

MADE FOR NUCLEAR

WORKFORCE DEVELOPMENT STRATEGY

This project was overseen by a dedicated Steering Committee.



The Province of Alberta is working in partnership with the Government of Canada to provide employment support programs and services.

Canada 

Alberta 

Table of Contents

Executive Summary	iii
1. Introduction	1
1.1 Status of Nuclear in Canada	1
1.2. Workforce Overview	2
1.3. Gap Analysis	2
2. Strategy Basis	5
2.1. Challenges Facing the Industry	5
3. The MADE for Nuclear Strategy Pillars	6
3.1. Strategic Pillars	6
3.2. Strategic Initiatives	10
3.2.1. Strategic Pillar 1: Mobility (Provincial and Sectoral) Initiatives	12
3.2.2. Strategic Pillar 2: Attraction and Retention Initiatives	15
3.2.3. Strategic Pillar 3: Diversity, Equity and Inclusion Initiatives (I)	18
3.2.4. Strategic Pillar 3: Diversity, Equity and Inclusion Initiatives (II)	20
3.2.5. Strategic Pillar 4: Education and Skills Alignment Initiatives (I)	22
3.2.6. Strategic Pillar 4: Education and Skills Alignment Initiatives (II)	24
4. Additional Considerations for New-to-Nuclear Jurisdictions	27
4.1. Workforce Planning	27
4.2. Recruitment	28
4.3. Education, Training and Development	29
4.4. Remuneration, Benefits and Retention	30
4.5. Stakeholder Engagement	31
5. Conclusions	32
Appendix A : Overview of Core Roles in Nuclear	33

List of Tables

Table 1: Top 25 NOC codes/professions that are likely to experience the highest shortages	3
Table 2: Detailed description of the MADE for Nuclear strategic priorities	7

List of Figures

Figure 1: Overview of the strategic pillars for the nuclear sector’s workforce development	iv
Figure 2: Total gap in workers nationally across time for planned and signalled projects and the 50GW by 2050 scenario.....	3
Figure 3: MADE for Nuclear workforce strategy pillars	6
Figure 4. Roadmap of Strategic Pillars	11
Figure 5: Elements of the IAEA’s HRM Strategy for new nuclear programs	27
Figure 6. Recruitment Sourcing and Staffing Lifecycle	28
Figure 7: Durations of Typical Onboarding and Training Programs.....	30

Executive Summary

After evaluating workforce demand for new nuclear buildout in Canada¹, this report outlines a strategy to leverage available skills and build a talent pipeline for planned and signalled projects nationwide.

The Canadian nuclear workforce is expected to start experiencing shortages from 2030 as new nuclear buildout continues in Ontario, Saskatchewan, New Brunswick and Alberta. About 25% of core technical workers will reach retirement age in the next five years, putting the continuity of buildout and operations at risk in the skilled trades, engineering and other technical functions. At the same time, planned and signalled projects across Canada are set to place pressure on the existing workforce. In a different light, these projects are set to create jobs in Canada, at a time when economic uncertainty is high. The data in the accompanying data report show that these projects will increase jobs in the skilled trades, specialized engineering degrees and support functions if the right mix of policies and initiatives are implemented to support the buildout of new projects.

Canada's workforce faces many challenges, including:

- An aging workforce with over 25% of those employed in nuclear reaching retirement age by 2030-2035.
- Global competition for nuclear skills amid the ambition by many countries to increase nuclear capacity.
- Shortages of skilled trades professionals, many of whom are crucial to the buildout of nuclear energy, are expected to begin from 2030.
- Evolving technology such as small modular reactors, digital twins, data centers and AI-driven innovations that will require novel skillsets.

Canada's training systems, credentialing processes, and labour mobility structures are not keeping pace with the impending shortages. Gaps are especially acute in skilled trades and technical leadership. Participation also remains low among women, Indigenous peoples, youth, and newcomers, further compounding the talent shortfall. Without urgent and coordinated action, these pressures will delay projects, drive up costs, and weaken Canada's ability to compete and lead in the next generation of nuclear development.

The Canadian Nuclear Association has conducted a workforce needs assessment and found the need for a workforce strategy driven by a whole-of-ecosystem approach. The resulting strategy – **MADE for Nuclear** - aims to build a modern, mobile, and inclusive workforce that allows Canada to capitalize on a once-in-a-generation opportunity to lead in the buildout of clean, reliable nuclear energy through to 2050, spur regional economic development and provide jobs for the next generation. To meet this challenge, Canada must transform its talent systems, from outreach and education to mobility and diversity, to deliver a workforce that can support the scale and complexity of Canada's nuclear build-out to 2050.

¹ See CNA Projecting the Nuclear Workforce Demand report

This MADE for Nuclear strategy is based on four pillars: Mobility; Attraction and Retention; Diversity, Equity, and Inclusion; and Education, Skills, and Training.

	Mobility	Attraction and Retention	Diversity, Equity and Inclusion	Education and Skills Alignment
Description	Create mechanisms to move qualified professionals and new entrants swiftly to where projects need them. Enable entry of trades, professionals and displaced workers to enter the workforce.	Create a national campaign to increase awareness, accessibility, and desirability of careers in the nuclear sector, particularly in the skilled trades and hard-to-fill technical roles	Ensure that the nuclear workforce reflects Canada's population diversity by including Indigenous Peoples, women, people with disabilities, and members of visible minority groups	Ensure Canada's pre- and post-secondary education, apprenticeship trainings and trainings for transitioning workers are aligned with nuclear sector needs and meet regional requirements.
Desired Outcomes	<p>Workforce agility: reduces hiring friction by unlocking talent across Canada, and in adjacent industries to enable rapid scale-up of buildout.</p> <p>Efficiency: Increases system-wide visibility of supply and demand, allowing efficient deployment of labour across regions and project phases.</p>	<p>Addresses critical visibility and reputational barriers that limit the sector's ability to attract new talent, particularly in the skilled trades and in early career roles.</p> <p>Retention strategies will position the sector as a stable future-focused career path.</p>	<p>Removes barriers to entry for qualified equity groups in the population.</p> <p>Improves reflection of the Canadian population. Increases the availability of talent, ideas and innovation in leadership roles, mid-, and early careers.</p>	<p>Talent readiness: Ensures graduates and new apprentices are equipped with the technical, regulatory, and cultural competencies required for modern nuclear roles.</p> <p>Responsive and agile education systems that can be scaled as needed to meet project and regional needs.</p>

Figure 1: Overview of the strategic pillars for the nuclear sector's workforce development

These four pillars, if well implemented, will be the foundation of a coordinated national effort to build a resilient, inclusive, and future-ready nuclear workforce that can deliver on Canada's clean energy ambitions through 2050 and beyond.

1. Introduction

1.1 Status of Nuclear in Canada

Canada's nuclear sector is entering a phase of focused renewal and expansion, driven by its role in achieving national decarbonization objectives, regional energy reliability, and long-term economic growth. The sector is anchored by the long-term operation and refurbishment of the existing CANDU reactor fleet, alongside strategic investment in next-generation technologies and research capacity.

The foundation of Canada's nuclear sector remains the fleet of CANDU reactors, located in Ontario and New Brunswick. The current fleet is being revitalized through extensive refurbishment programs. Bruce Power and Ontario Power Generation are collectively investing \$26B over more than 15 years to extend the lifespans of the plants, thus creating tens of thousands of jobs². In addition, new nuclear developments at Bruce Power's site C and at OPG's Darlington sites are projected to create approximately 38,000 jobs annually during construction and support an average of 15,000 jobs nationwide over their lifetimes³. OPG has also initiated plans to build up to 10,000 MW of new nuclear at its Wesleyville site, which will create even more job roles.

Canada is also at the forefront of Small Modular Reactor (SMR) development and deployment, with OPG selecting the BWRX-300 as the country's first grid-scale SMR to be located at the Darlington site. Beyond Ontario, provinces such as Saskatchewan, New Brunswick, and Alberta are actively exploring SMRs and potentially large reactor technologies as part of their strategies to phase out fossil fuel generation, support industrial decarbonization, and enhance grid resilience. In Saskatchewan, the First Energy Security Strategy and Supply Plan, published in 2025, outlines the province's commitment to a reliable and affordable energy future, with uranium as the key to powering it. In Alberta, consultations are underway as part of the initial stages of new nuclear deployment, and the Government of New Brunswick's Path to 2035 strategy highlights the need for an additional 600 MW of new nuclear.

Sustained investment in research and innovation is also crucial to the sector's success. The federal government has committed significant funds to modernize the Canadian Nuclear Laboratories (CNL) at Chalk River, enabling the lab to play a leading role in the development of next-generation reactor technologies, fuel cycle research, and the use of nuclear to produce green hydrogen and industrial heat. Beyond the national laboratory, existing facilities in Ontario are set up to support new nuclear development. In new-to-nuclear jurisdictions like Saskatchewan, where new nuclear development is steadily advancing, funding announcements have been made to support the development of an SMR testing, safety and licensing facility at the University of Regina.

