries.⁴² Only 41% of workers reported feeling satisfied with their jobs, which was also lower than the benchmark sample.⁴³ This stems in part from an often difficult work culture where there is a perceived stigma around seeking emotional support, which can lead to social isolation and further mental health challenges.⁴⁴ Bullying was also noted in the study as another persistent problem, with 23% of women and 11% of men indicating that they had experienced

³⁷ MiHR, *From Classroom to Mine Site: A review of Canada's postsecondary education pipeline for the mining sector* (2023), 18. <https://mihr.ca/wp-content/uploads/2023/10/MiHR-Postsecondary-Education-Report-EN-2023.pdf>

³⁸ *Perceptions and Interest in a Mining Sector Career*.

³⁹ MiHR, “Mining Needs You.” <https://miningneedsyou.ca/>

⁴⁰ Cheryl Yam et al., *Mental Awareness, Respect and Safety in the Mining Industry – The Landmark Study: A Review and Synthesis of the Literature* (Centre for Transformative Work Design, 2022). https://www.wa.gov.au/system/files/2022-11/MARS_LMS_Preliminary_Report_2A.pdf

⁴¹ Mining Association of Canada, *The Mining Story 2025: Canadian Mining Industry Facts and Figures* (2025). https://mining.ca/wp-content/uploads/dlm_uploads/2025/05/MAC-Report_2025-final-1.pdf

⁴² Cheryl Yam et al., *The Mental Awareness, Respect and Safety (MARS) Program Landmark Study: Insights from the Worker Survey and Interviews* (Centre for Transformative Work Design & Curtin University, 2023), 21. https://www.wa.gov.au/system/files/2024-03/mars_report_insights_20240312.pdf

⁴³ *The Mental Awareness, Respect and Safety (MARS) Program Landmark Study: Insights*.

⁴⁴ *The Mental Awareness, Respect and Safety (MARS) Program Landmark Study: Insights*, 70.

bullying multiple times per month, underscoring the disproportionately negative experiences of women on job sites.⁴⁵

Another issue with mining site conditions is that behavioural problems that surface in work camps can spill over to local communities if left unaddressed. Some Indigenous communities located near remote work camps have reported instances of gendered violence from camp workers, contributing to mistrust between the industry and local people.⁴⁶

3.2.3 Dependence and volatility

Economic dependence on mining in rural and remote places comes with risks, as mines may become stranded assets due to global market fluctuations in commodity prices and other geopolitical factors. According to a study of B.C. mines, over 40% of all mines permitted and operating since 1995 have spent time in “care and maintenance,” a phase during which production stops and workers are often abruptly laid off due to uneconomic market conditions.⁴⁷ On average, the mines that entered care and maintenance after opening spent 38% of their operating life in that phase, highlighting the need for proactive solutions for workers in the event of layoffs or slowdowns.⁴⁸

3.2.4 Women in the mining sector

The mining sector has consistently struggled to achieve workforce diversity, remaining predominantly white and male.⁴⁹ For nearly two decades, women have represented around 15% of the mining workforce, compared to 47.2% across all industries, with particularly low representation in leadership roles.⁵⁰ In part, this is because mining has a higher share of occupations where women already tend to be under-represented, such as skilled trades.

However, even compared to other fields, mining presents systemic barriers that contribute to negative perceptions or make it a less desirable choice for women. In addition to a lack of role models in the industry, 86% of women reported witnessing or experiencing negative comments,

⁴⁵ *The Mental Awareness, Respect and Safety (MARS) Program Landmark Study: Insights*, 101.

⁴⁶ Karen Vecchio, *Responding to the Calls for Justice: Addressing Violence Against Indigenous Women and Girls in the Context of Resource Development Projects* (House of Commons Standing Committee on the Status of Women, 2022). <https://www.ourcommons.ca/Content/Committee/441/FEWO/Reports/RP12157710/feworp05/feworp05-e.pdf>

⁴⁷ Rosemary Collard, Jessica Dempsey, Youssef Al Bouchi, and Nathan Bawaan, “Does Regulation Delay Mines? A Timeline and Economic Benefit Audit of British Columbia Mines,” *FACETS* 9 (2024). <https://doi.org/10.1139/facets-2024-0083>

⁴⁸ “Does Regulation Delay Mines?”

⁴⁹ *The Mining Story 2025: Canadian Mining Industry Facts and Figures*.

⁵⁰ *Equity Deserving Groups in Canada’s Mining Industry*.

treatment, or actions; 64% reported discrimination, and 37% reported experiencing sexual harassment.⁵¹ A comprehensive Australian literature review found that the high prevalence of sexual harassment and assault in mining was linked to hyper-masculine work sites and organizational culture, which can negatively affect the mental health of both men and women.⁵² FIFO work can pose additional barriers for women, who often take on a higher share of caregiving and other domestic responsibilities, making it harder for them to spend long stretches of time away from home.⁵³

3.2.5 Indigenous people and the mining sector

Indigenous people also face unique issues in the mining sector. They are relatively well-represented in the mining workforce, making up 9.8% of the workforce compared to 3.9% across all other industries.⁵⁴ This share has continued to grow over the past two decades as more efforts have been made to employ local workers from rights-holder communities and communities that surround extraction sites. However, Indigenous workers are more concentrated in production and trades roles than in leadership positions compared to non-Indigenous workers, and their employment levels are often less stable than their non-Indigenous counterparts.⁵⁵ Like women and other equity-deserving groups, Indigenous people are likely to face discrimination in the workplace and have fewer opportunities for advancement. In addition, they face a lack of cultural understanding from peers and supervisors.⁵⁶

Efforts to increase Indigenous representation in the mining workforce is one of many ways to ensure that local communities and rights-holders receive tangible benefits from resource development. It is critical that every stage of the development process involves the free, prior, and informed consent of Indigenous communities, including in the development of environmental standards, reclamation requirements, and financial safeguards against accidents.⁵⁷ Mechanisms such as revenue-sharing agreements, employment requirements, and training for local workers can deliver direct benefits.⁵⁸

⁵¹ *Equity Deserving Groups in Canada's Mining Industry*.