Ontario, Saskatchewan, New Brunswick, and Alberta have 22.3 GW of new nuclear projects planned or signalled, not including micro-reactor demonstrations. These projects' success depends on government

² Bruce Power (2025). [Bruce Power completes most successful defuel in CANDU history as workforce continues to excel in Unit 4 MCR project and Life-Extension program - Bruce Power](#)

³ Bruce Power (2025). [Bruce Power's Bruce C Project would be a cornerstone of Canada's energy independence and drive the economy - Bruce Power](#)

coordination, sector innovation, and comprehensive workforce strategies.

1.2. Workforce Overview

The Canadian nuclear workforce is predominantly engaged in roles tied to CANDU reactor operations, life-extension projects, and associated refurbishments. The Darlington, Pickering, and Bruce Power sites are the primary hubs, supported by smaller operations in New Brunswick and emerging activity in Saskatchewan and Alberta linked to early-stage nuclear energy planning. The workforce spans a wide spectrum of roles, including engineering, skilled trades, reactor operations, project management, and regulatory affairs.

Canada's nuclear workforce is comparatively younger than some international peers, with 44% aged 40 or under⁴. However, retirement-driven attrition remains a critical near-term challenge, especially given the long lead times required to train and license new entrants in specialized roles. Conservative estimates suggest that between 20–31% of the electricity workforce will reach retirement age in the next five years⁵, placing pressure on continuity in areas such as engineering design, maintenance, and control systems.

Furthermore, the sector is experiencing a transformation, driven by the integration of AI, digitization, and automated systems across reactor operations, construction, decommissioning, and regulatory oversight. These changes are redefining role requirements and expanding demand for hybrid skill sets that combine traditional nuclear knowledge with competencies in data science, cybersecurity, and smart infrastructure management.

Delivering on Canada's nuclear ambitions will require a workforce system that can scale efficiently, adapt to new technologies, and respond to shifting labour demands over time. As the sector looks to build more, and as deployment of nuclear technologies across the country evolves from traditional CANDU reactors to include SMRs and advanced digital systems, the workforce must grow in size and capability. Meeting this demand will require sustained collaboration across industry, government, and academia to expand technical education, enable career transitions, and support mobility across regions and roles.

1.3. Gap Analysis

An assessment of the total gaps in the nuclear sector workforce was based on two scenarios: planned and signalled projects across Canada that add up to 22.3 GW of new nuclear, and the need for 50 GW of new baseload power (Figure 2). The analyses also show the top 25 professions that are likely to experience the most significant shortages based on the planned and signalled projects (Table 1).

⁴ CNA (2024). [Canadian Nuclear Industry: A Powerhouse of Job Creation and Economic Growth | Canadian Nuclear Association](#). Last accessed on 13 November 2025.

⁵ Centre for Energy Workforce Development (2021). 2021 Pipeline Survey Results. [Gaps-In-Energy-Careers-Report-2022_Final-pages.pdf](#). Last accessed on 13 November 2025.

Based on the results, shortages are expected to be severe in the skilled trades and in specialized engineering degrees. This was confirmed through an analysis of shortages by TEER classes, which confirmed that TEER 2 and TEER 1 professions, which refer to occupations that require apprenticeship training and occupations that require a university degree, respectively, were likely to show the highest shortages.

For a more detailed report on the data analysis, please refer to the CNA’s “Projecting the Future Canadian Nuclear Workforce” report, which was released alongside this strategy report.

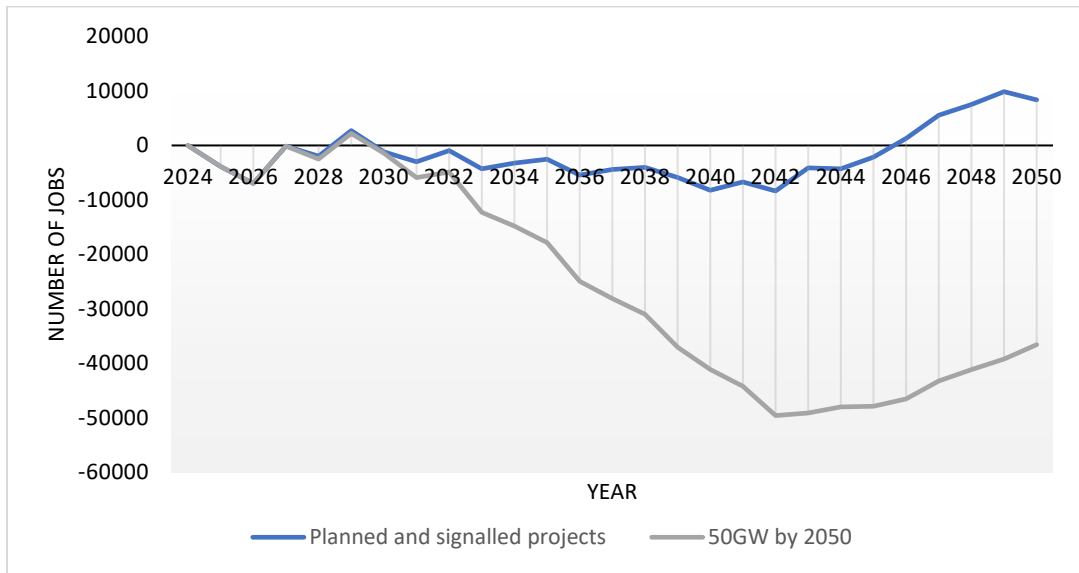


Figure 2: Total gap in workers nationally across time for planned and signalled projects and the 50GW by 2050 scenario.

In addition to data analysis, the strategy presented in this report was informed by surveys and interviews conducted to understand the state of the workforce and future needs.

Table 1: Top 25 NOC codes/professions that are likely to experience the highest shortages

NOC code	Job Title	Average Yearly Gap (2024-2050)	Median Yearly Gap (2024-2050)
72105	Ironworkers	-1249	-1290
75119	Other trades helpers and labourers	-1072	-1116
72301	Steamfitters, pipefitters, and sprinkler system installers	-726	-616
21301	Mechanical engineers	-573	-458
72201	Industrial electricians	-566	-543
20010	Engineering managers	-441	-472
22100	Chemical technologists and technicians	-433	-398
70010	Construction managers	-351	-366
92100	Power engineers and power systems operators	-224	-13

72102	Sheet metal workers	-218	-225
64410	Security guards and related security service occupations	-187	-85
22221	User support technicians	-175	-180
70012	Facility operation and maintenance managers	-158	-150
21300	Civil engineers	-156	-165
21310	Electrical and electronics engineers	-147	-151
22303	Construction estimators	-108	-122
73400	Heavy equipment operators	-107	-114
73300	Transport truck drivers	-102	-109
42101	Firefighters	-88	-84
22233	Construction inspectors	-86	-89
74204	Utility maintenance workers	-75	-81
22301	Mechanical engineering technologists and technicians	-68	-58
65312	Janitors, caretakers, and heavy-duty cleaners	-67	-69
22310	Electrical and electronics engineering technologists and technicians	-60	-66
22300	Civil engineering technologists and technicians	-58	-62

2. Strategy Basis

This strategy lays out a clear roadmap to guide the talent transformation. The objectives of this strategy are two-fold:

1. To drive private sector action by identifying areas where industry must lead workforce development.
2. To identify key opportunities for the entire nuclear ecosystem – industry, academia, governments, communities, etc. - to act upon to drive workforce growth and sustainability, and guide collective effort across industry, education, and government.

2.1. Challenges Facing the Industry

Based on stakeholder engagement across the sector to understand the challenges impacting the attraction and retention of talent, four key themes emerged:

- a) **Low public awareness of nuclear careers:** Limited public outreach, few visible role models, and weak connections between the sector and the education system contribute to a lack of awareness of nuclear sector careers, particularly outside Ontario. Career paths are poorly defined, job roles are not widely understood, and the sector's image remains outdated. This limits entry into the field and reduces engagement from youth, educators, and career influencers.
- b) **Misalignment between education pathways and workforce needs:** Training systems are not equipped to deliver the specialized, job-ready talent the sector requires. Nuclear-specific programs are limited, apprenticeship spots are scarce, and education timelines often fail to align with project delivery needs. Engineers graduate with insufficient practical experience, trades face bottlenecks in access to training, and reskilling pathways for emerging roles are underdeveloped. Retention programs are also lacking, undermining workforce continuity during a period of rapid expansion.
- c) **Barriers to skilled worker transition from other sectors or regions:** Canada is underutilizing experienced talent from adjacent sectors and other regions due to fragmented credentialing, inconsistent recognition of prior experience, and limited mobility support. Interprovincial labour flows are constrained by regulatory barriers and infrastructure gaps, particularly in emerging jurisdictions like Alberta and Saskatchewan. These barriers limit flexibility, delay project staffing, and contribute to regional disparities in workforce readiness.
- d) **Narrow talent pipelines lacking demographic and experiential diversity:** The nuclear workforce does not reflect the diversity of Canada's population. Women, Indigenous peoples, newcomers, and racialized communities face persistent barriers to entry, including systemic bias in hiring, relocation costs, and other challenges. A lack of inclusive pathways and support structures discourages participation. In many organizations, diversity and inclusion efforts remain under-

resourced or sidelined in favour of short-term hiring pressures. Overall, sector-wide coordination is limited and efforts to grow and diversify the workforce are often siloed, thereby reducing their impact.

3. The MADE for Nuclear Strategy Pillars

3.1. Strategic Pillars

In light of the identified structural and cultural challenges, four strategic pillars have been identified to guide the nuclear ecosystem’s approach to addressing workforce needs.

	Mobility	Attraction and Retention	Diversity, Equity and Inclusion	Education and Skills Alignment
Description	Create mechanisms to move qualified professionals and new entrants swiftly to where projects need them. Enable entry of trades, professionals and displaced workers to enter the workforce.	Create a national campaign to increase awareness, accessibility, and desirability of careers in the nuclear sector, particularly in the skilled trades and hard-to-fill technical roles	Ensure that the nuclear workforce reflects Canada’s population diversity by including Indigenous Peoples, women, people with disabilities, and members of visible minority groups	Ensure Canada’s pre- and post-secondary education, apprenticeship trainings and trainings for transitioning workers are aligned with nuclear sector needs and meet regional requirements.
Desired Outcomes	<p>Workforce agility: reduces hiring friction by unlocking talent across Canada, and in adjacent industries to enable rapid scale-up of buildout.</p> <p>Efficiency: Increases system-wide visibility of supply and demand, allowing efficient deployment of labour across regions and project phases.</p>	<p>Addresses critical visibility and reputational barriers that limit the sector’s ability to attract new talent, particularly in the skilled trades and in early career roles.</p> <p>Retention strategies will position the sector as a stable future-focused career path.</p>	<p>Removes barriers to entry for qualified equity groups in the population.</p> <p>Improves reflection of the Canadian population. Increases the availability of talent, ideas and innovation in leadership roles, mid-, and early careers.</p>	<p>Talent readiness: Ensures graduates and new apprentices are equipped with the technical, regulatory, and cultural competencies required for modern nuclear roles.</p> <p>Responsive and agile education systems that can be scaled as needed to meet project and regional needs.</p>

Figure 3: MADE for Nuclear workforce strategy pillars

Table 2: Detailed description of the MADE for Nuclear strategic priorities

Pillar	Description	Why it matters
Mobility	<p>Enable smooth movement of workers across regions and sectors through improved credential recognition across the provinces and territories, as well as transition support for workers from other sectors. This pillar enhances workforce agility and efficiency by reducing hiring friction, unlocking cross-sector talent, and improving labour deployment across project timelines and geographies.</p>	<p>Barriers such as inconsistent licensing, limited inter-provincial credential recognition, and regional silos make it difficult for skilled workers to respond to opportunities in the nuclear sector. These challenges are especially significant in jurisdictions without existing nuclear projects or regulatory familiarity, where importing talent or transitioning workers from other industries is essential. Specifically, engineers must be licensed by the provinces, and provinces vary in their required length (hours) for apprenticeships as part of the certification process for tradespersons, which could impact the mobility of apprentices⁶.</p> <p>The recent announcement of Bill C-5 offers a timely federal framework to address interprovincial labour mobility and streamline credential recognition. Building on this, the sector must develop nationally coordinated but regionally tailored approaches, including credential databases, mobile training programs, and clear pathways for workers from adjacent sectors. In Ontario, the priority is redeployment within an experienced workforce. In provinces like Alberta and Saskatchewan, the focus should be on enabling entry through cross-sector recruitment and training. By reducing friction and unlocking access to skilled labour across Canada, this pillar supports the timely delivery of nuclear projects.</p>
Attraction and retention	<p>Grow and sustain the talent pipeline by raising awareness of nuclear careers, improving public perception, and strengthening worker engagement. Similar to allied countries like the UK and France,</p>	<p>Attraction and retention are key to building a resilient nuclear workforce that can support Canada’s clean energy ambitions to 2050. The sector will need to adopt a coordinated, national approach to outreach and engagement that reflects regional realities and evolving</p>

⁶ <https://www.ellischart.ca/eng/search/s.2.1rch.shtml>

	<p>where national campaigns have been employed to attract new talent for new nuclear energy buildout, Canada requires a whole-of-ecosystem national campaign that will help the sector overcome visibility and reputational barriers to attract new talent and position nuclear as a stable and future-focused career to support long-term retention.</p>	<p>workforce expectations. In Ontario, the focus must be on knowledge transfer and engagement of an experienced, retiring workforce. In emerging jurisdictions like Alberta and Saskatchewan, the priority is to build awareness from the ground up, especially among youth, trades, and underrepresented communities. Retention strategies must also reflect generational shifts that reflect the values of today’s workers. By addressing these needs, this pillar expands and sustains the talent pipeline for the nuclear industry's growth.</p>
<p>Diversity, equity, and inclusion</p>	<p>Broaden workforce participation by removing barriers and creating inclusive, culturally safe pathways into the sector. This pillar improves access for equity-deserving groups and strengthens representation across all levels of the workforce. Canada is a signatory to the Equal by 30 campaign – an initiative aimed at accelerating gender equality and diversity in clean energy transitions and closing the gender gap in non-emitting energy sectors by 2030. In addition to fulfilling this obligation, building a workforce that reflects a true representation of the country’s population, supporting the entry of Indigenous Peoples, visible minorities, and other less-represented groups will be a boost to the sector.</p>	<p>In many communities near proposed nuclear projects, limited access to training and a lack of exposure to career pathways constrain participation and reduce local benefit. Additional barriers, such as relocation costs, misaligned credential recognition, and exclusionary hiring practices, further limit entry and advancement. To close these gaps, the sector must build inclusion into every stage of the workforce pipeline. That includes increasing access to training in underserved regions, supporting Indigenous and community-led education initiatives, and enabling flexible work models that reduce geographic and social barriers. Partnerships with local institutions, targeted recruitment strategies, and leadership development programs for underrepresented groups can help shift perceptions of possibilities in nuclear careers. By aligning these efforts with workforce planning, the sector can broaden its talent pool, build community trust, and ensure the benefits of nuclear development are more widely shared</p>
<p>Education and Skills Alignment</p>	<p>Align training and education systems with sector needs to ensure timely access to job-ready, skilled talent. This pillar supports graduate readiness for nuclear roles and creates responsive education pathways that adapt to evolving technologies, timelines, and regional demands. It also highlights the need for training programs for transitioning</p>	<p>While workforce needs are accelerating, training systems are lagging as nuclear-specific programs are limited, practical experience is inconsistent, and emerging roles outpace curriculum updates. These gaps create bottlenecks that threaten project timelines and regional readiness, particularly in provinces building capacity from the ground up.</p>

professionals who may already have skills for the nuclear sector and require relatively minimal training to meet project needs and regional requirements.

To address this issue, Canada must adopt a coordinated approach that reflects regional priorities and industry needs. Strengthening the connection between training systems and workforce demand will be critical to building a pipeline of talent that is ready, distributed, and prepared to support the sector's long-term ambitions.

3.2. Strategic Initiatives

Each strategic pillar is supported by a set of initiatives designed to advance its goals. These initiatives represent programs or interventions that directly respond to the workforce challenges identified through modelling and stakeholder engagement. Although they are not detailed implementation plans, they have been clearly defined with purpose, rationale and intended impact in mind.

To ensure clarity, alignment, and consistency across the strategy, each initiative is described using a seven-point framework, which is as follows:

- 1. What it is:** A concise description of what the initiative is and what delivery could look like
- 2. Purpose:** An explanation of the structural or cultural barrier the initiative aims to address, and how it aligns with the broader strategic pillar and national workforce priorities.
- 3. Time horizon:** An indication of whether the initiative is expected to deliver impact in the short (1 - 2 years), medium (3 - 7 years), or long term (8 - 10 years).
- 4. Key stakeholders:** The stakeholder groups that are responsible for the execution. For example, government, industry, or educational institutions.
- 5. Target Audience.** A description of the target audience group that will be affected by or benefit from the initiative. For example, this may include youth, tradespeople, educators, employers, Indigenous communities, career-changers, and others relevant to the nuclear workforce.
- 6. Key outcomes:** High-level indicators of success that can signal whether the initiative is achieving its intended impact.
- 7. Relevant Activities:** Activities that are occurring in Canada currently.