⁵² *Mental Awareness, Respect and Safety in the Mining Industry – The Landmark Study: A Review and Synthesis*.

⁵³ *Equity Deserving Groups in Canada's Mining Industry*.

⁵⁴ *Equity Deserving Groups in Canada's Mining Industry*.

⁵⁵ *Equity Deserving Groups in Canada's Mining Industry*.

⁵⁶ Amanda Thompson, *Fly-In, Fly-Out Labour in Canada's North: Benefits, challenges, and social impacts* (Conference Board of Canada, 2022). https://www.conferenceboard.ca/wp-content/uploads/woocommerce_uploads/reports/11538-impact-paper-fly-in-fly-out-labour.pdf

⁵⁷ BC First Nations Energy and Mining Council, *Indigenous Sovereignty: Consent for Mining on Indigenous Lands* (2022). https://fnemc.ca/wp-content/uploads/2022/01/FNEMC_mining_consent_FinalReport.pdf

⁵⁸ *Indigenous Sovereignty: Consent for Mining on Indigenous Lands*.

Spotlight: Northwest B.C.

The traditional territory of the Tahltan Nation overlaps with B.C.'s "Golden Triangle" — an area rich in critical minerals like copper.⁵⁹ In addition to the two active mines on the territory, Red Chris and Brucejack, nearly 41% of B.C.'s mineral exploration occurs on Tahltan lands.⁶⁰ Mining is a historic supplier of jobs in the region,⁶¹ with many employers having preferential hiring agreements with the nation. In 2023, the B.C. government entered into a consent-based decision-making agreement with the nation to guide the future operation of the Red Chris gold and copper mine.⁶²

The Tahltan Central Government developed a program to connect members with opportunities in the mining industry by offering labour market readiness supports. The OnTrack program offers tools such as a job board, a resume builder, and training and certification programs.⁶³ A key goal of the program is to help members identify and market the transferable skills they've developed through traditional activities, supporting them in securing jobs, accessing work-integrated learning opportunities, and discovering pathways for career advancement.

3.2.6 Takeaways for policymakers

Industry, government, local communities, and labour groups have worked together to pilot and deploy programs to remedy many of the above overlapping challenges. While there have been some successes, these programs lack the resources and scale to overcome the labour problems affecting the mining and critical minerals industries.

Without sufficient workforce planning or additional government interventions, the industry faces detrimental consequences where projects are delayed, become uneconomic, or never materialize at all.⁶⁴ Given global demand for critical minerals, Canada is poised to take on an increased profile, but risks falling short and relinquishing its position as a major global supplier of critical mineral products to places where these same labour challenges have been addressed.

⁵⁹ Jeff Desjardins, "Re-Awakening of the Golden Triangle," *Visual Capitalist*, April 6, 2017. <https://www.visualcapitalist.com/re-awakening-golden-triangle/>

⁶⁰ OnTrack, Tahltan Central Government, "Jobs in the Resource Industry." <https://ontrack.tahltan.org/about/mining/>

⁶¹ "Jobs in the Resource Industry."

⁶² B.C. Ministry of Environment and Parks, "Tahltan Nation, B.C. sign historic consent-based decision-making agreement," media release, November 1, 2023. <https://news.gov.bc.ca/releases/2023ENV0061-001707>

⁶³ OnTrack, Tahltan Central Government, "Discover your perfect career." <https://ontrack.tahltan.org/about/>

⁶⁴ United Steelworkers, "Submission to Canada's Critical Mineral Strategy," 2022. <https://usw.ca/wp-content/uploads/2022/09/2022-09-15-USW-Critical-Minerals-Submission-NRCAN-091522-Final.pdf>

4. Workforce development and critical minerals

In this section, we examine four government jurisdictions that have built strategies to grow the critical minerals industry: Canada, B.C., Alberta, and Ontario. Given that both public and private actors view labour market challenges as a major constraint, we assessed how government and multi-stakeholder initiatives have demonstrated leadership, highlighting their successes and shortcomings.

A recent report by the Battery Metals Association of Canada identified a skilled workforce as one of five essential criteria for developing a successful battery supply chain cluster. The report noted that regional attractiveness, local demographics, industrial history, and access to training centres all influence the industry's ability to attract workers.⁶⁵ These criteria can be applied across the entire critical minerals value chain.

4.1 Government-led initiatives

4.1.1 Government of Canada

In December 2022, the federal government released the Canadian Critical Minerals Strategy. A key pillar of the strategy is to grow a diverse workforce and prosperous communities. The strategy mentions leveraging six current federal workforce development programs to support this objective, including programs focused on green-skills building, youth outreach, and Indigenous training.⁶⁶ However, none of these programs have a specific focus on mining or critical minerals.