This icon is used to indicate initiatives that are relevant to new to nuclear jurisdictions.

	Short (1- 3 years)	Medium (3-7 years)	Long (8 – 10 years)
Mobility	Nuclear careers crossover pathways	Nuclear job board	Reciprocal recognition agreements
			Labour pool coordination office
Attraction and retention	Powering Canada campaign	Ambassador network	
	Experiential outreach	Succession planning	
Diversity, equity, and inclusion	Inclusive work practices	Indigenous pre-apprenticeship and mentorship programs	Localized training programs
	Young professionals	Women-in-nuclear-trades initiative	
Education and skills alignment	Nuclear foundations pathways	Industry-integrated educator development	Open educational access
	Early education and teacher engagement	Nuclear skills accord	

Figure 4. High-Level Roadmap of Initiatives by Strategic Pillars

3.2.1. Strategic Pillar 1: Mobility (Provincial and Sectoral) Initiatives

	 Nuclear career crossover pathways	 Reciprocal recognition agreements	 Labour-pool coordination office	 Nuclear job board
What it is	<p>A national program that enables mid-career professionals and individuals without traditional university credentials to transition into the nuclear workforce. This would be achieved through a mix of micro-credentials, prior learning recognition, bridging programs with nuclear-specific training, and structured onboarding.</p> <p>This initiative would require cross-sector competency mapping (e.g., safety, systems thinking, field operations), recognition of prior learning (RPL) frameworks, and bridging programs.</p>	<p>A national framework to enable mutual recognition of training, certifications, and work credentials across provinces. This initiative would formalize mobility for nuclear workers through regulator-to-regulator agreements, allowing radiation protection clearances, endorsements, and other key qualifications earned in one jurisdiction to be recognized elsewhere. It may also include a train-the-trainer satellite model to support local capacity while maintaining consistent national standards.</p>	<p>A national coordination function, housed in a neutral industry body or an existing federal body like Employment and Social Development Canada, that publishes quarterly 10-year workforce demand projections and facilitates labour-sharing agreements across provinces. This office would act as a central broker for data, planning, and interjurisdictional collaboration, helping align labour supply with forecasted project needs and reducing regional mismatches.</p>	<p>A national job board that aggregates nuclear-related employment opportunities across Canada into a single, user-friendly platform. It would serve as a central hub for job seekers, particularly those outside the traditional nuclear talent pool and enable smaller employers to post openings alongside larger players, improving visibility and accessibility across the ecosystem. Modeled on similar platforms in other specialized sectors, a government-backed board would lend credibility, improve clarity for applicants, and strengthen national coordination in recruitment.</p>
Purpose	<p>The nuclear sector faces significant entry barriers for capable workers who come from outside conventional academic pathways. This initiative addresses those barriers by formally recognizing and integrating transferable skills, expanding the definition of</p>	<p>Mobility between provinces is currently constrained by fragmented credentialing and inconsistent regulatory alignment. This initiative addresses that friction by creating portable qualifications and shared acceptance of critical safety and operational</p>	<p>Canada’s nuclear sector currently lacks long-term visibility into workforce demand, leading to reactive hiring, uneven training pipelines, and boom-bust labour cycles. This initiative addresses that gap by providing forward-looking data and coordinating labour-sharing mechanisms. It enables proactive planning and</p>	<p>Canada’s current job-posting landscape is fragmented, making it difficult for prospective workers to discover opportunities and for employers to access a broad candidate base. This initiative addresses inefficiencies in talent matching and strengthens the sector’s visibility by streamlining</p>

	readiness, and enabling faster, safer entry into nuclear careers. By targeting high-quality talent from regulated, safety-intensive industries, the initiative strengthens workforce resilience and accelerates talent deployment, without compromising the sector's safety or professionalism.	certifications. It balances national mobility with respect for local oversight, enabling improved labour movement without adding administrative burden or compromising local standards.	smoother deployment of skilled workers, particularly when local capacity is insufficient or project peaks coincide across regions.	recruitment processes across the industry.
Timeline	Short term. Program design and pilot efforts can begin within 1 - 2 years, with broader sector-wide uptake and institutional alignment taking place over time.	Long term. Initial bilateral agreements and implementation pilots can begin within 3 -5 years, with broader institutional uptake and standardization targeted by year 10 ⁷ .	Long term. Foundational data and modelling setup and stakeholder engagement could begin within 2 - 3 years, with full operational coordination and reporting in place over 6 - 10 years.	Medium term. The platform could be designed, built, and launched within 2 years and successfully taken up in the medium term
Key stakeholders	Industry, educational institutions, and government	Trained and certified nuclear workers, tradespeople, and safety personnel seeking to work across provincial lines. Also includes regulators, training bodies, and employers coordinating interprovincial labour deployment.	Industry, Government	Nuclear industry employers, CNA. CNA has a jobs board for its members, found at www.nuclearjobscanada.ca . An adjustment to this would be showcasing this jobs board more broadly and including all nuclear jobs, not only those of CNA members.

⁷ With Canada's recent announcement of Bill C-5, it is likely that this strategic element may be advanced at a faster rate, enabling workers to move more easily in jurisdictions to meet the demand of large project development.

Target audience	Mid-career workers from adjacent sectors (e.g., mining, defence, aerospace, energy), skilled tradespeople, international professionals, and candidates without four-year degrees.		Labour unions, educators, employers, workforce planners, and policymakers.	Prospective job seekers (youth, mid-career switchers, skilled trades, and professionals); workforce intermediaries (e.g., training providers, career advisors)
Key outcomes	<ul style="list-style-type: none"> ● Agility: Expands the sector’s ability to fill roles quickly by unlocking new, non-traditional talent pools and reducing barriers to workforce entry. ● Efficiency: Reduces hiring friction and maximizes use of existing national talent by formally aligning external competencies with sector needs. 			





Recent Activities

- Canadian Free Trade Initiative Chapter 7 (Labour Mobility) – effective since 2017 but updated in 2025 to remove 64% of exemptions as part of efforts to reduce interprovincial trade barriers⁸
- Labour Market Ministers taking action to improve labour mobility in Canada⁹

⁸ <https://www.canada.ca/en/intergovernmental-affairs/news/2025/02/government-of-canada-removing-more-than-half-of-federal-exceptions-to-the-canadian-free-trade-agreement-to-strengthen-interprovincial-trade.html>

⁹ <https://www.canada.ca/en/employment-social-development/news/2025/05/labour-market-ministers-taking-action-to-improve-labour-mobility-in-canada.html>




3.2.2. Strategic Pillar 2: Attraction and Retention Initiatives

	 Powering Canada campaign	 Experiential outreach	 Ambassador network	 Succession planning
What it is	A national campaign that highlights nuclear careers as purpose-driven and aligned with Canada’s climate, economic, and innovation goals. The campaign would use real voices, currently employed in the industry, to create a connection between the public and the industry. It will be delivered primarily through digital channels such as social media and video, supported by targeted outreach through schools and career influencers. Content should directly link training, entry points, and the opportunity. This campaign would also include resources such as educational activities, job profiles, aptitude testing surveys, and a link to the job board.	A set of immersive, hands-on learning experiences, such as virtual reality (VR) simulations, “try-a-trade” events, and post-secondary site tours, designed to expose students and educators to real-world nuclear environments. Tailored to local contexts (e.g. VR in rural schools or nuclear modules in STEM programs), these experiences make nuclear careers tangible, relatable, and aligned with actual job functions to build early interest and relevance.	A national network of nuclear ambassadors representing Indigenous Peoples, newcomers, visible minorities, and women in trades. These ambassadors will engage directly with students, jobseekers, and educators to reflect the sector’s diversity, showcase real career paths, and build personal connections to nuclear work. Over time, the network can evolve into a mentorship or peer-support platform, building long-term relationships across the talent pipeline.	This initiative focuses on structured career planning, leadership development, and clear advancement pathways to improve retention across the nuclear workforce. It emphasizes internal mobility, early talent identification, and succession planning, ensuring workers can see and access long-term opportunities within the sector. Programs may include development plans, rotational placements, mid-career transitions, and tiered leadership training. Tools such as the Pathways to Careers in the Canadian Nuclear Industry (PCC) model can support both workforce retention by illustrating growth opportunities across the sector. Future leaders of the nuclear industry will be empowered to build a culture for success by defining futuristic goals for the sector.
Purpose	This initiative repositions nuclear as a purpose-driven career. It plays a foundational role in building the industry’s social licence by fostering trust and transparency with	Experiential outreach addresses structural barriers to access and awareness, particularly in regions without operating facilities. It helps counter misconceptions, build early understanding of	The nuclear sector lacks visible, relatable role models from underrepresented groups and communities, limiting both career interest and perceived belonging among youth and job	Retention in the sector is limited due to unclear advancement paths, narrow role awareness, and a lack of structured leadership pipelines. By building visible, supported pathways for