Since the strategy's release, Employment and Social Development Canada (ESDC) has funded the Mining Industry Human Resources Council (MiHR) to develop mining labour market information, train and certify workers, and provide them with wraparound supports.⁶⁷ ESDC has also invested over \$45 million through the Skills and Partnership Fund to three mining-related projects that could create over 400 jobs for Indigenous job seekers. Additionally, the federal government has established a federal, provincial and territorial task team to develop

⁶⁵ Sosthène Ung, *Towards a Western Canadian Battery Value Chain: Assessing industrial gaps and opportunities for economic development* (Battery Metals Association of Canada, The Transition Accelerator, Energy Futures Lab, 2025). https://www.bmacanada.org/wp-content/uploads/2025/06/BMAC_TA_EFL_Western_Canadian_Battery_Value_Chain-1.pdf

⁶⁶ Government of Canada, *The Canadian Critical Minerals Strategy* (2022), 31–32.

⁶⁷ “Canadian Critical Minerals Strategy Annual Report 2024.”

strategies on diversifying the mining workforce and attracting future talent, including launching social media campaigns and designing an interactive career map in collaboration with MiHR.

4.1.2 Government of British Columbia

The B.C. government is developing and implementing its critical minerals strategy in phases. Phase one, released in 2024, includes as a key action aligning training programs with the labour needs of the critical minerals sector under the Stronger BC: Future Ready Action Plan.⁶⁸ As part of the plan, the Ministry of Mines and Critical Minerals and the Ministry of Post-Secondary Education and Future Skills are to optimize workforce development initiatives for critical minerals. This effort is to include assessing existing programs to identify and address gaps and engaging with Indigenous peoples on their specific training needs. While there are few details on how these two ministries will meet this commitment, Stronger BC's future skills grant program lists mining as one of the priority sectors for the 2025/2026 fiscal year, providing up to \$3,500 for short-term skills training at public post-secondary institutions across the province.⁶⁹

The United Steelworkers are actively working with the Ministry of Post-Secondary Education and Future Skills to establish union-led training programs that are aligned with the needs of the mining industry for skilled workers. In addition, the United Steelworkers, as well as other labour unions, is a member of the Critical Minerals Advisory Committee, established by the government in January 2024 to guide the development of its Critical Minerals Strategy.⁷⁰ However, the committee has not met in over a year.

The B.C. Regional Energy and Resource Table — a framework for collaboration between the provincial and federal governments and the First Nations Leadership Council — has identified critical minerals as one of six opportunity areas to build a net-zero economy.⁷¹ The framework calls for a labour market plan in the short term to advance these priorities. It emphasizes that the plan should include “projections of British Columbia’s labour force in the medium to long term; an analysis of workforce availability and suitability; future opportunities, risks and

⁶⁸ B.C. Ministry of Energy, Mines and Low Carbon Innovation, “B.C. Grows Critical Minerals Sector, Sustainable Jobs,” media release, January 22, 2024. <https://news.gov.bc.ca/releases/2024PREM0003-000063>

⁶⁹ WorkBC, “StrongerBC Future Skills Grant.” <https://www.workbc.ca/find-loans-and-grants/students-and-adult-learners/strongerbc-future-skills-grant>

⁷⁰ B.C. Office of the Premier, “B.C. grows critical minerals sector, sustainable jobs,” media release, January 22, 2024. <https://news.gov.bc.ca/releases/2024PREM0003-000063>

⁷¹ Government of Canada, *British Columbia Regional Energy and Resource Table – Framework for Collaboration on the Path to Net-Zero* (2023). https://natural-resources.canada.ca/sites/nrcan/files/climate-change/BC-regional-table-collaboration-framework_2023-06.pdf

barriers; and participation of under-represented groups and Indigenous peoples.”⁷² No labour plan has yet been released.

In response to commitments in the framework, the Geological Survey of Canada and British Columbia Geological Survey collaborated to offer geoscience training on B.C.’s mineral deposits, as well as a course to advance understanding of First Nations archaeology and principles of ownership, control, access, and possession.⁷³ The BC First Nations Energy and Mining Council also received funding from Canada’s Indigenous Natural Resource Partnerships program to develop and deliver critical minerals literacy and First Nations training programs, as well as to develop a First Nations critical minerals strategy for their territories within B.C.

In 2023, the B.C. government granted funding to the B.C. Centre for Training Excellence in Mining for a skills road map project on how meet the mining sector’s future skills and training needs. The final report contained numerous recommendations targeting four strategic pillars: career and sector awareness; talent acquisition, retention and development; training access and delivery; and building capacity and understanding – labour market intelligence and research.⁷⁴ Specific recommendations included creating partnerships with K-12 schools; investing in expanding mentoring programs and networking groups; removing systemic barriers to training and skills development; providing funding for micro-skilling; and collecting data on successful equity, diversity, and inclusion programs.⁷⁵ While the road map is an important first step in meeting the anticipated workforce needs of the mining industry, much of it remains to be implemented.⁷⁶

4.1.3 Government of Alberta

The Alberta government has developed the Renewing Alberta’s Mineral Future strategy, an action plan to boost the province’s minerals sector. The strategy highlights several employment and training programs offered by the province: the Integrated Training Program, Immigrant Bridging Program, Self-Employment Program, Transition to Employment Services, Workplace

⁷² *British Columbia Regional Energy and Resource Table*, 27.

⁷³ Natural Resources Canada, *British Columbia Regional Energy and Resource Table – One-Year Progress Report* (2024). <https://natural-resources.canada.ca/climate-change/regional-energy-resource-tables/british-columbia-regional-energy-resource-table-one-year-progress-report>

⁷⁴ Centre of Training Excellence in Mining, *Skills Roadmap Project: Final report – Exploring how to meet the B.C. mining sector’s future skills and training needs* (2022). https://bc-ctem.ca/wp-content/uploads/CTEM_SRMP-Final-Report_Nov-30-2022.pdf

⁷⁵ *Skills Roadmap Project: Final report*.

⁷⁶ B.C. Ministry of Post-Secondary Education and Future Skills, “Skills Roadmap Helps People in the Mining Sector,” media release, January 20, 2023. <https://news.gov.bc.ca/releases/2023PSFS0005-000055>

Training Program and the Northern Alberta Development Council Bursary program.⁷⁷ However, none of these programs specifically target the critical minerals sector, representing a gap between Alberta’s stated objective to be a global leader in the sector and its strategy for achieving it.

The Alberta government did award funding through the Workforce Partnerships grants to the MiHR for the 2023–2024 fiscal year. This funding was for assessing labour market demand for critical mining occupations and investigating workforce attrition to develop targeted career initiatives in Alberta.⁷⁸ While a vital initial step, there has been no systematic follow-through or scalable solutions from the government to address the industry’s labour market needs.

Spotlight: Central Alberta

Alberta’s lithium industry represents an emerging opportunity as demand for the critical mineral rises. The province’s lithium occurs in deep underground brine formations, often in the same geological zone as oil and gas reservoirs. As technology has advanced, extracting lithium directly from this brine has become possible.⁷⁹ Producing lithium in this manner could be more efficient and have fewer environmental impacts than traditional hard-rock mining.⁸⁰ To meet growing demand, the federal and provincial governments have supported an extraction pilot by E3 Lithium, with production planned to begin in 2026. The pilot facility is expected to create 150 long-term jobs, while future plants in central Alberta could generate 500–1,000 over the next 10–15 years should the pilot prove successful.⁸¹

While the lithium industry still lacks dedicated workforce development initiatives, E3 has highlighted that Alberta’s workers in the oil and gas sector — particularly engineers and geologists — have transferable skills. In addition, extraction sites overlap.⁸² These alignments

⁷⁷ Government of Alberta, “Minerals strategy and action plan.” <https://www.alberta.ca/minerals-strategy-and-action-plan>

⁷⁸ Government of Alberta, “Workforce Partnerships Grants.” <https://www.alberta.ca/workforce-partnerships-grants#>

⁷⁹ Alberta Energy Regulator, “Emerging Resources – Lithium,” modified June 2024. <https://www.aer.ca/data-and-performance-reports/statistical-reports/alberta-energy-outlook-st98/emerging-resources/emerging-resources-lithium>

⁸⁰ Renjith Krishnan and Gokul Gopan, “A comprehensive review of lithium extraction: From historical perspectives to emerging technologies, storage, and environmental considerations,” *Cleaner Engineering and Technology* 20 (2024). <https://doi.org/10.1016/j.clet.2024.100749>

⁸¹ Doug Collie, “Pilot lithium plant could lead to 1,000 jobs in Central Alberta,” *St. Albert Gazette*, September 16, 2023. <https://www.stalbertgazette.com/beyond-local/pilot-lithium-plant-could-lead-to-1000-jobs-in-central-alberta-7556869#>

⁸² Amanda Stephenson, Canadian Press, “Alberta enters global critical minerals race with opening of first lithium extraction pilot project.” Available at *Financial Post*, September 7, 2023. <https://financialpost.com/commodities/mining/alberta-critical-minerals-lithium-extraction-pilot-project>

could be valuable as increasing automation and decreasing oil and gas demand may lead to job losses and career changes.

4.1.4 Government of Ontario

Ontario's Critical Minerals Strategy highlights the high turnover expected in production, technical, and skilled trades occupations in the mining sector.⁸³ The strategy includes high-level commitments to address labour shortages by attracting and training under-represented workers, promoting careers in mining, encouraging enrolment in mining-related programs, and identifying in-demand trades for funded apprenticeships.

To replace retiring workers and grow the workforce, the strategy focuses on two prime areas: leveraging immigration and supporting Indigenous participation in mining. It cites two current programs that help advance this goal.

The first program is the Ontario Immigrant Nominee Program, in partnership with the Government of Canada, which nominates foreign workers and international students for permanent residence based on the alignment of their skills with Ontario's labour needs. While this program is not specifically designed to support the mining industry, many of the workers selected in 2024 were in mining-related fields, including drillers and blasters, mining engineers, and mine supervisors.⁸⁴

The second program is the Indigenous Workplace Development Program. In 2021, the Ontario government provided the program with \$3.6 million to help train 150 Indigenous people for careers such as truck drivers, crane operators, welders and millwrights at the new Greenstone gold mine in Geraldton, northern Ontario.⁸⁵ Other programs such as Ontario's Skills Development Fund also offer funding for projects that address challenges to hiring, training or retaining workers across the entire economy, not just the critical minerals sector.⁸⁶