	<p>communities, particularly those historically disconnected from the sector. Aligning the campaign with national values and goals will help position nuclear as a first-choice career and will strengthen the long-term relationship between the sector and the public.</p> <p>This campaign would mirror similar campaigns in other countries like the UK, France, and home-grown programs like that of the Canadians for Nuclear Energy (C4NE).</p>	<p>nuclear culture and safety, and develop foundational familiarity with technical roles. Positioned as an entry point into the workforce development pipeline, it shifts experiential learning from a marketing tool to a core component of talent readiness.</p>	<p>seekers. This initiative responds to structural underrepresentation by embedding diversity directly into outreach and engagement. It helps expand who sees themselves in the sector, while also supporting broader social licence and inclusion goals by building trust, credibility, and community alignment with the evolving workforce.</p>	<p>advancement and ensuring that experienced workers stay engaged, the workforce can capitalize on the experience built in the industry.</p> <p>As part of this initiative, early talent identification will be critical for management and leadership succession planning. This will help organizations invest in tailored development opportunities, ensuring a strong pipeline of skilled talent for long-term growth and innovation.</p>
Timeline	<p>Short term. Initial impact can be achieved within 1 - 2 years through campaign rollout, with sustained influence on public perception and talent attraction over 3 - 7 years.</p>	<p>Short term. Impact can be immediate through the deployment of experiential outreach programs, and then further developed into the medium term.</p>	<p>Medium term. Initial engagement programming to be developed and deployed by year 3, with the network expanding and potentially evolving into a mentorship model over 4 - 7 years.</p>	<p>Medium term. Planning and foundational tools can be launched within 3 years, with measurable workforce impact and succession outcomes over a 5 - 10-year period.</p>
Key stakeholders	<p>CNA, governments, industry HR and training providers</p>	<p>trade unions, universities and colleges, and employers</p>	<p>Trades unions, employers (particularly utilities), government</p>	<p>Upper management and leadership in industry, HR</p>
Target audience	<p>Youth and early-career workers, career influencers (e.g. parents, teachers, guidance counsellors), and communities with limited exposure to the sector. Secondary audiences include educators and workforce intermediaries seeking tools to guide students into high-opportunity fields.</p>	<p>High school and post-secondary students (STEM or social sciences), educators, guidance counsellors, and rural or remote communities.</p>	<p>Youth, early-career workers, educators, and job seekers from underrepresented communities, particularly Indigenous, newcomer, and equity-deserving groups.</p>	<p>Current nuclear workforce across technical and operational roles, particularly mid-career workers, early leaders, and underrepresented groups.</p>

Key outcomes	<p>Attraction:</p> <ul style="list-style-type: none">● Increases interest in nuclear pathways among new entrants and under-represented groups, particularly in trades and operational roles, by presenting the sector as modern, mission-driven, and future-ready.● Strengthens the industry’s social licence by building public trust through visible, values-based storytelling and community-aligned engagement.● Builds early engagement and interest by making nuclear careers accessible and concrete.● Encourages early skills development by boosting access to new technologies and tools can create potential early skill development where these tools may not have been available.● Strengthens visibility and trust in communities historically disconnected from the sector. <p>Retention:</p> <ul style="list-style-type: none">● Improves employee engagement and retention by demonstrating clear career growth opportunities.● Reduces turnover and succession risk through leadership development and internal mobility.● Supports a more diverse and future-ready talent pipeline.● Improve culture, more sustainable systems to promote staying in the industry.● Promotes long-term leadership development.
---------------------	---



3.2.3. Strategic Pillar 3: Diversity, Equity and Inclusion Initiatives (I)

	 Inclusive work practices	 Young professionals	 Indigenous pre-apprenticeship and mentorship programs
What it is	A sector-wide initiative to standardize inclusive hiring and workplace practices that reduce barriers and promote a positive culture. This includes actions such as anonymized resume screening, structured interviews, diverse hiring panels, and codified flexible work arrangements. This also includes consideration of remote working to reach a younger workforce and enables residents in remote regions to participate in the industry. Inclusive work practices go beyond just diverse hiring - they create an environment where everyone feels valued, respected, and empowered to contribute fully.	A sector-wide initiative to accelerate leadership development by placing early-career professionals in high-impact roles such as industry boards, technical committees, and regulatory or workforce planning bodies. These placements are designed not as mentorship or observation but will allow young professionals to make active contributions that build leadership fluency and long-term commitment to the nuclear field. The program may also include fellowships, policy residencies, or international exchanges to support export-readiness and inter-industry collaboration.	A community-partnered program that supports Indigenous participation in the nuclear workforce through pre-apprenticeship and mentorship pathways. These programs are co-designed with First Nations communities and delivered in-community, removing common barriers such as travel, childcare, and cultural disconnect. Models like the Canadian Union of Skilled Workers (CUSW) mobile training with Level 1 trade school completion, job guarantees, and dual-skilling in both trades and nuclear-relevant competencies (e.g., radiation protection), demonstrate a viable blueprint. Long-term mentorship and wraparound supports reinforce sustained career development and trust.
Purpose	By embedding inclusive practices across the employee lifecycle, the sector can reduce bias, increase representation, and improve public confidence in its workforce systems. When an organization focus on inclusive recruitment and workplace culture, it fosters long-term equity, engagement, job satisfaction, loyalty, and innovation.	As workforce competition intensifies across clean energy sectors, this initiative positions nuclear as a dynamic field where young professionals can meaningfully shape strategy, not just fill pipelines. It also reinforces the sector’s long-term viability by including new voices and adaptive thinking at the decision-making level.	This initiative addresses gaps in Indigenous representation by embedding training within Indigenous communities and aligning it with real employment opportunities at nuclear sites. It builds a long-term talent pipeline based on local priorities and respectful partnerships, drawing on proven engagement models from employers like Cameco and Orano.
Timeline	Short term. Many inclusive practices can be implemented within 1 - 2 years, with	Short term. Initial placements and policy shifts can be implemented within 1 - 2	Short to medium term. Mobile and pilot programs can be launched within 1–2 years, with permanent local training

	broader cultural shifts and policy standardization emerging over time.	years, with long-term cultural and leadership impacts over time.	infrastructure developed over a 5–7-year horizon.
Key stakeholders	HR and recruitment teams, hiring managers, communities, sector employers, and professional associations.	Nuclear operators, industry associations (e.g. CNA, OCNI), technical boards, and HR and talent teams.	Indigenous communities, education providers, employers, trades unions, government, and reactor project developers.
Target audience	HR and recruitment teams, hiring managers, communities, sector employers, and professional associations.	Youth-focused professional networks such as NAYGN, ¹⁰ which is an active and growing organization targeting young professionals in the nuclear sector.	Indigenous communities
Key outcomes	<p>Access:</p> <ul style="list-style-type: none"> Ensures hiring and advancement systems are inclusive and consistently applied, reducing bias and broadening who can enter and progress in the sector. <p>Representation:</p> <ul style="list-style-type: none"> Increases visibility and participation of diverse talent across technical, leadership, and early-career roles, contributing to a more inclusive and credible sector. Builds trusted, long-term workforce participation in skilled trades and operations roles within Indigenous communities. 		

¹⁰ <https://naygn.org/>

3.2.4. Strategic Pillar 3: Diversity, Equity and Inclusion Initiatives (II)

	 Women-In-Nuclear Trades	3.2.5.  Localized Training Programs
What it is	A dedicated program to increase the participation and retention of women in nuclear skilled trades through targeted outreach, stipends, mentorship, and wraparound supports. The model draws from successful collaborations like Women Building Futures, which significantly boosted female apprenticeship intakes in carpentry and other trades. Core components include sector-wide partnerships, paid pre-apprenticeship training, on-site mentorship, and support services like childcare and resource rooms tailored to the realities of jobsite life.	A place-based training model that delivers nuclear skills programming directly in rural and underserved communities, reducing geographic and economic barriers. Programs would be co-developed with local institutions and tailored to local industry needs (e.g., cybersecurity, environmental monitoring, lab-based work). This model draws from successful regional education partnerships and targets both initial and lifelong learning to build durable talent pipelines.
Purpose	By removing key barriers to entry (e.g. awareness, financial risk, cultural fit) and on-the-job attrition (e.g. lack of mentorship and family supports), it builds long-term participation and leadership among women in trades. It also helps reframe nuclear work as inclusive, sustainable, and aligned with Canada's broader talent and equity goals.	To reduce the need for relocation and expand access to nuclear careers in underserved regions by embedding training infrastructure closer to where people live. This supports inclusive participation, closes geographic gaps in opportunity, and strengthens long-term community-based workforce resilience.
Timeline	Medium term. Initial pilots and outreach can begin within 1 - 2 years, with broader roll-out and measurable workforce impact over 3 - 5 years.	Long term. Initiatives may begin with pilot programs and scale to full infrastructure over time, with long-term commitments to institutional partnerships and workforce development.
Key stakeholders	Trade unions, nuclear employers, training institutions, equity organizations, site managers, and government skills funding bodies.	Local colleges and training providers, provincial governments, industry workforce planners, and economic development agencies
Target audience	Women in trades (current and aspiring)	Indigenous and rural communities
Key outcomes	<p>Access: Increases women’s entry into nuclear trade roles through targeted programming and supports.</p> <p>Representation: Builds a visible and credible base of women in skilled nuclear positions, reinforcing inclusion and broadening talent pipelines.</p>	<p>Access: Expands nuclear career pathways to remote and underserved regions through flexible, community-delivered training.</p>

		<p>Representation: Increases geographic diversity of the workforce and strengthens local economic resilience by enabling people to train and work in their own community.</p>
--	--	--

Relevant Activities – Pillar 3:

- Cameco’s pilot project in partnership with the Saskatchewan Indian Institute of Technologies (SIIT) is a pre-apprentice program focused on Northern students¹¹
- OPG ION (Indigenous Opportunities Network) program was created in 2018 and is a community-centered program that recruits job-ready Indigenous people¹².
- Bruce Power’s Career Launch Program¹³ is a program to support Indigenous students in their studies that are relevant to the industry. It aligns with their STTEP (Supporting Training to Employment Pathways) and Indigenous Employment Program¹⁴.
- Women in Nuclear Canada¹⁵, although not focused on the skilled trades, is a relevant industry organization supporting women in the nuclear industry.
- Aecon Women in Trades¹⁶ program offers fully paid training, competitive wages, benefits, and career development.
- WISTEM – Women in Stem CNSC initiative¹⁷

¹¹ <https://www.cameconorth.com/community/stories/comecos-new-trades-training-program-underway-featuring-all-women-class>

¹² <https://www.opg.com/documents/indigenous-opportunities-network-ion-brochure/>

¹³ <https://www.brucepower.com/careers/student-indigenous-opportunities/#:~:text=Career%20Launch%20Program,variety%20of%20interests%20and%20skills.>



¹⁴ <https://www.brucepower.com/careers/indigenous-employment-guide/>

¹⁵ <https://womeninnuclear.com/>

¹⁶ <https://www.aecon.com/womenintrades>

¹⁷ <https://www.cnsccsn.gc.ca/eng/resources/women-in-stem/>


3.2.5. Strategic Pillar 4: Education and Skills Alignment Initiatives (I)

	Nuclear Foundation Pathways	 Early Education and Teacher Engagement	 Industry-Integrated Educator Development
What it is	A modular training system that enables nuclear-specific competencies, starting from pre-apprenticeship and progressing through stackable credentials, to be obtained by the skilled trades. The model supports learners from high school through to journey person pipelines and beyond, allowing them to upskill in line with project timelines. It combines general trades training with specialized nuclear content, such as radiation safety and nuclear safety culture, and may include dual-skilling, site-based learning, and certification tied to real-world milestones to ensure career progression and job-readiness.	A national initiative to introduce nuclear topics into elementary and high school classrooms by equipping teachers with curriculum-aligned resources, immersive learning tools, and professional development opportunities. Drawing on proven models such as the Saskatchewan Mining Association’s Minerals Connected and Geoventure programs, it would provide hands-on classroom kits, field activities, and educator training to normalize nuclear as a clean, innovative industry. The aim is to embed nuclear alongside other STEM pathways to provide greater awareness of opportunities within the industry.	A cost-shared secondment program that places college instructors and university faculty on active nuclear sites (such as SMR builds or refurbishment projects) for 6- to 12-month rotations. These placements provide hands-on exposure to evolving technologies, regulatory processes, and operational realities. For instance, an assignment at a nuclear power plant like Point Lepreau could be paired with technical collaboration elsewhere to enhance instruction in licensing and compliance ¹⁸ .
Purpose	It strengthens system alignment by linking education delivery to project timelines and workforce demand. By enabling clear end-to-end apprentice-to-journey person pathways and embedding nuclear content early, it builds a flexible, scalable model for workforce readiness that meets employer needs and supports long-term sector growth.	By engaging teachers as the first point of contact and inspiration for students, it helps normalize nuclear careers, improve public understanding, and build interest before post-secondary decisions are made.	Many educators lack experience with modern technology systems and updated regulatory processes. Embedding faculty within active project teams helps close this gap by refreshing curricula, strengthening technical credibility, and aligning academic content with actual workforce needs. It also builds a stronger relationship between academia and industry, reinforcing trust and long-term collaboration.
Timeline	Short term. Pre-apprenticeship and certification models can be developed and expanded within 1 - 2 years, with full	Short term. Pilot programming can begin within 1 - 2 years, with provincial integration and wider uptake over 3 - 5 years.	Medium term. Program design and pilot placements can begin within 2 - 3 years, with broader institutional uptake increasing over time.

¹⁸ This example was provided in an interview with a knowledgeable and experienced New Brunswick consultant.

	integration into workforce planning over 3–7 years.		
Key stakeholders	Industry training specialists, government, post-secondary institutions, skilled trades unions	Governments and industry	Industry and academic institutions.
Target audience	High school students, tradespeople, vocational learners, and mid-career workers seeking to upskill or re-enter the workforce.	Elementary and high school students, teachers, curriculum developers, and provincial education ministries. Note: A specific focus must be made for on-reserve and First Nations schooling regarding STEM education, and specifically energy as these are federally regulated.	College and university educators and curriculum designers
Key outcomes	<p>Readiness</p> <ul style="list-style-type: none"> • Ensures graduates are equipped with the technical, regulatory, and cultural competencies needed for modern nuclear roles. • Builds early literacy and comfort with nuclear concepts, fostering informed post-secondary choices and updates curriculum and instruction quality by aligning educator knowledge with industry practice <p>Responsiveness:</p> <ul style="list-style-type: none"> • Builds agile education systems that can scale and adapt to project milestones, regional needs, and emerging technologies. • Creates a future-ready talent pipeline by embedding nuclear in long-term education planning. • Improves the adaptability of training programs to reflect technology changes and project needs. 		

3.2.6. Strategic Pillar 4: Education and Skills Alignment Initiatives (II)

	Nuclear Skills Accord	 Open Educational Resources
What it is	A voluntary national agreement that standardizes nuclear training across institutions by aligning all providers to a shared set of competencies and assessment criteria. Modeled on systems like the UK’s Regulated Qualifications Framework, the proposed accord would publish a national competency map and designate an independent body to validate new courses. Micro-credentials and certifications developed under this framework will reflect sector-defined standards and be designed in partnership with labour, employers, and educators to ensure broad credibility and uptake. For the skilled trades, new credential models will be piloted through established pathways (e.g. registered apprenticeships and union-endorsed programs) to support learning flexibility without displacing core certifications like the Red Seal. The Accord aims to harmonize training quality, reduce duplication, and uphold jurisdictional and labour standards as Canada’s nuclear workforce scales and diversifies.	A national, open-access repository of nuclear training materials, including lesson plans, VR simulations, lab manuals, and assessment banks, made available under Creative Commons or similar licenses. These resources enable institutions to adopt and tailor high-quality content efficiently, supporting consistent and scalable delivery of nuclear education, particularly for smaller colleges and emerging programs.
Purpose	Canada’s nuclear training landscape is fragmented, with varying standards across institutions and a lack of coordination as SMR programs emerge. The proposed Nuclear Skills Accord addresses this by establishing sector-defined expectations for education and training, ensuring coherence and credibility across the entire learning ecosystem. By aligning providers to a common framework, it reduces course development duplication and enables shared validation of curricula.	By enabling shared use of vetted lesson plans, assessments, and digital tools, it lowers development barriers and supports consistent, scalable delivery. It is particularly valuable for smaller institutions and new program entrants, allowing them to launch or expand nuclear offerings without duplicating effort.
Timeline	Medium term. Initial convening and standards mapping can occur within by 3 years, with broader institutional adoption and national validation processes developed over time.	Medium to long term. A functional platform could be developed within 3 - 5 years, with expansion, content

		contributions, and integration into education systems occurring over a 5 - 10-year period.
Key stakeholders	Colleges, universities, regulators, reactor vendors, employers, and credentialing bodies.	Governments, curriculum developers, educational institutions developing nuclear content, and training partners across both public and private sectors.
Target audience	Colleges, universities, trades unions and credentialing bodies.	Post-secondary instructors, elementary and secondary school teachers, and post-secondary instructors.
Key outcomes	<ul style="list-style-type: none"> ● Readiness: Ensures graduates meet shared industry expectations, improving job alignment and onboarding. ● Responsiveness: Reduces fragmentation and duplication in program development by enabling coordinated, sector-wide course validation and faster adaptation to workforce needs. 	<ul style="list-style-type: none"> ● Readiness: Ensures more learners can access job-aligned training regardless of where they study, strengthening graduate preparedness across the sector. ● Responsiveness: Enables institutions to quickly launch or expand nuclear programs in response to emerging demand, without being constrained by content development timelines.