⁸³ Government of Ontario, *Ontario's Critical Minerals Strategy: Unlocking potential to drive economic recovery and prosperity, 2022–2027* (2022). <https://www.ontario.ca/files/2022-03/ndmnr-ontario-critical-minerals-strategy-2022-2027-en-2022-03-22.pdf>

⁸⁴ Ontario Ministry of Labour, Immigration, Training and Skills Development, "Archived – 2024 Ontario Immigrant Nominee Program Updates," January 6, 2025. <https://www.ontario.ca/page/2024-ontario-immigrant-nominee-program-updates>

⁸⁵ Government of Ontario, "Ontario Helping Indigenous People Start Careers in the Skilled Trades," media release, June 17, 2021. <https://news.ontario.ca/en/release/1000365/ontario-helping-indigenous-people-start-careers-in-the-skilled-trades>

⁸⁶ Government of Ontario, "Skills Development Fund Training Stream," modified August 7, 2025. <https://www.ontario.ca/page/skills-development-fund-training-stream>

The strategy commits to strengthening local employment and human resources planning by providing financial support to communities, sector groups, employers and industry associations, especially in Indigenous communities. As part of the strategy, the Government of Ontario committed to partnering with the Chiefs of Ontario to establish the First Nations Economic Growth and Prosperity Table — a collaborative forum to address shared economic priorities and challenges, with a focus on advancing First Nations financial self-sufficiency in sectors like energy, food sovereignty, and mining.⁸⁷ The Ontario government has allocated \$25 million over three years (2022–2025) through the joint table for First Nations economic development, including \$7.7 million to support training opportunities in communities and \$4 million to reduce financial barriers to Indigenous apprentices.⁸⁸

Spotlight: Northern Ontario

Northern Ontario is home to the Ring of Fire — the province’s most promising site for critical mineral development⁸⁹ — which lies within the traditional territories of many Treaty 9 First Nations. In 2013, the Ring of Fire Aboriginal Training Alliance, a partnership between industry, community organizations and educational institutions, received \$5.9 million from the federal government’s Skills and Partnerships Fund to train workers for mining.⁹⁰ It included pre-trade courses and training programs for roles like heavy equipment operator and environmental monitor.⁹¹ One of the partners is Kiikenomaga Kikenjigewen Employment & Training Services, which delivers skills and culturally appropriate job training for the Matawa First Nation to address high local unemployment.⁹² Initiatives like the alliance benefit both industry and First Nations.

⁸⁷ Chiefs of Ontario, “Priorities: Economic.” <https://chiefs-of-ontario.org/priorities/economic/>

⁸⁸ Chiefs of Ontario, “Ontario Regional Chief Glen Hare Welcomes \$25 Million Investment for First Nations Economic Development,” media release, October 19, 2022. <https://chiefs-of-ontario.org/ontario-regional-chief-glen-hare-welcomes-25-million-investment-for-first-nations-economic-development/>

⁸⁹ Government of Ontario, “Ontario’s Ring of Fire,” February 7, 2022. <https://www.ontario.ca/page/ontarios-ring-fire>

⁹⁰ Karen Kornelsen, “Ring of Fire Aboriginal Training Alliance receives \$5.9 million,” *Canadian Mining and Energy*, August 28, 2013. <https://www.miningandenergy.ca/read/ring-of-fire-aboriginal-training-alliance-receives-5-9-million>

⁹¹ Confederation College, “Ring of Fire Aboriginal Training Alliance (RoFATA) Prepares Matawa First Nations Members for Employment in Mining Sector.” Available at *CISION*, August 8, 2013. <https://www.newswire.ca/news-releases/ring-of-fire-aboriginal-training-alliance-rofata-prepares-matawa-first-nations-members-for-employment-in-mining-sector-512786121.html>

⁹² Kiikenomaga Kikenjigewen Employment & Training Services, “Kiikenomaga Kikenjigewen Employment & Training Services.” <https://www.kkets.ca/>

4.1.5 Comparisons across jurisdictions

Table 1 presents an overview of the different critical minerals strategies developed by the governments of Canada, B.C., Alberta, and Ontario. Following the table, we present our findings from comparing these jurisdictions' approaches.

Table 1. Summary of critical minerals strategy by jurisdiction

Jurisdiction	Critical minerals strategy	Workforce development commitment	Evidence of implementation
Canada	Canadian Critical Minerals Strategy (2022)	<ul style="list-style-type: none"> Develop initiatives to train and re-skill workers to meet critical minerals demand, with a focus on youth and diversity. Partner with various stakeholders to develop mineral literacy. Leverage Indigenous labour market programs to provide skills training and employment support. 	<ul style="list-style-type: none"> Funding the Mining Industry Human Resources Council to develop labour market information and train workers. Establishing a federal, provincial and territorial task team to develop strategies on diversifying mining workforce and attracting talent.
British Columbia	Phase 1: B.C.'s Critical Minerals Strategy (2024)	<ul style="list-style-type: none"> Optimize existing workforce development initiatives for critical minerals. Conduct a gap analysis of existing programs. Engage with Indigenous peoples on their unique training needs. 	<ul style="list-style-type: none"> Prioritizing mining under the BC's future skills grant program for 2025/26, covering up to \$3,500 for short-term skills training. Funding the B.C. Centre for Training Excellence in Mining to provide labour market outlooks and training programs in the mining industry.
Alberta	Renewing Alberta's Mineral Future (2021)	<ul style="list-style-type: none"> Develop a better understanding of the skill sets required by the minerals sector. Enhance minerals-focused webpages and outreach campaigns. Support skills development of workers transitioning from other sectors. Ensure public understanding of the differences between energy resource development and mineral exploration/development. 	<ul style="list-style-type: none"> Funding the Mining Industry Human Resources Council to assess labour market demand and attrition rates.