Relevant Activities:

- Ontario Tech University Nuclear Career Accelerator Program¹⁹ ; Nuclear Innovation Institute – Energy Co-op Program²⁰
- Calgary Construction Association’s Honour the Work program²¹ includes early education learning kits that could be leveraged for developing skilled trades
- Saskatchewan Mining Association’s Minerals Connected program²² has several resources for teachers, including research kits and lesson plans. They are developing a Uranium research kit.
- Ontario Tech University and Humber Polytechnic partnership to power the future of the nuclear energy workforce²³

¹⁹ <https://ontariotechu.ca/programs/continuous-learning/engineering/nuclear-career-accelerator-program/index.php>

²⁰ <https://www.nuclearinnovationinstitute.ca/workforce-development>

²¹ <https://cgyca.com/membership/honour-the-work/>

²² <https://saskmining.ca/minerals-connected/teacher-resources>

²³ <https://ontariotechu.ca/president/driving-impact/powering-the-future-of-the-nuclear-energy-workforce/index.php>

- SaskDLC Resource Bank hosts a variety of Hubs that are custom resource centers where groups can create and share collections associated with a project or organization²⁴
- CNL, AECL and UNENE to establish the Canadian Nuclear Learning Centre to coordinate education, training, knowledge management, and workforce development across the Canadian nuclear sector.²⁵

²⁴ <https://resourcebank.ca/>

²⁵ <https://www.cnl.ca/canadian-nuclear-laboratories-atomic-energy-of-canada-limited-and-the-university-network-of-excellence-in-nuclear-engineering-to-establish-the-canadian-nuclear-learning-centre/>

4. Additional Considerations for New-to-Nuclear Jurisdictions

The expansion of nuclear programs into provinces and territories that do not currently have a nuclear program will present additional challenges related to recruiting, training, and retaining the resources required to staff a new nuclear program. The International Atomic Energy Agency (IAEA) document “Human Resource Management for New Nuclear Power Programmes” provides a framework for developing a Human Resource Management (HRM) strategy²⁶ in countries pursuing new nuclear programs. While the target of the guide is countries developing an HRM strategy at a national level, much of the framework can be applied to a new-to-nuclear province or territory.

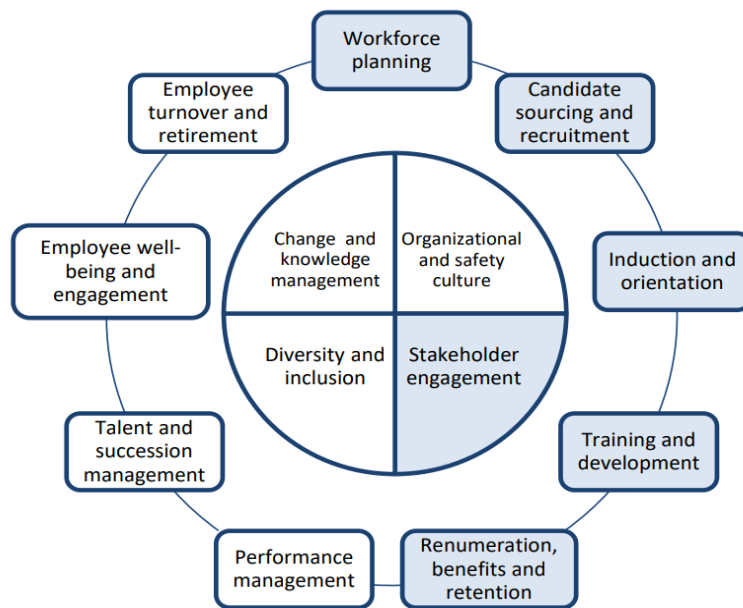


Figure 5: Elements of the IAEA’s HRM Strategy for new nuclear programs

4.1. Workforce Planning

Initiating a new nuclear program will require a detailed understanding of the resources needed over time. This includes an assessment of the competencies, quality of experience, and the number of staff needed at each phase of the new nuclear program. A skills-based approach, unlike a traditional approach that might rely heavily on degrees and past job titles, may be useful for workforce planning focused on current project needs, with attention on upskilling and reskilling to facilitate employee growth and internal movement.

Many roles in the nuclear industry require higher levels of education, job-specific training, and years of experience to meet the qualifications. The time between recruitment and a fully qualified, independent

²⁶ <https://www.iaea.org/publications/8488/workforce-planning-for-new-nuclear-power-programmes>

nuclear professional may be 5-10 years or more for certain positions. Workforce planning must account for this lead time to ensure a ready supply of talent when needed.

4.2. Recruitment

Recruiting involves identifying job specifications, including education and experience requirements, and potential sources of candidates. For a new-to-nuclear province or territory, many of the specific qualifications identified during the workforce planning phase may not be available locally; however, using a skills-based approach, associated skills and competencies may be abundant. For example, transferable skills from industries such as Alberta and Saskatchewan's petrochemical and mining sectors, or from other highly regulated industries such as aerospace and food and drug, could be transitioned to nuclear energy projects. Other considerations in the recruitment phase include the engagement of students and educational and vocational institutions, and the recruitment or secondment of experienced nuclear professionals from provinces or countries with established nuclear programs. Figure 6.6 highlights the potential sources of new staff to be considered for the development of a new nuclear program.

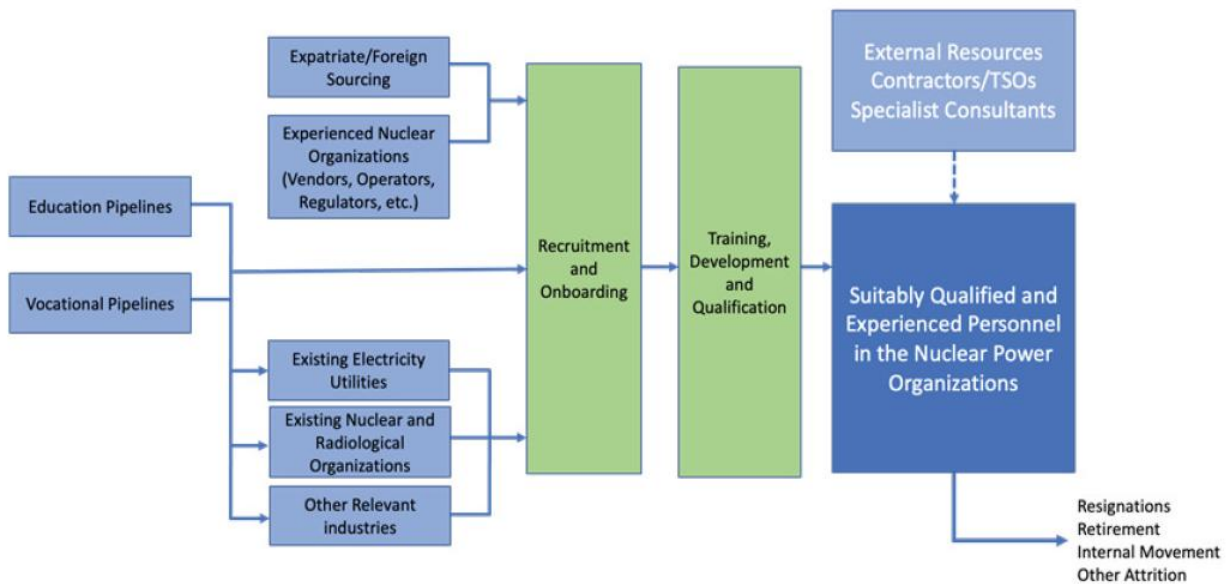


Figure 6. Recruitment Sourcing and Staffing Lifecycle

Many elements of the recruitment lifecycle shown in Figure 6 align with the 6B decision framework for talent acquisition. This model helps organizations align their workforce with their business goals and provides a structured approach to address workforce and skills gaps.

The 6Bs are:

- Buy: Hiring new talent from outside of the organization.
- Build: Developing talent within the organization, which would align with a skills-based approach.
- Borrow: Obtaining outside talent through consulting, outsourcing or contingent labour to access skills and capabilities.
- Bind: Retaining critical employees.
- Bounce: Removing underperformers, eliminating unproductive roles, or up-skilling employees with 'old' skill sets.
- Balance: Developing an appropriate combination and balance of all other approaches.