Jurisdiction	Critical minerals strategy	Workforce development commitment	Evidence of implementation
Ontario	Ontario's Critical Minerals Strategy (2022)	<ul style="list-style-type: none"> Promote careers and training in mining, especially to under-represented workers. Encourage enrolment in mining-related programs. Identify in-demand trades for funded apprenticeships. 	<ul style="list-style-type: none"> Prioritizing mining jobs under Ontario's Immigrant Nominee Program in 2024. Funding training in construction and mining through the Indigenous Workplace Development Program.

A consistent pattern emerged across all four governments regarding their approach to the critical minerals industry.

Each government recognized the strategic importance of the sector and consequently developed strategies with a range of tactics to harness its massive economic and employment potential. Moreover, all four strategies identified skills and labour market development as critical areas for intervention to ensure the industry's success. Despite this, none of the governments have developed plans and programs targeted specifically at overcoming the labour market challenges faced by the critical mineral industry. Instead, they are relying on existing workforce development programs that lack the industry focus or scalability to meaningfully address these challenges, summarized in section 3.

Addressing the labour market needs of the critical minerals sector should not be left to industry to manage alone. Concrete investments by government to achieve industry growth and meet unique regional labour market needs have precedent. The governments of Canada and B.C. have both supported initiatives led by non-profit human resources councils – the Mining Industry Human Resources Council and the B.C. Centre for Training Excellence in Mining – which are discussed in section 4.2.

4.2 Multi-stakeholder initiatives

4.2.1 Mining Industry Human Resources Council

The MiHR, a non-profit organization that leads collaboration between industry, labour, post-secondary institutions and Indigenous groups, plays a key role in addressing labour market challenges in the mining industry.⁹³ With funding from the Government of Canada, MiHR developed the Canadian Mining Skills Development Strategy to ensure that the mining workforce has the skills needed for the evolving industry. This strategy establishes and

⁹³ MiHR, "Skills Development and Recognition." <https://mihr.ca/cmsds/>

maintains industry standards for skills competencies and formally recognizes skills through initiatives in four key areas:

National Occupational Standards: The MiHR ensures that industry is aligned on the skills, training and knowledge required for seven critical mining-related occupations by establishing national occupation standards for each one, as well as competencies that apply to all the occupations (e.g., workplace policies and safety training). A National Occupational Standard Development Committee that consists of subject matter experts from industry, labour and education develops and reviews these standards and the associated training requirements every five years.⁹⁴

Training: Recognizing that industry-specific skills and competencies are not always covered by post-secondary programs, the MiHR offers nationally standardized, industry-validated training to reduce employers' training costs while equipping workers with the technical skills needed for success. The MiHR also offers professional development and upskilling opportunities through online, asynchronous courses and micro-learning, allowing workers to improve their skills without extended time away from work. Some of these learning initiatives promote more inclusive, safe and tolerant workplaces, covering topics such as gender equity in mining, Indigenous awareness, and anti-racism.⁹⁵

Work experience: The MiHR offers two work-integrated learning programs that support employers in hiring youth and providing them with industry experience. The MiHR's Gearing Up program gives employers a \$7,000 wage subsidy to hire students for co-op positions, internships, field placements or applied projects. The program currently supports 2,000 placements.⁹⁶ The MiHR's Green Jobs program focuses on low-carbon technology and innovation, offering 12-month paid work placements and training for youth. Employers receive a wage subsidy of up to \$24,000, or up to \$30,000 for Indigenous youth, youth with disabilities or youth living in northern and remote areas.⁹⁷

Recognition: The MiHR leads efforts to assess, align and recognize (1) company and educational training programs, and (2) worker skills, knowledge and experience against national standards. The council offers the Mining Training Recognition Program, which assesses the training programs of employers, educational institutions and training organizations to ensure that they are in line with industry needs and the National Training Occupational Standards.⁹⁸

⁹⁴ MiHR, "National Occupational Standards." <https://mihhr.ca/cmsds/national-occupational-standards/>

⁹⁵ MiHR, "eLearning." <https://mihhr.ca/cmsds/elearning/>

⁹⁶ MiHR, "Gearing Up." <https://mihhr.ca/career-development/gearing-up/>

⁹⁷ MiHR, "Green Jobs." <https://mihhr.ca/career-development/green-jobs/>

⁹⁸ MiHR, "The Canadian Mining Training Recognition Program." <https://mihhr.ca/cmsds/canadian-mining-training-recognition-program/>

These standards define learning outcomes and objectives to guide curriculum design and program development for high-quality training. The MiHR's Canadian Mining Certification Program provides workers whose skills and experience meet the National Occupational Standards nationally recognized certification.⁹⁹

4.2.2 Strengths of this approach

The programming offered by the MiHR under the Canadian Mining Skills Development Strategy establishes a strong training and development ecosystem and aids the mining industry's labour market efficiency. Ongoing collaboration to develop and revise occupation and training standards ensures a consistent and streamlined approach to recruiting and a workforce with up-to-date skills and knowledge.¹⁰⁰ The National Occupational Standards and National Occupational Training Standards also clearly set out for workers the skills and training they need to pursue a particular occupation or to move between mining jobs. In line with findings in the Pembina Institute's *Recruit, Train, Retain* report, the MiHR's programs are successful because they convene stakeholders to share knowledge while leveraging both government and private funding.¹⁰¹ Through MiHR work experience programs, they also align with our recommendations to focus on youth recruitment, especially in underserved groups and areas, and to cover multiple areas of workforce development, including education and training, career development, and recruitment and retention.