For new-to-nuclear provinces and territories, it is also important to note that candidates must meet stringent requirements for background screening, security clearance and fitness for duty. Following recruitment, there are additional requirements for induction, onboarding and indoctrination training.

4.3. Education, Training and Development

Many roles in the nuclear industry require higher levels of training, education, and specific experience. It is important to begin outreach early to inform educational institutions (both professional/graduate and vocational/technical) and students about the opportunities in the nuclear industry and the skills required. Developing new skill-based education programs (or modifying/enhancing similar existing provincial programs) will require a significant investment and lead time. It is recommended that a new-to-nuclear province leverage the experience and knowledge base of existing nationally available programs when considering future domestic educational needs.

Within an owner/operator organization, numerous sources of training will be required at all phases of developing a new nuclear program and will continue through commissioning and operation. It is important to establish a culture of nuclear safety, security, and safeguards from the earliest stages of development, as these form the basis of the training programs in all subsequent phases. Organizations will need to develop formal training programs based on the scope of required training, identifying sources of training, location of a training centre and staff authorization requirements (i.e. formal recognition by the owner/operator and regulating body that an individual is competent and authorized to perform his/her tasks, such as an Authorized Nuclear Operator). Following recruitment and induction, all workers will require introductory training in nuclear fundamentals, followed by job-specific training that may involve years of formal training, mentoring/job shadowing and, in some cases, demonstration of competence to perform the job. This approximate timeline is shown below in Figure 7.

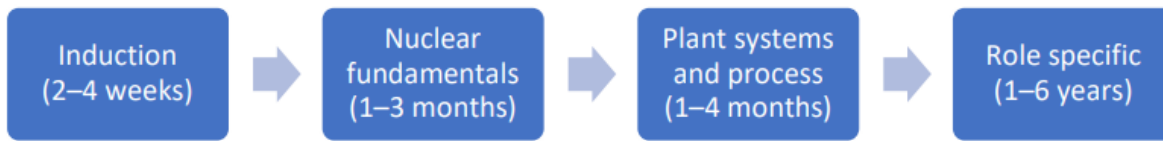


Figure 7: Durations of Typical Onboarding and Training Programs.

Additional Sources of training and knowledge transfer may include:

- Hiring of experienced nuclear professionals (nationally and internationally) to transfer skills and experience to new nuclear staff developed within the province
- Secondment of staff to other provinces with established nuclear programs
- Vendor support included in bid specification and contract negotiations. This may include the transfer of technical and training materials to the owner/operator, or direct training of operators and other key personnel.
- On-the-job operations training at a reference plant location
- Formal out-of-province or international training opportunities
- Systematic Approach to Training (SAT), including simulation of control rooms and models of plant systems

4.4. Remuneration, Benefits and Retention

To attract provincial resources and the new generation of talent entering education programs to the nuclear industry, organizations in new-to-nuclear provinces will need to ensure remuneration is competitive with other industries in the province (for example, oil and gas or mining in Alberta and Saskatchewan). This may include both financial and non-financial rewards such as benefits, transportation, education, and subsidized housing. Sponsoring students' education as a means of future recruitment should be considered (albeit with a minimum year of service clause to improve retention).

Loss of personnel can be costly in the nuclear industry compared to other industries due to the higher investment in training and the longer lead time required to replace a specialized role. Therefore, a staff retention and succession planning strategy is important for mitigating this risk. Competitive pay and benefits are key elements of employee retention and should be continuously monitored against trends in provincial and national industries. Internally, providing clear development and career paths and ensuring that remuneration remains consistent across employees with similar roles and experience can help improve retention. Turnover of staff and the success of the implemented retention strategies should be continuously monitored for trends and updated as necessary.

4.5. Stakeholder Engagement

Stakeholder engagement is a fundamental part of a workforce planning strategy in a new-to-nuclear jurisdiction from the earliest phases of development through the lifecycle of an operating facility. Early alignment with key stakeholders, including (but not limited to) Indigenous communities, educational institutions and students, labour groups, regulators, and government, is crucial for building public trust and ensuring that a growing provincial workforce is available at each stage of development. This will include communication regarding career opportunities, nuclear safety standards, and economic benefits within the province. Special attention should be given to Indigenous communities when establishing mutually beneficial partnerships and identifying clear training to employment pathways.

Engaging the next generation is important for the long-term establishment of nuclear in a jurisdiction. Nuclear power plants (NPPs) are multi-generational, which means that knowledge management and succession planning are essential considerations from the initiation of a nuclear program through the duration of the lifecycle of the NPP. There are many ways to engage young professionals, including mentoring, job shadowing, in addition to formal training and relationship-building programs.

5. Conclusions

Canada's nuclear industry stands at a pivotal juncture, with an aging workforce, advancing technologies, and a growing demand for clean, reliable energy driving the need for robust workforce development strategies. This study has illustrated that while Canada possesses a strong foundation of technical expertise and institutional knowledge, a coordinated and forward-looking approach is essential to address emerging challenges and opportunities.

The expansion of nuclear through life-extension projects, large-scale refurbishments, and the deployment of new reactors is generating demand for skilled trades, licensed operators, technologists, engineers, and regulatory professionals at a pace not seen in decades. This demand is further complicated by demographic pressures, including retirements, and an increasingly competitive labour market shared with other critical sectors.

Stakeholders- including industry, governments, Indigenous communities, unions, post-secondary institutions, and professional associations- are taking important steps to modernize training pathways, integrate equity and diversity principles, and align workforce planning with long-term energy strategies. However, gaps remain in coordination across jurisdictions, in attracting young and underrepresented groups, and in clearly mapping career pathways into the sector.

To ensure a resilient and inclusive nuclear workforce, Canada must continue to invest in interprovincial collaboration, education-to-employment pipelines, Indigenous engagement, and targeted upskilling and reskilling programs. Strong public-private partnerships and consistent national leadership will be crucial to sustaining the human capacity necessary for Canada's future.

The findings of this workforce study underscore the urgency of aligning workforce planning with Canada's climate goals and energy security needs, and of securing project commitments and public support to meet them. If acted upon with intention and foresight, the nuclear sector can serve not only as a pillar in Canada's clean energy transition but also as a model for inclusive, strategic workforce development in the 21st century.

Appendix A: Overview of Core Roles in Nuclear

Occupation	Educational requirement	How long does it typically take to develop those skills?	What sectors use this occupation?	In the nuclear workforce, where and when is this occupation needed?
Engineers	University degree (4 years)	A junior engineer <4 years of experience, intermediate 5-10 years, senior 10-20 years. Principal engineer 20+ years.	All sectors	Engineers are needed across the entire span of the nuclear workforce from mining to fuel production, operations to waste management and decommissioning
Trades	Apprenticeship (On-the-Job) and In-School May be combined with a college program, depending on the trade	Typically, 2-5 years (~60% of apprentices finish in <4 years) Typically, 4 years for carpenter/mechanic/electrician/boilermaker, 5 years for plumber/electrician/pipefitter	All sectors	Trades are needed across the entire span of the nuclear workforce. However, the type and quantity of trades vary widely depending on the stage of development.
Radiation Protection	College diploma (2 years) or on-the-job training	A contamination monitor can complete on-the-job training with no formal college programming. A radiation surveyor must complete advanced radiation protection training either through a college program or an on-the-job training/education program.	Mining, Nuclear operations	Radiation Protection staff are needed across the span of the nuclear workforce.
Scientists	University degree (Bachelor's- 4 years, Masters- 2 years, PhD-4+ years)	A junior scientist <4 years experience, intermediate 5-10 years, senior 10-20 years. Principal scientist 20+ years. The role of the individual will vary depending on the need within the organization. A PhD-level scientist is required in some research and development work, whereas an undergraduate-level degree is adequate for field-level work.	All sectors	Scientists are needed across the entire span of the nuclear workforce from mining to fuel production, operations to waste management and decommissioning. Scientists play a vital role in regulatory and licensing, research and development.

Technicians and Technologists	College diploma (2-3 years)	<p><1 year entry level</p> <p>1-3 years of independent work</p> <p>3-5+ years lead technologist</p> <p>Co-op placements during school can significantly speed up skill development and job readiness</p>	All sectors	Technologists/technicians are needed across the entire span of the nuclear workforce, from mining to fuel production, operations to waste management and decommissioning. They play an important role in research and development.
Licensed operations staff	<p>College diploma (2-3 years) in a technical field such as power engineering, instrumentation and control, or nuclear technology. Some employers do require a university degree in engineering or a related science field</p> <p>Employer-sponsored training (18-30 months)</p>	<p>Following the completion of the employer-sponsored training, becoming a licensed nuclear operator requires examination by the CNSC; the total time to acquire a license is 2-3 years after hire.</p> <p>Shift supervisors and senior authorized operations require additional training and certification (can take 6-8+ years)</p>	Nuclear energy	Nuclear operations, refurbishment, and decommissioning