The recognition of certifications and programs helps the sector by removing the administrative burden placed on employers to determine the validity of credentials and training. This is important given that the sector is highly mobile, and many workers live in a different province than the one they work in. MiHR certification assures employers that a worker has the skills and training to work in the sector regardless of the location of the work site.

Training and education offerings that foster psychologically safe workplaces and promote culture shifts toward greater equity, diversity and inclusion are vital to improving the job-site experiences of women and other equity-deserving groups, promoting retention. However, these courses are offered on a voluntary basis, and there is no evidence of broad-based adoption among workers in the mining industry.

⁹⁹ MiHR, "The Canadian Mining Certification Program (CMCP)." <https://mihr.ca/cmsds/the-canadian-mining-certification-program/>

¹⁰⁰ OECD, "Agile Occupational and Training Standards for Responsive Skills Policies," December 3, 2024. https://www.oecd.org/en/publications/agile-occupational-and-training-standards-for-responsive-skills-policies_bacb5e4a-en.html

¹⁰¹ Megan Gordon, *Recruit, Train, Retain: Fostering low-carbon industries through regional workforce planning* (Pembina Institute, 2025), 22. <https://www.pembina.org/pub/recruit-train-retain>

Lastly, access to high-quality labour market data is crucial to effective workforce planning and training development, and the labour market information underpinning the Canadian Mining Skills Development Strategy is a prime example of this. It equips employers with essential information and tools to advance the workforce, while also highlighting job opportunities for workers.

All together, the MiHR's programs and initiatives support the industry to build a growing and successful workforce over the long term.

4.2.3 Centre of Training Excellence in Mining

Based at Coast Mountain College in Terrace, B.C., the Centre for Training and Mining Excellence (CTEM) collaborates with industry, post-secondary institutions and Indigenous and local communities to develop training and pilot projects for mineral exploration, development and extraction.¹⁰² It receives funding from the B.C. Ministry of Advanced Education, Skills and Training, as well as industry grants, and serves as a virtual hub to facilitate collaboration among partners and connect job seekers to training and employment opportunities.

CTEM is focused on understanding the dynamic skills requirements of the mining industry, facilitating skills training and development in all regions of the province (i.e., urban, rural and remote) and undertaking collaborative projects such as the following labour market studies and workforce development initiatives:¹⁰³

- Skills Road Map Project — CTEM identified future skills and training needs and set out a strategy to meet them, drawing on labour market information to create skills, career and training road maps.
- Underground Miner Training Project — With several new approved mines on the horizon, the demand for underground miners is projected to increase. CTEM developed a standard curriculum aligned with a national occupational standard for underground miners that is delivered locally or on-site and provides a nationally recognized certificate.
- B.C.'s Mining Labour Market Outlook — Funded through the Canada–British Columbia Labour Market Development Agreement and the Sectoral Initiatives Program, CTEM developed a ten-year labour market analysis and forecast for B.C.'s mining industry. The centre assessed industry trends and consulted stakeholders to predict labour market challenges and opportunities and recommend how to respond to them.

¹⁰² Centre of Training Excellence in Mining, “About Us.” <https://ctem.wpengine.com/about-us/>

¹⁰³ Information on each project, including final reports, is available at <https://bc-ctem.ca/projects/>.

4.3 Main findings

Across Canada, workforce development planning for the critical minerals sector remains underdeveloped.

While the MiHR offers detailed labour market analysis and programming to address workforce challenges in the upstream sector, there is no equivalent analysis for mid- and downstream sectors across the critical minerals supply chain. Additional research is needed to better assess the specific barriers and opportunities to support the workforce in the mid- and downstream sectors, accompanied with industrial strategies to boost the growth of these sectors.

Other organizations are helping fill gaps through programs that align training to industry needs, support inclusive recruitment, and provide sector-wide labour market insights. The MiHR's programs partly address the need for strong labour market information, stakeholder collaboration, and programming that addresses the multiple dimensions of workforce development. Federal leadership, however, is needed to coordinate efforts across jurisdictions and ensure that new industrial strategies are backed by timely, inclusive, and well-resourced workforce initiatives.

4.3.1.1 Canada

While the Canadian Critical Minerals Strategy identified workforce diversity and community prosperity as key objectives, there are currently no industry-aligned or sector-specific programs that support them. This gap highlights a disconnect between the critical minerals sector's growth potential and the policy tools available to support labour force development.

4.3.1.2 British Columbia

B.C.'s approach is significant because of its high degree of multi-stakeholder partnerships. By bringing together industry, post-secondary institutions, labour, and Indigenous groups to provide input on initiatives like CTEM, the government has been able to ensure alignment between the skills developed in training programs and those demanded by industry. Moreover, because CTEM receives funding from a combination of government ministries and industry sources, the centre has also achieved a high level of industry buy-in.

Through these collaborations, B.C. has been able to acquire high-quality labour market information and forecasts to help workers and students identify employment opportunities and cultivate the relevant skills. This aligns with our findings in *Recruit, Train, Retain* that governments can be most effective by strategically contributing to multi-stakeholder projects,

strengthening the quality of labour market information, and targeting multiple areas of workforce development.¹⁰⁴

B.C. has shown leadership in convening stakeholders to efficiently identify policy gaps, weaknesses in existing programs, and other areas of need, especially in job training. Other jurisdictions can also learn from forward-thinking Indigenous-led programs like the Tahltan Nation's OnTrack initiative, which has helped connect their members to job opportunities while fostering skills developed through traditional practices.

4.3.1.3 Alberta

Although Alberta recently released a minerals strategy to grow its nascent critical minerals industry, the government has not yet implemented any sector-specific workforce programs.

The province has ample growth potential due to untapped critical mineral resources and a workforce with transferable skills suited to lithium extraction from brine. By assessing the strengths of its current workforce and investing in projects that leverage their skills, Alberta (as well as other jurisdictions) can be strategic. Direct brine extraction could also produce magnesium, potash and rare earth elements,¹⁰⁵ the latter supported by an emerging processing industry in Saskatchewan.¹⁰⁶

Developing labour market information is important to assess where job opportunities will emerge and determine the training and support workers will need.¹⁰⁷ The awarding of a Workforce Partnership grant to MiHR to do this work is a promising first step, but government-led labour market interventions should be further developed in collaboration with industry, organized labour, and post-secondary institutions.

4.3.1.4 Ontario

Ontario has identified immigrants as a key demographic for mining workforce growth, and made it a priority to better accommodate this under-represented demographic. By partnering with the Government of Canada, the province is not only able to secure another funding stream,

¹⁰⁴ *Recruit, Train, Retain.*

¹⁰⁵ Government of Alberta, *Alberta's Critical Minerals Potential (2023)*. <https://open.alberta.ca/dataset/421d532a-c8f6-4a00-b34e-7ad04078621e/resource/f6901a6e-88a0-4acb-aa71-175a69c4c14b/download/enr-albertas-critical-minerals-potential-2023.pdf>

¹⁰⁶ Saskatchewan Research Council, "Saskatchewan to create Canada's first rare earth processing facility at SRC," media release, August 27, 2020. <https://www.saskatchewan.ca/government/news-and-media/2020/august/27/ree-facility>

¹⁰⁷ *Recruit, Train, Retain.*

but is also able to offer immigrants in mining tangible benefits like an expedited path to permanent residency.

Similarly, the province has identified Indigenous people as another growth demographic and has taken steps to establish partnerships with Indigenous groups whose lands house many mining claims, which is critical for supporting Indigenous sovereignty. Industry has also directly partnered with Indigenous nations to deliver culturally sensitive training. This is especially important since Indigenous people often face discrimination on site.¹⁰⁸

The Ontario government has also provided funding for apprenticeship retention programs, vital for an industry viewed as one of the least preferred by young people.¹⁰⁹

The overall number of programs promoting workforce development in mining, however, is still limited.

Recognizing international recruitment and improving new immigrants' socioeconomic outcomes, taking a strategic approach to public funding, and using industrial strategy to drive regional workforce development are all crucial, as we highlighted in *Recruit, Train, Retain*. Other jurisdictions can follow Ontario's example by building strong First Nations and federal government partnerships, funding multi-stakeholder training initiatives, and investing in programs that will make mining a safe and attractive path for apprentices.

¹⁰⁸ *Fly-In, Fly-Out Labour in Canada's North: Benefits, challenges, and social impacts.*

¹⁰⁹ *Perceptions and Interest in a Mining Sector Career.*

5. Conclusion

Canada's workforce development policy for the critical minerals sector is still emerging, mirroring the sector's own growth and rising prominence.

Across the four jurisdictions surveyed in this report, most policies focused on attracting new labour, often from equity-seeking groups; building foundational skills; and providing labour market information. While these measures may help boost the size of the workforce, they fall short on retention. They also do little to address pressing mental health and equity issues, where progress has been slow. Further research on effective interventions is needed.

A cross-cutting lesson from B.C., Alberta, and Ontario is that workforce development in the critical minerals sector benefits most from a collaborative approach — one that includes governments at all levels, Indigenous nations, post-secondary institutions, labour groups, and employers. B.C.'s model of sustained multi-stakeholder engagement and regional coordination through CTEM stands out as a replicable approach. Similarly, Ontario's efforts to better integrate immigrants and Indigenous communities into the mining workforce demonstrate the value of proactive, inclusive programming that aligns federally and provincially.

Despite these promising initiatives, many workforce interventions remain piecemeal and underfunded. National coordination remains limited, and the industry continues to face systemic barriers that hinder progress — from persistent gender and racial inequities to geographic challenges associated with working in remote and northern regions. These structural issues require targeted solutions that go beyond labour market forecasting to address the lived experiences of workers and promote retention, safety and long-term career development.

Effective workforce planning must be a central pillar of Canada's nation-building efforts. Growing the critical minerals sector is not simply a matter of extraction and processing — it is also a test of whether Canada can ensure that the benefits of this growth are equitably distributed. Without a trained and supported workforce, the sector risks stalling, and the broader goals of energy sovereignty, economic security, and climate action could fall short.

By acting now to develop a strategy that places workers at the centre of critical minerals development, policy-makers can address not only immediate labour shortages but also lay the foundation for resilient, inclusive, and sustainable employment for generations to come.



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